

February, 2008

Review of the Gippsland November 2007 Flood Response (report)

Neil Dufty

**Review of the
Gippsland November
2007 Flood Response**



MOLINO STEWART
INTEGRATED SUSTAINABLE SOLUTIONS



Final Report



Review of the Gippsland November 2007 Flood Response

REPORT

for

The Victoria State Emergency Service

by

Molino Stewart Pty Ltd

ACN 067 774 332

FEBRUARY 2008

CONTENTS

1 EXECUTIVE SUMMARY	1
2 INTRODUCTION	3
2.1 Background	3
2.2 The Project	5
2.3 Objectives	5
2.4 Scope	6
2.5 This Report	6
3 METHODOLOGY	7
3.1 Approach	7
3.2 Focus Groups	7
3.3 Resident Surveys	7
3.4 VICSES and other stakeholder interviews	8
3.5 Limitations	8
4 FINDINGS	10
4.1 Flood awareness	10
4.2 Preparedness	11
4.3 Information dissemination	11
4.4 Influence of warnings and information flow	12
4.5 VICSES profile and roles	14
4.6 The FloodSmart education program	15
5 DISCUSSION	18
5.1 Understanding local communities	18
5.2 Community education during the event	19
5.3 Flood education planning	19
5.4 Total warning systems	20
5.5 Driving in floodwater	20
5.6 Media	20
6 CONCLUSION AND RECOMMENDATIONS	22
6.1 Conclusion	22
6.2 Recommendations	22
7 REFERENCES	24

APPENDICES

- Appendix A Focus Group Questions
- Appendix B Resident Survey Questions
- Appendix C Agency Staff Interview Questions

LIST OF FIGURES

- Figure 1 Map of the Gippsland area affected by the June 2007 flood event 4

1 EXECUTIVE SUMMARY

Areas of Gippsland in Eastern Victoria were flooded both in June/July 2007 and again in November 2007. These re-flooded areas included the neighbouring townships of Tinamba and Newry. Molino Stewart Pty Ltd was engaged by the Victoria State Emergency Service (VICSES) to investigate any differences between the awareness, preparedness and response of these communities to the two flood events. As part of the study it was asked to review the effectiveness and appropriateness of a community flood education program, titled 'FloodSmart', delivered by VICSES after the June Flood and also as a temporary program just prior to, and during the November Flood.

To conduct the study, Molino Stewart surveyed residents in both communities, held a focus group in each, and interviewed VICSES and other agency staff involved in the flood event.

In the study, Molino Stewart found differences between the two townships in their awareness of the flood risk. Tinamba, that has experienced more regular flooding, was very aware of the flood risk and generally felt that flooding was 'inevitable'. Newry, on the other hand, generally believed that their flooding was largely caused by the 'management' of the upstream Glenmaggie Dam. There appeared to have been a slight increase in flood awareness in Newry compared to that surveyed just after the June Flood.

The FloodSmart education program, delivered in the two phases, appears to have greatly improved preparedness in both communities, especially evidenced by the increase in the number of people developing flood emergency plans since the June Flood. The delivery of the FloodSmart program during the November event was groundbreaking and appears to have reinforced the previous education program in the townships, further built the adaptive capabilities of both communities and helped people respond appropriately during the Flood. The only exception to this impact was the little community support for the recommendation to evacuate issued by VICSES during the November event.

The communities and agencies believed that VICSES was better prepared and responded better in the November Flood. This was largely due to improvements made both on-ground and institutionally by the agency since the June Flood.

As a result of the study, improvements still need to be made to flood warning systems for the two communities, in improving the local VICSES media presence and in further building the capabilities of especially Newry to adapt to future flooding. FloodSmart also needs to be further refined, both for before and during a flood event, and expanded throughout flood prone communities in Victoria.

Six specific recommendations were made from the study for VICSES.

1. Continue FloodSmart education, especially in Newry, through the development of a local flood education plan linked to Wellington Shire Council's flood sub-plan.
2. Further improve flood warning systems in conjunction with the BOM and Southern Rural Water, especially in relation to the reliability of gauges, developing real time rainfall runoff modelling, refining phone warnings and encouraging more community participation in flood warning.
3. Further refine the FloodSmart education program based on the findings of this report for use just prior to and during a flood event, where the opportunity arises.
4. Amalgamate a flood education plan component into the FloodSmart program to help ensure long-term impacts of community education and community ownership of their flood education.

5. Seek to train and deploy media personnel to flood areas to improve the profile of VICSES and 'manage' the media messages and information, especially in television coverage.
6. Better integrate the 'community education' and 'media' functions of VICSES locally, regionally and centrally.

It should be noted that these recommendations cannot be properly addressed with current VICSES resources and therefore require additional funding support.

2 INTRODUCTION

2.1 Background

Substantial flooding occurred in the Gippsland region in late June, 2007, causing widespread damage. Flood warnings were issued by the Bureau of Meteorology (BOM) for twelve rivers in south east Victoria as well as Traralgon Creek and Gippsland Lakes. The Victoria State Emergency Service (VICSES) and Police also advised people to evacuate in some locations.

Warnings of major flooding were issued for the Macalister, Mitchell, Avon, Thomson and Snowy Rivers and for Traralgon Creek. Warnings of moderate flooding were issued for the Tambo, Buchan and Latrobe Rivers. Minor flood warnings were issued for the Nicholson, Bemm, Genoa and Cann Rivers. General flood warnings were also issued for the Gippsland Lakes, into which all these rivers flow. Some rivers in South Gippsland, namely the Powlett River and the Merrimans, Bruthen and Bodmans Creeks were also affected by flooding.

Outflows from Lake Glenmaggie on the Macalister River have been estimated to be equivalent to a 1 in 105 event which is the largest flood to have been recorded on the river. Inflows to the Lake, however, would have far exceeded this as it was only half full at the time of the flood but upstream rain and stream gauges were swept away by the floods.

Heavy rain also fell in the Gippsland region in early November 2007. This caused the potential for substantial flooding, particularly along the Macalister River, where inflows into Lake Glenmaggie reached 68,500 megalitres per day on 4 November. To accommodate these inputs, Southern Rural Water was releasing up to 59,150 megalitres per day down the River, placing the neighbouring townships of Newry and Tinamba (located in Figure 1) on high flood alert.

Floodwaters started to subside during 5 November. According to an Australian Broadcasting Commission (ABC) report (5/11/07), 'The SES said reports from Tinamba indicated that there was some water in the street of the town, but no houses had been inundated. In nearby Newry, there was a lot of water in paddocks around the township, but the town itself was largely dry.' There was far less damage especially to Newry properties in the November 2007 Flood than the June 2007 Flood, when 33 homes and businesses in the township were inundated.

Research into the June 2007 Flood suggests that especially the Newry community was poorly prepared for that flood. According to Molino Stewart (2007a), the flood risks for Newry, 'were poorly understood by the community.' As a result, warning systems generally failed the community.

Since the June 2007 Flood, VICSES and other agencies, have taken action to improve warning systems, their emergency response and community preparedness. A main focus of these actions by VICSES has been the delivery of community flood education in Newry, Tinamba and other flood prone communities in Gippsland. This community education, branded as the 'FloodSmart Program', was conducted initially between the two floods, and then as a temporary program just prior to, and during the November 2007 Flood resulting from BOM predictions.

As the Gippsland floods affected the same communities within a four month interval, there is a unique opportunity to compare agency and community preparedness and response in relation to both flood events. There is also an opportunity to gauge the impact of initiatives, such as the FloodSmart program, that were implemented after the June 2007 Flood.

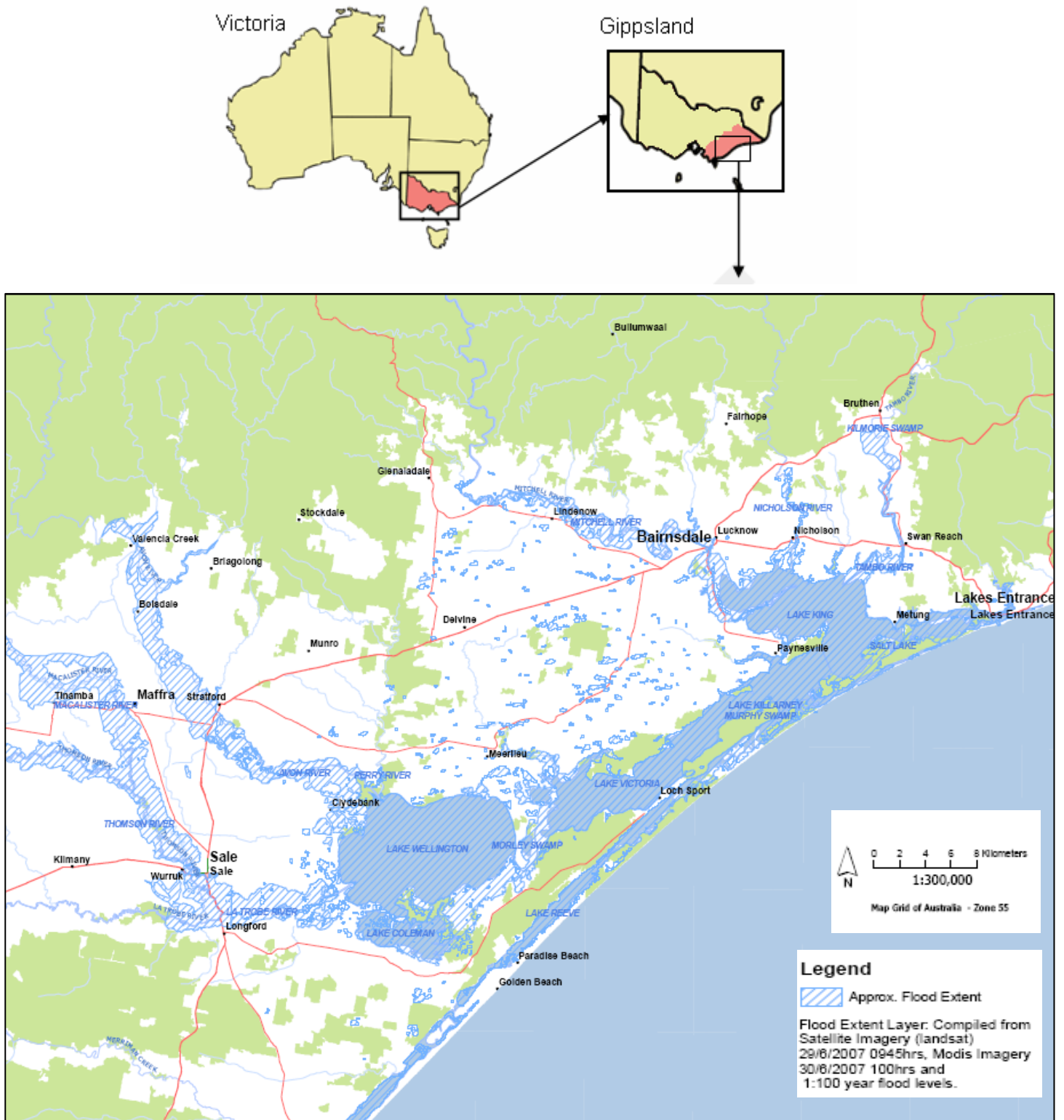


Figure 1 Map of the Gippsland area affected by the June 2007 flood event

Source: State of Victoria, Department of Sustainability and the Environment, 2007, Gippsland Floods Public Map

2.2 The Project

VICSES is the control agency for flood emergencies in Victoria. It instigates 24-hour flood warning dissemination services to relevant local and regional authorities during major floods. VICSES is also responsible for coordinating evacuation during floods.

VICSES wishes to use the opportunity of the two floods in the same area to investigate whether there have been improvements in preparedness and response related to the two events. It would especially like to research the impact of its community education ('FloodSmart') activities in helping communities prepare and respond to the Gippsland November 2007 Flood.

VICSES engaged the services of Molino Stewart Pty Ltd, a consultancy specialising in floodplain management and flood education, to conduct this research.

2.3 Objectives

The objectives of this project are to:

- Compare the flood response between the June 07 event and November event
- Identify flood knowledge and awareness of residents prior to, during and post event
- Identify differences in the way the community was prepared, between the events
- Identify information dissemination tools, and make comparisons between events
- Review how the warnings and information flow influenced resident preparedness, decision making and behaviour, and make comparisons between events
- Establish the key differences in terms of community perception, VICSES pre-event and event response and community education between the two events and what caused such differences
- Review the success or otherwise of the FloodSmart product in engaging the communities of Tinamba and Newry and make recommendations on improvements
- Ascertain whether the current FloodSmart/StormSmart program addresses the rural needs and identify what improvements need to be made based on qualitative feedback from interview
- Make recommendations on how to improve community preparedness and how best to implement the FloodSmart program immediately prior to potential flood events.

VICSES would also like to ascertain information in relation to the affected communities, specifically:

- Residents' understanding of the flood threat prior to the incident
- Comparison of preparedness between the two events including both the affect recent flooding has had on motivations and the effect of the FloodSmart elements
- The influence of prior education/experience on preparedness and decision making behaviour
- How warnings influenced behaviour and decision making

- What actions were undertaken to prepare
- Whether people intended to leave their homes, and what were the influencing factors and triggers for this decision
- How residents perceived VICSES and the information/advice provided by VICSES and how this compares to the June Flood experience.

2.4 Scope

The project was limited to the review of the activities in both flood events that took place in Tinamba and Newry.

2.5 This Report

This report presents the results of the review carried out by Molino Stewart based on the project objectives and focus listed in Section 2.3. It describes the methodology used in the review in Section 3 and the findings of the review in Section 4. Section 5 includes a discussion of the impact of VICSES initiatives such as the FloodSmart Program. Section 6 of the report provides VICSES with recommendations to improve its preparedness and response activities.

3 METHODOLOGY

3.1 Approach

A 'social research' approach was used to conduct the review. This involved the use of three methods:

1. Focus groups
2. Resident surveys
3. Interviews with relevant agency staff, especially from VICSES.

The results of each of the social research methods are integrated and compared in Section 4 and further discussed in Section 5.

The social research was conducted mainly in December 2007, with some stakeholder interviews carried out in January 2008.

3.2 Focus Groups

Focus groups enable researchers to find 'depth' in reviewing community responses as opposed to more empirical methods e.g. surveying. They also allow participants to use group dynamics to voice their views - they may not be as confident to voice these views individually in interviews or surveys. A weakness of focus groups can be that a few people may dominate with their views if this is not countered by appropriate facilitation.

Two focus groups were held with Neil Dufty of Molino Stewart as facilitator for both. The Newry focus group was held on Wednesday 5 December 2007, commencing at 12 noon. The Tinamba focus group was also held on Wednesday 5 December, commencing at 7PM. The Tinamba focus group was integrated into the monthly meeting of the Tinamba Community Representative Group (CRG) which consists of representatives of residents and business in the township, as well as rural landholders from the surrounding farms.

Twenty people participated in the Newry focus group and twelve people in the Tinamba focus group. Both these participation levels should be viewed as significant, given that there are only about 30 properties in each township.

The questions used in the focus groups are provided in Appendix A.

3.3 Resident Surveys

Surveys were distributed in both communities to obtain personal views related mainly to 'closed' questions, thus enabling some 'quantitative' insight into community flood-related actions and views.

Seventy surveys were distributed to residents and business owners, both in person at the focus groups and through the respective local stores. A reply paid envelope was provided with the surveys to allow for mailing of the completed surveys back to Molino Stewart. This technique was used as it was found by Molino Stewart in previous surveying in Newry (see Molino Stewart 2007a) that face-to-face surveying was ineffective as most townfolk were not at home during the day.

Eight completed surveys were received from both Newry and nine from Tinamba – 17 responses in total. The results of this surveying are found in Section 4.

The survey questions are provided in Appendix B.

3.4 VICSES and other stakeholder interviews

During December 2007 and January 2008, Molino Stewart conducted phone interviews with a range of key agency staff to ascertain their views regarding warnings, responses and the impact of the FloodSmart Program. The following VICSES staff were interviewed:

- Director of Operations
- Manager State Operations (State Co-ordinator)
- State Duty Officer (Nov 2 – 4)
- East Region Duty Officer (Nov 2 – 4) (Incident Controller)
- Manager, Community Education (Information Unit Leader ECC Nov 4 - 6)
- ICC Community Flood Facilitator
- Emergency Management Services Project Officer
- Manager, Public Relations

A staff member (the Incident Manager) from Southern Rural Water was also interviewed.

The interview questions are provided in Appendix C.

3.5 Limitations

There are a few limitations to the three-pronged social research approach used in this review that should be noted.

Firstly, the small number of surveys received, albeit a reasonable sample size of a small population (17 surveys from 60 properties), limits the opportunity for the quantitative description of results. The results can only be treated indicatively and thus described in a more qualitative way. This means that instead of reporting survey results as percentages they will be described more as trends e.g. 'most respondents from Newry said.....' Furthermore, with more people attending the focus groups than were surveyed, there is a bias anyway towards the more qualitative way of describing results in Section 4.

Secondly, there is limited opportunity to compare the results of the surveying of residents regarding the June 2007 Flood (Molino Stewart 2007a) with the November survey results. This is because the June Flood surveying was more widespread across Gippsland, with only 15 surveys received from Newry. Where possible, the responses from the June Flood surveying in Newry were compared with the eight responses received in this review. No Tinamba residents were surveyed after the June Flood.

Thirdly, it should be noted that the survey results of both this and the previous June Flood are dependent on 'self-reporting' by respondents. There was no opportunity to validate responses, although in this November Flood review the use of the focus groups and observations of the ICC Community Officer who was assisting residents during the flood, acted as ways to validate general community responses.

Fourthly, this report, based on the project objectives in Section 2.3, has a focus that is slightly different to that commissioned for the Gippsland June 2007 Flood Review. A main focus of the previous Molino Stewart review was on the operation of flood warning systems whereas this review's primary focus was on the impact of the FloodSmart

program on community preparedness and response. However, there are questions consistent to both surveys where comparisons can be made, especially in Newry as this community was surveyed in relation to both floods.

Lastly, it should be noted that the review focuses almost totally on the views of residents and businesses within the townships of Newry and Tinamba – it only touched on the views of farmers through a few of these attending the focus groups. Differences in viewpoints between townfolk and rural landholders are discussed in Section 4.1.

4 FINDINGS

4.1 Flood awareness

Just over half the respondents from both communities said they had experienced a flood before the June 2007 Flood. Most of those were long term residents of Newry or Tinamba and had seen floods in these areas before.

Before the June 2007 Flood, the majority of survey respondents believed that there was only 'some chance' or 'no chance' of their property being flooded. This was particularly evident from the responses from Newry, whereas residents from Tinamba seemed to believe there was a higher chance that they would be flooded.

Before the November 2007 Flood, community awareness had changed slightly with more residents believing that was 'some chance' of their property flooding. There was again a contrast in answers from Newry and Tinamba. Most Newry residents thought they now had at least 'some chance' of their property being flooded – two surveyed still believed there was 'no chance' of their property being flooded in November. Responses from Tinamba were more divided about their chance of being flooded in November 2007, although no one thought there was 'no chance' of being flooded.

This general trend in flood awareness in the two communities is supported by the focus groups. There was a general belief in the Tinamba group that flooding in the township is 'inevitable' and related to the need to retain water in Lake Glenmaggie for irrigation purposes and the natural occurrence of torrential rain events. On the other hand, the Newry focus group generally appeared to believe that the flooding was primarily connected to 'excessive' levels in the Lake and the apparent 'slow response' by Southern Rural Water in releasing water when a flood downstream appears imminent. In short, they felt their flooding should be minimal and be largely 'controlled' by water supply authorities.

Southern Rural Water stated that while they received regular updates and excellent access to the best information available on predicted rainfall from the BOM, the actual rainfall that occurred exceeded what was expected during the event. Should the predicted rainfall and runoff scenarios have occurred, then the reservoir would most likely only have just filled, with releases below minor flood levels.

Although only a few rural landholders participated in the focus groups, they generally believed that flooding was a 'necessary evil'. They supported keeping Lake Glenmaggie as full as possible for irrigation purposes and to guard against drought. Although flooding could be devastating to them - several reporting extensive damage to fences and outbuildings in the November Flood – the benefits of a regular water supply outweighed its impact.

Almost all respondents in both communities did not believe that the November Flood would threaten their personal safety when they first thought their property might flood. One respondent in Tinamba, though, thought it was going to be 'life threatening'. This result is significantly different in Newry than for the June Flood when two of the respondents thought the flood would be 'life threatening' (Molino Stewart 2007a).

Respondents were split on whether or not they thought the November Flood would threaten their property or possessions. However, of those who thought their property or possessions were under threat, most believed it was only a 'minor' threat.

The respondents were also asked what they thought the chances of getting flooded in the future would be. The opinion across the two communities was split - most either saying that there is 'some chance' or that there is a 'high chance' that they would be flooded in the future. Amazingly, after two floods within four months, two people in Newry said there was 'no chance' of their property being flooded in the future. Although

the responses in Newry were varied, the general response in Tinamba was that a flood in the future is 'inevitable'.

4.2 Preparedness

From the survey responses and focus groups, it appears that preparedness levels have increased significantly in Newry since the June Flood. Most residents (seven out of eight) in Newry from this survey believed that they were not at all well prepared for the June Flood. This is consistent with the findings of the June Flood survey where 80 percent of Newry residents thought they were 'not prepared at all' (Molino Stewart 2007a). On the other hand, before the November Flood all Newry respondents believed that they were 'moderately well' to 'extremely well' prepared for flooding. No one said they were not at all well prepared. This improvement in preparedness is consistent with the Newry focus group discussion.

Most of the survey respondents from Tinamba said that they were 'extremely well' prepared for the June Flood, as well as for the November Flood. From the focus group, the Tinamba community prides itself on being well-prepared for flooding with its own procedures 'carried out with SES support in a systematic way related to flood warnings'.

Before the June Flood, most people in the two communities reported that they did not have a flood emergency plan for their premises. In Newry, no respondents had a flood emergency plan before June, while four the respondents from Tinamba did have one.

Before the November Flood, almost all (15 out of 17) respondents from both communities did have a flood emergency plan. In the time between the floods all but one Newry respondent developed an emergency plan. It appears from community discussion and the focus groups that, although there is heightened 'anxiety' from the June Flood, the FloodSmart education program is an important factor in the development of these home emergency plans.

Agency staff interviewed generally believed that both communities were better prepared for the November Flood than the June Flood. This view was gleaned mainly from feedback from the communities just after the November Flood and from the large proportion of residents that attended the Tinamba community meeting with home emergency plans and other FloodSmart products.

Not only were the communities better prepared, but VICSES also appeared to be better prepared. This was the perception of both community focus groups and of all agency staff interviewed. In the flood-affected communities, from all accounts, VICSES was better coordinated and provided more effective support in November than in June.

4.3 Information dissemination

The majority of survey respondents indicated that during the November Flood their preferred means of receiving flood warnings and other flood information was either via a telephone call from the Flood Wardens or on the radio. Some people also indicated that they received additional information from VICSES doorknocks, from neighbours, from the Tinamba community meeting and from the community bulletins posted at the local stores and hotels. Radio was much the preferred option for receiving flood information with Newry respondents.

This trend for preferred information sources is similar to that for Gippsland communities surveyed in relation to the June Flood (Molino Stewart 2007a). From this survey, 45 percent of all people surveyed went to the radio for further information. Other information sources included television, from the internet, from neighbours and from phoning the SES flood information line.

It appears with that both communities primarily used the local information sources (e.g. doorknocks, community meeting, community bulletins) available in the November Flood, mainly as a result of the FloodSmart program.

Radio remained the preferred way of receiving flood information. Both focus groups praised Gippsland ABC Radio for providing continual updates including flood warnings and road closure information. On the other hand, they felt the commercial radio stations need to be more proactive in providing regular flood information.

The majority of respondents attempted to check the information or get more information about the possibility of flooding during the November event. This is similar to the June Flood where the majority (76 percent) searched for more information about the possibility of flooding (Molino Stewart 2007a). As in the June Flood, radio was seen as the most trusted source of information for the November Flood. Flood wardens and community bulletins were also cited as trusted flood information sources in the November Flood.

Both focus groups commented on the 'sensationalised' coverage of the November Flood by television stations. Not only did they feel the reporting was generally inaccurate about the extent and impact of local flooding but also provided 'poor messages' about appropriate behaviour e.g. a reporter standing in floodwater at the Tinamba roundabout. Some VICSES staff and the focus groups also noted that television did not report on the important recovery phase in the two Gippsland Floods – as soon as the flood peak the television crews were gone. The role of the media in flood events is further discussed in Section 5.

People surveyed were split on whether or not they thought they received enough information from VICSES during the November flood - just over half the respondents said they did receive enough information from the SES. Results were similar for both Newry and Tinamba.

At VICSES headquarters, there was a communication plan, further developed from learnings from the July Flood that was activated for the Gippsland communities impacted in November. The communication plan was apparently better scripted in relation to triggers for the November Flood.

4.4 Influence of warnings and information flow

Almost all those people surveyed found the flood warnings and other flood for the November flood was 'easy' or 'very easy' to understand. This is consistent with the findings for the June Flood where '78 percent felt that the flood warnings were easy to very easy to understand' (Molino Stewart 2007a).

Almost all survey respondents in both townships thought that the provision of flood warnings was better in the November Flood than the June Flood. The reasons given were mostly that they had better warning of the flood through receiving more information and through FloodSmart initiatives such as the community meeting and community bulletins. This view was confirmed through the focus groups.

The Molino Stewart report on the June Flood noted that, 'Only two people in Newry expressed satisfaction with the warning system with most being extremely dissatisfied'. More Newry respondents expressed satisfaction with the warning system in the November Flood, although still half were still 'dissatisfied' with it.

When asked what or who made them first think it might flood in November, the responses were spread over several options. The most common response was that the heavy rain made them think it might flood; many respondents also cited radio broadcasts and friends, neighbours or relatives letting them know.

When asked if they warned other people about the November flood, most people said they did and those people warned family and neighbours mostly. Not as many people in Tinamba warned other people about the flood than in Newry.

The majority of people said they heard the Flood Warning issued for the Macalister River during the November Flood and about half of those people thought it applied to them. On the other hand, most of the respondents did not hear the Flood Watch for West Gippsland and only one person thought it applied to them. The hearing of the Flood Warning has improved in comparison to the June Flood, when less than half (41 percent) of respondents heard the Flood Warning for the Macalister River and 61 percent thought it applied to them (Molino Stewart 2007a). The hearing of the Flood Watch is lower in November, as in June 38 percent heard it and 58 percent thought it applied to them (Molino Stewart 2007a).

Of the people who received BOM flood warnings or related information in the November Flood, the majority said it helped them prepare and respond to the flood. Most said it helped them take early action and to be better prepared. This is a similar result to that for the June Flood when roughly 75 percent found the BOM flood warnings and related information to be useful (Molino Stewart 2007a).

Almost all people (16 out of 17) surveyed said that they took some action to protect their property as a result of flood warnings and other information they received. The most popular actions were raising household items and sandbagging (especially in Tinamba). Most people with pets kept them inside with them during the November Flood. Some moved their pets to higher ground while others left them where they were as they didn't perceive any immediate threat to their wellbeing. The majority of people left their vehicles where they were during the November Flood (e.g. in carport, side of road). People from Newry were more likely to put belongings in the car and move it to higher ground, nearly all respondents from Tinamba left their car where it was.

Most people said that they did at some point walk or drive through floodwaters during the November Flood. Some people said they did so to check on animals and livestock, some claimed it was the only way to safety and others walked or drove through floodwaters to go to the local hotel or shop. One person said they did it to go to work; another went to visit her husband in hospital while another respondent was digging trenches to get the water to flow easier through their property.

Just less than half (seven out of 17) of the respondents said they heard the 'evacuation order' (a recommendation to evacuate) issued by VICSES on the Sunday of the November Flood, at around 4PM. Most people who did hear the 'evacuation order' stayed put and either sandbagged or waited until it was 'really time to leave'.

No people from Tinamba evacuated in the November Flood according to the survey results and the focus group. Three people in Newry said that they evacuated, but this was prior to the 'evacuation order'. It also should be noted that two people in the Newry focus group said that their families had not returned to their homes in November, as the homes were still be repaired after damage caused by the June Flood.

The main reasons for not evacuating were disbelief that their building would flood, not enough threat to personal safety and knowing how to manage in a flood event. The three Newry residents that did evacuate cited danger to their personal safety as the main reason for this action.

Most people in both communities said that they would do nothing different if a similar event to that of the November Flood were to occur again. Two respondents from Newry stated that they would evacuate next flood event, although they had not in the past.

There was a general view from Southern Rural Water and VICSES that the warning system for Tinamba and Newry worked far better in the November than the June event. This was assisted by a meeting between Southern Rural Water, VIC Police, VICSES and BOM to discuss and further document roles and responsibilities and improve the notification procedure for all areas downstream of Lake Glenmaggie. Critical rain and

stream flow gauges remained in operation through the November event, whereas several key gauges were washed away in June. Furthermore, Southern Rural Water is working with the BOM on further rainfall gauges in the Macalister catchment which will assist with the prediction and management of future events. There was also a better understanding of the flooding impacts of different flow rates on downstream communities, including an estimate that approximately 60,000 ML/day could inundate Newry.

Southern Rural Water believes that the key area for future improvement is through the rainfall-runoff analysis and interpretation (subsequently calibrated by gauged stream flow response) and communication of the advice to knowledgeable sources in each agency which in turn can assess the appropriate response and take prompt action.

In the Macalister catchment, the value of early lead analysis – especially going into the evening - is critical. According to Southern Rural Water, historically it only takes 10 to 15 hours from commencement of a rising leg of the hydrograph to peak – this may have dramatically shortened after the bushfires. This timeframe is really ‘quite tight’ for community or even agency response, especially as one needs some initial time to interpret the rainfall and catchment response, and make judgements as to warnings.

Some VICSES staff believed that the warning system for Newry and Tinamba still requires improvement. The technical elements of the warning system such as the phone tree needs further refining e.g. through possible uses of SMS messaging. There possibly needs to be better mapping of areas of inundation and the introduction of the coloured zones of flood affectation as used in the Benalla FloodSmart pilot should be investigated. More community participation in flood warning was also suggested e.g. the use of upstream ‘flood watchers’ recommended in the Molino Stewart (2007a) report.

There is also a need to further build community resilience to flooding in both communities, but more so for Newry. This is further discussed in Section 5. This includes learning how to most effectively interact with agency advice

4.5 VICSES profile and roles

The majority of survey respondents thought that the assistance from VICSES was better in the November Flood than in the June Flood. Several respondents said they attended community meeting run by the SES or saw community bulletins at local shops, hotels and service stations. A few also said that the SES helped them with sandbagging.

The focus groups offered ‘better VICSES internal coordination’ and the ‘implementation FloodSmart education program’ as the main reasons for the improved profile of the agency. The Tinamba focus group felt that VICSES did an ‘excellent job’ in both floods, especially in on-ground support (e.g. sandbagging) and the dissemination of flood information. On the other hand, the Newry focus group believed the VICSES performance in the June Flood was generally poor in providing assistance but improved significantly in the November Flood.

The role of the Country Fire Association (CFA) in assisting VICSES in the flood response was acknowledged by both townships. It appears that the local CFA units were better guided in the response through the pager system with VICSES in the November Flood than the June Flood. Local CFA representatives did note problems with apparent slowness in erecting ‘road closure’ signs in both floods which caused motorists to be stranded between floodwaters and, in one case, needed to be rescued from being in floodwaters. This issue is further discussed in Section 5.

4.6 The FloodSmart education program

The FloodSmart community education program was implemented in the Tinamba and Newry in three phases.

1. After the June Flood. Throughout the two months after the June Flood, a 'clipped' version of the FloodSmart program that was being trialled in Benalla was rolled out. VICSES employed a Community Flood Facilitator to disseminate FloodSmart products to the communities through doorknocking, community meetings and a network of community leaders that he developed. Ongoing media coverage and FloodSmart-related additions to the VICSES supported this initiative.
2. Just prior to and during the November Flood. Triggered by the possibility of flooding in early November, the VICSES Community Flood Facilitator returned to Tinamba and Newry. He conducted a doorknock to further distribute FloodSmart products to residents and businesses and advise them of impending weather and appropriate actions they could take. He also provided the FloodSmart products to Southern Rural Water staff.

As the flood risk increased, the Community Flood Facilitator organised a community meeting at Tinamba. It was held at 11am on 4 November. About 70 people attended the meeting with presentations from Southern Rural Water and VICSES. Wellington Shire Council and VIC Police were also represented at the meeting. There was significant media coverage of the event.

A community distribution system was developed, including a phone tree, for FloodSmart products and messages. The community distribution system included Tinamba Hotel and General Store, Newry Hotel and General Store and the Newry Fire Brigade. The local CFA were engaged to help distribute the FloodSmart products and messages.

FloodSmart community bulletins were updated generally on a three hourly basis, unless events otherwise necessitated urgent information being distributed to affected communities. The bulletins were faxed through the community distribution system.

3. After the November Flood. Follow up visits to Tinamba and Newry were conducted by the VICSES Community Education Manager and the Community Flood Facilitator, to obtain feedback on the effectiveness of the FloodSmart program, its products and messages and how it could be improved.

In relation to the first phase of FloodSmart, the majority (15 out of 17) of people surveyed claimed they received the FloodSmart products after the June Flood. Most of these people found the FloodSmart products 'useful' in helping prepare for the November Flood. Only two people (in Newry) found them to be 'useless'.

The Tinamba focus group confirmed that the Community Flood Facilitator had presented at a meeting of the Tinamba Community Representative Group (CRG) and distributed FloodSmart products at this meeting. Most survey respondents received the FloodSmart products after the June flood through doorknocking and at the local general store.

The focus groups believed that the flip charts and Action Guides were the most useful of the FloodSmart products. As a result of these products, most of the people surveyed had prepared flood emergency plans before the November Flood (see Section 4.3).

Although not given great prominence by the focus groups, it appears that developing a network of community leaders was very helpful to disseminate the FloodSmart messages and products. This is further discussed in Section 5. Focus group participants recalled some post-June flood media with FloodSmart messages and believed this supported the 'main thrust' of FloodSmart – the products and messages.

No focus group participants accessed FloodSmart information through the website after the June Flood.

All agency staff interviewed also believed that the FloodSmart program delivered just after the June Flood helped to prepare the communities for the November Flood. Some felt that it also raised confidence in VICSES and confirmed its role as the lead emergency agency for flooding. Several agency staff noted that many people attending the Tinamba community meeting during the November Flood had bought the FloodSmart products with them. This could be seen as an indicator of the acceptance of the FloodSmart products, especially the flipchart actions and emergency plan.

Focus group participants from Tinamba also found the FloodSmart program just prior to and during the November Flood to be useful in helping their preparations for the flood. The Tinamba residents found the community meeting to be very informative and the presentation by Southern Rural Water to be especially useful in understanding the potential flood extent and impact. The Newry participants felt that they were excluded from the community because many said they were not invited or believed the meeting was only for Tinamba. Apparently only four Newry residents attended the community meeting. This issue is further discussed in Section 5.

Focus group participants from both communities again felt that the FloodSmart Action Kits were the most useful of the program delivered during the November Flood. They reiterated the usefulness of the flipchart and Action Guide in helping them prepare as the floodwaters were rising.

The community bulletins were also viewed as an effective tool to disseminate flood information and advice. The Newry shop even highlighted the bulletins on a noticeboard and confirmed they were regularly read. Apparently many of the readers were travellers who used the bulletins to plan their journeys around the floodwaters.

The doorknock was seen by the focus groups as good 'public relations for VICSES' and another way to discuss preparations for the flood. The Community Flood Facilitator was praised especially by the Newry focus group for his work in helping allay the anxiety of residents and provide practical preparedness advice.

As discussed above, the media updates were seen as an important way for the communities to receive flood updates and warnings. Only one person surveyed accessed the VICSES and BOM website for flood information. One person from the Newry focus group accessed the Flood Information Line.

The community distribution system seemed to work well according to the focus group meetings. It was confirmed that the FloodSmart products and messages were distributed through community leaders and networks. The phone tree was activated but appears to be more effective in the rural (out-of-town) areas.

All agency staff interviewed believed that the use of the FloodSmart program, just prior to and during the November Flood to be very useful in helping the communities prepare and to confirm the role of VICSES in the flood event. This view was gained through observation by the Community Flood Facilitator, feedback from the communities after the flood and from anecdotes.

The community meeting, the Action Kits and the community bulletins were identified by agency staff as the most effective components of the FloodSmart program during the flood. Several staff noted that the timing of the FloodSmart program was very good - the intervention commenced just after a flood appeared likely - as there was only a small lead time of approximately seven hours before flooding.

Agency staff believed that the FloodSmart program was generally well implemented within the AIIMS structure, mainly by providing community context for the flood information issued (e.g. 'people knew what the information meant for them') and by providing community mechanisms for the distribution of updates e.g. through the community distribution system, including the community bulletins. Several improvements to the fit with AIIMS were suggested and included the need to raise the

importance of media and community education in conjunction with operations, the need to brief other agencies involved in AIIMS on the community education program and the need for consistency of messages and languages issued through AIIMS with the FloodSmart program

Other improvements to the FloodSmart program gleaned from community and agency staff responses are discussed in Section 5.

5 DISCUSSION

Several issues arising from the findings in Section 4 are discussed below. Improvements to the warning systems, community education, media and VICSES planning are also identified below.

5.1 Understanding local communities

Through the focus groups, informal discussion with community members and agency staff interviews, it became clear that Tinamba and Newry, although in close proximity, are very different in terms of their adaptive capacity or 'resilience'.

Tinamba has most of the hallmarks of being a very resilient community. It has developed strong networks and leadership structures, including through the Tinamba Community Representative Group initiated by Wellington Shire Council. This Group is attempting to solve its own community problems e.g. applying for funding to mitigate impacts of flooding in the township.

Tinamba has the experience of being regularly flooded and prides itself on the ability to self-organise its response to a flood with the support of agencies such as VICSES and the CFA. It can recover quickly through its self-help mechanisms.

Tinamba may need to formally learn to improve its flood planning and operational procedures (e.g. through a de-brief meeting) to demonstrate all the components of resilience – planning, resistance, recovery and improvement. Furthermore, it may only be resilient up to a certain flood height- the June Flood, about a 1-in-100 year event appeared to severely test its 'flood plan'.

Newry, on the other hand, is more vulnerable to the impacts of flooding as shown in the June Flood. In the June event, although it was 'poorly warned' about the flood by the agencies (Molino Stewart 2007a), it had no community flood plan nor the systems and networks to respond together. The community still appears to be traumatised from the experience. Note that, at the time of writing, Newry had no Community Representative Group.

Through the Community Flood Facilitator some response and coping networks were built in the Newry community prior to the November Flood. This helped the community prepare and respond better in this event than the June Flood. There is still effort required to improve the resilience of the Newry community based on learnings from the two recent flood events. In particular, there is a need to improve the 'adaptive capability' (competencies and systems) of the community. This could include the commencement of a Newry Community Representative Group (note that this could occur as a sequel to the focus group facilitated by Molino Stewart in conjunction with Helen Montague of Wellington Shire Council).

Understanding communities is a critical first step in any community education program. It provides context for the design of effective education programs tailored to local needs. It also provides a guide to how to develop community participation.

It is apparent that there was generally a very good understanding of the two communities, their similarities and differences, in designing and implementing the FloodSmart program by VICSES. If possible, there should be more community participation in this design to enable more ownership of the local content, implementation and evaluation.

The need for detailed community understanding in education program designing through community participation is exemplified especially in the Tinamba community meeting discussed in Section 4. There were a few comments from the Tinamba focus

group that they found the idea of a community meeting run by agencies to be 'patronising', as they already knew what they would do in the flood event. As reported in Section 4, they generally felt the community meeting to be useful in helping them prepare.

On the other hand, Newry, the more vulnerable community, felt ostracised by not having the community meeting in their township. Although separated by only a few kilometres, there appears to be some 'competition' between the townships and it cannot be assumed that Newry will automatically attend a Tinamba meeting and visa versa. Based on this community understanding, it may have been more effective to hold the community meeting in Newry, or both townships, if time permitted.

5.2 Community education during the event

The use of a community flood education program during a flood event is highly innovative. To this author's knowledge it has not been used elsewhere in Australia, and most probably the world.

From the findings in Section 4, it appears that the use of the FloodSmart program just prior to and during the November Flood was effective in helping people carry out 'last minute' preparations for the flood. It helped many of them to understand the information provided to them e.g. Flood Warnings. It does not appear to have encouraged people to evacuate, even after VICSES suggested that they should do so.

In terms of improvements, further effort should be taken to explain the 'evacuation order' as a strong request to evacuate and the importance to safety of evacuating. The FloodSmart products appear to be very useful in preparing communities, especially the flip chart, but more work needs to be done to align the Action Guide to other flood prone communities and have this ready for a flood in that area. The community distribution system, generally was effective, but a better understanding of both communities through community participation could have improved results e.g. the number of Newry people that attended the Tinamba community meeting.

As a result of this relatively successful trial, it appears that there is merit in introducing the FloodSmart program in the same way in future flood events where there is a reasonable lag time between the rain event and the flood event. It could be particularly effective along rivers in Victoria where there can be at least a day before inundation. The use of the FloodSmart program in this way would not be appropriate for situations where there is little time for flood warning e.g. flash flooding in Melbourne.

5.3 Flood education planning

At this stage, whilst still in development, the FloodSmart program is being designed to be a robust education program, with both generic and locally specific elements. Several of the VICSES staff believed it should be expanded across Victoria's flood prone communities. They also felt that it should be developed into a more long term program in these communities.

This last comment raises a deficiency of the FloodSmart program in its current guise. It is a good intervention or 'campaign' i.e. it is delivered over a short-term but most likely will have a reasonably short-term gain in uptake. There is therefore a need to extend the program over an extended period of time, with community participation.

Molino Stewart (2007b) has suggested to VICSES that the best way to ensure long term implementation of Floodsmart with community participation is through the development of local flood education plans. Based on Section 5.1, in Newry and Tinamba this could be delivered through their Community Representative Groups (hopefully Newry will

have a CRG), with support from VICSES, Southern Rural Water and Wellington Shire Council. Funding should be sought by VICSES to support this process.

5.4 Total warning systems

Both the focus groups and some VICSES staff noted that the warning systems relating to Tinamba and Newry need to be further refined as a result of intelligence obtained from both floods. There is an overall need to embrace the concept of 'total warning systems'.

Specific suggestions for improvement are:

1. The upstream gauges. There needs to be more gauges and/or alternative ways to gather warning data such as community 'flood watchers' in the upper catchment and through rainfall data models.
2. Phone tree warning system. Improved techniques (e.g. SMS messages) for warning people via phone need to be explored.
3. Community education and media. See comments in this section.
4. Flood zones. Based on the mapping of potential inundation areas, zones of affectation need to be identified and delivered through the FloodSmart program, in line with the 'Benalla model'. Funding should be sought by VICSES to support this process.

5.5 Driving in floodwater

From both focus groups, a major local issue identified was people, generally travellers, driving through floodwaters.

In Newry, there was concern about slowness of authorities to erect road closure signs in and around the township. In Tinamba, 'sightseers' were apparently ignoring road closure signs and driving through floodwaters in the township. The wake from the vehicles was adding to the risk of properties and buildings being inundated.

Apart from faster erection of road closure signs and the enforcing of these signs in the townships, community bulletins were seen by the focus groups as ways to proactively inform travellers of the flood risk (although this may not deter sightseers). One VICSES staff member suggested that these bulletins should be shown to travellers in surrounding towns (e.g. Maffra, Sale, Bairnsdale, Traralgon) to warn them of the floodwaters.

It was also suggested by a VICSES staff member that the VICSES media releases should focus more on the message that 'floods are not fun' and, in that message, warn travellers and potential sightseers to stay well away from the flooded areas for their safety and to minimise other problems such as added inundation from the wake of vehicles.

5.6 Media

As noted above, the focus groups praised ABC Radio Gippsland for its regular updates. These were obviously fed well to the radio station through the VICSES communication plan. There still needs to be effort by VICSES to 'partner' with commercial radio regarding the provision of flood information as several focus group members noted that they only listen to commercial channels

As also mentioned in Section 4, the focus groups were concerned about the 'sensational', and usually inaccurate, reporting of the flood situation on television. Several television images showed inappropriate behaviours in a flood e.g. a reporter paddling in a canoe to interview stranded landholders, another standing in floodwaters at the Tinamba roundabout. To counter this, a few agency staff believed that VICSES needs to be more 'proactive' in working with television reporters to highlight appropriate behaviours and provide factual information about the flood, including the lead role of VICSES.

Most of the VICSES media items for the November Flood were generated from Melbourne headquarters. Seventy five media items that mentioned VICSES were generated in November compared to about 780 for the June Flood (VICSES Media Summary, 3 November 2007 Flood). A few VICSES staff believed that more media could have been generated in November by having a media trained VICSES staff member or volunteer in the Gippsland area. This person could also liaise further with television reporters in relation to accurate reporting and appropriate messages.

Furthermore, it is apparent from comments that there is an urgent need for community education and the media to be better integrated, both centrally and in affected communities. Community education helps people learn to build their resilience to flooding: the media informs them of the flood situation to support these learnings. Obviously, people need accurate media reports in a flood event to 'trigger' their learnings (e.g. preparations, appropriate flood behaviours) from community education.

From agency comments, it appears that the media and the community education should be better melded into the operational activities under the AIIMs structure. On-ground, where possible, community educators and media personnel should be deployed to flooding areas and work together to both educate and inform communities.

6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

In general, the Tinamba and Newry communities appeared to respond better to the November Flood than the June Flood. It appears that the agencies (VICSES, Southern Rural Water and the Bureau of Meteorology) were more aware of 'trigger points' for inundation of the townships than for the June 2007 Flood and communicated this warning information more effectively to residents.

There was a feeling in Newry gleaned from the focus group, that in fact the agencies appeared to be 'over anxious' about the November Flood, possibly to improve their performance from the June Flood response. They believed that this anxiety could 'freak out' especially older residents. The focus group did acknowledge that this agency approach was preferred to the 'lack of support' for the June Flood.

It appears that the FloodSmart community education program helped raise people's awareness of flood risks (in Newry, more so than Tinamba) but especially helped most people in both communities to plan for and respond appropriately to flooding. The use of the FloodSmart program just prior to and during the November Flood appears to have been very effective in reinforcing previous flood education (post-June Flood) and providing a distribution system for flood information. There was strong support from VICSES staff to expand the FloodSmart program into other flood prone communities in Victoria and to investigate ways to ensure that it has long lasting impact in these communities. However, staff also highlighted that this could not be achieved by VICSES with its current resources.

It is critical that robust flood preparedness and response systems and competencies are continued to be built, both within VICSES and in the Tinamba and Newry townships and surrounds. For example, in VICSES there is a continued need to improve local media messages and to integrate community education with media activities, both on-ground and within the AIIMS operations.

In building the adaptive capabilities of the two communities it is important to understand their existing competencies and social systems. In Tinamba, effort should be made to help them learn from the two recent floods and, with VICSES, review their 'flood plan'. In Newry, effort should be made to continue to build leadership systems, such as the Community Representative Group, and through them develop a community flood plan in align with the Shire's sub-plan.

6.2 Recommendations

Based on the findings (Section 4) and the discussion (Section 5) in this report, the following specific recommendations are made to VICSES in addition to those in Section 6.1.

1. Continue FloodSmart education, especially in Newry, through the development of a local flood education plan linked to Wellington Shire Council's flood sub-plan.
2. Further improve flood warning systems in conjunction with the BOM and Southern Rural Water, especially in relation to the reliability of gauges, developing real time rainfall runoff modelling, refining phone warnings and encouraging more community participation in flood warning.
3. Further refine the FloodSmart education program based on the findings of this report for use just prior to and during a flood, where the opportunity arises.

4. Amalgamate a flood education plan component into the FloodSmart program to help ensure long-term impacts of community education and community ownership of their flood education.
5. Seek to train and deploy media personnel to flood areas to improve the profile of VICSES and 'manage' the media messages and information, especially in television coverage.
6. Better integrate the 'community education' and 'media' functions of VICSES locally, regionally and centrally.

It should be noted that these recommendations cannot be properly addressed with current VICSES resources and therefore require additional funding support.

7 REFERENCES

ABC Report (5/11/2007), *Gippsland flood threat eases*, ABC Gippsland, sourced from www.abc.net.au/gippsland/stories/s2081355.htm

Molino Stewart (2007a), *Gippsland Flood Warning Case Study*, a report commissioned by VICSES on the Gippsland June/July 2007 Flood

Molino Stewart (2007b), *Roles and Responsibilities for VICSES in Flood Education*, a report commissioned by VICSES

VICSES Media Summary: *Gippsland Floods 3 November 2007*

Appendix A
Focus Group Questions

2007 November Gippsland Flood Review Focus Group Questions

1. ICEBREAKER. Please each tell me briefly about your experiences in the June flood and the November flood

2. Do you think you were better prepared for November flood than the June flood? YES/NO (probe for reasons)

3. Did you hear the evacuation order issued by the SES on the Sunday at 4PM? YES/NO (if yes, probe for how clear the order was to understand, what actions they took and why, how order could be better communicated in future)

4. What was your perception of the SES after the June flood? Has it improved since this flood? YES/NO (probe for reasons for answer)

5. SES carried out a FloodSmart education program in your community between the two floods (provide details) How useful was this program in helping you prepare for the November flood? (probe for if it met the needs of farmers and how it could be improved for them)

6. How effective were these parts of the education program in helping people prepare for flooding before the November flood?

-developing a network of community members

- Floodsmart products e.g. Flip charts, brochures, Action Guides, magnets (show samples)

- FloodSmart website

- Media coverage (radio, newspaper)

7. How could each of these education activities be improved to better prepare communities for flooding? (probe especially for farmers)

8. The SES also carried out some FloodSmart education activities in your community just prior to, during and after the November flood (provide details). How useful were these activities in you preparing for flooding and responding to flood warnings?

9. How effective were the following activities in helping you prepare for and respond to the flood? (probe for whether each was used and did they prompt action)

- **FloodSmart Action Kits**
- **SES doorknock to advise of potential flood and provide preparation advice**
- **Media releases (e.g. radio)**
- **Website updates**
- **Community meeting in Tinamba**
- **Community distribution system e.g. phone tree**
- **Flood and Storm Information Line (1300 SES or another line?)**
- **FloodSmart Community Bulletins in hotels, general stores and service stations**

10. How could each of these education activities be improved to help communities prepare for and respond to flooding?

11. How could the FloodSmart program be improved to help communities such as yours prepare for and respond to flooding?

Appendix B
Resident Survey Questions

November 2007 Gippsland Flood Response Evaluation Survey

DATE _____

TOWN _____

STREET ADDRESS (optional) _____

1. Before June 2007, what did you think the chance of your property being flooded would be?

Only one answer permitted

- a. No Chance
- b. Some Chance
- c. Even Chance
- d. High Chance
- e. Inevitable

2. Before November 2007, what did you think the chance of your property being flooded would be?

Only one answer permitted

- a. No Chance
- b. Some Chance
- c. Even Chance
- d. High Chance
- e. Inevitable

3. How well do you think you were prepared for flooding before the June flood?

Only one answer permitted

- 1. Not at all
- 2. Slightly
- 3. Moderately well
- 4. Very well
- 5. Extremely well

4. How well do you think you were prepared for flooding before the November flood?

Only one answer permitted

- 1. Not at all
- 2. Slightly
- 3. Moderately well
- 4. Very well
- 5. Extremely well

5. Which of the following FloodSmart education activities did you receive from the SES after the June 2007 flood and before the November flood?

More than one answer permitted.

- a. I received nothing
- b. Face-to-face advice from an SES officer
- c. Fridge flip charts
- d. Brochures
- e. Action Guides
- f. Media coverage (radio, newspaper)
- g. FloodSmart Action bag
- h. Community meeting
- i. Doorknock by the SES
- j. Magnets

6. How did you receive the FloodSmart activities and information?

If Yes to 5 - More than one answer permitted.

- a. From an SES officer
- b. Community meeting
- c. Door Knock
- d. Letter box drop
- e. Local shop/business
- f. From Local Council
- g. From Southern Rural Water
- h. Other way (please specify)

7. How useful do you think the FloodSmart education program was in helping you prepare for the November flood?

Rate satisfaction on scale of 1 to 5

- 1. Extremely useful
- 2.
- 3. Useful
- 4.
- 5. Useless

8. Before the June flood did you have a flood emergency plan for your premises?

- a. Yes
- b. No

9. Before the November flood did you have a flood emergency plan for your premises?

- a. Yes
- b. No

10. What or who first made you think you might be flooded in November?

Only one answer permitted.

- a. Radio Broadcasts involving Bureau of Meteorology forecasters.....
- b. Other Radio broadcasts.....
- c. Television.....
- d. Bureau of Meteorology website.....
- e. other websites.....
- f. Friend/Neighbour/ Relative.....
- g. Door knock by SES or others.....
- h. Heavy Rain.....
- i. Saw flood waters.....
- j. Other way (please specify).....

11. Did you try and check the information or get more information about the possibility of flooding in November?

If "Yes", note where they got information. Multiple answers permitted.

- a. Yes.....
 - How did you try?**
 - i. Radio.....
 - ii. Television.....
 - iii. Friend/neighbour/relative.....
 - iv. Internet.....
 - v. SES.....
 - vi. Flood Information Line.....
 - vii. Other (Note who).....
- b. No.....

12. What information did you believe and why?

Write responses below.

13. When you first thought your property might flood in November, did you think the flood would threaten your personal safety?

- a. Yes.....
 - How much?**
 - i. Minor threat.....
 - ii. Moderate threat.....
 - iii. Significant threat.....
 - iv. Life threatening.....
- b. No.....

14. When you first thought your property might flood in November, did you think the flood would threaten your property or possessions?

- a. Yes.....
 - How much?**

- i. Minor threat.....
- ii. Moderate threat.....
- iii. Significant threat.....
- iv. Severe threat.....
- b. No.....

15. Did you do any of the following to reduce the potential damages of flooding to your property and possessions in the November flood?

More than one answer permitted.

- a. Place valuables in waterproof containers or bags.....
- b. Lift contents to higher levels.....
- c. Lift carpets.....
- d. Remove valuables from the premises.....
- e. Block points at which water could enter the building.....
- f. Other actions (specify).....

16. Did you warn other people about the flood?

- a. Yes.....
- b. No.....

If yes, who?

If Yes, more than one answer permitted.

- 1. Family.....
- 2. Friends.....
- 3. Neighbours.....
- 4. Others (specify).....

17. Did you hear the evacuation order that was issued by the SES on the Sunday of the November flood at around 4PM?

- a. Yes.....
- b. No.....

If yes, what did you do after hearing the evacuation order?

.....

18 . Did you receive information about the flood from the FloodSmart Community Bulletin?

- a. Yes.....
- b. No.....

If so, how did you receive the FloodSmart Community Bulletin information during the November flood?

More than one answer permitted.

- a. . At the local shop or hotel.....
- b. On the Internet.....
- c. On the radio.....
- d. Other way (specify).....

19. Did you receive enough information about the flood from the SES?

- a. Yes
- b. No

20. In November, did any part of your land flood?

- a. Yes
- b. No

21. Did you evacuate from your premises during the November storm?

Respondents may answer both parts of this question if more than one person on the premises during the flood. Otherwise answer only either section a or section b

- a. Yes

Why?

Multiple answers permissible

- i. Firmly believed the building would flood
- ii. Threat to personal safety
- iii. Cautious person – better to be safe than sorry
- iv. Had to look after others (partner/dependents/pets)
- v. Persuaded to leave by others
- vi. Other (specify)

- b. No

Why Not?

Multiple answers permissible

- i. Did not believe building would flood
- ii. Not a great enough threat to personal safety
- iii. Knew how to manage
- iv. Stayed to help emergency service work
- v. Stayed to look after other people
- vi. Stayed to protect property or possessions from floodwaters
- vii. Stayed to protect property or possessions from looters
- viii. It was more dangerous outside
- ix. Did not have transport
- x. Did not know where to go
- xi. Others talked me into staying
- xii. Other (specify)

22. If you stayed within your building in the November flood, what actions did you take to ensure that you and others were safe?

Write responses below.

23. Did you at any stage walk or drive through the floodwaters in the November flood?

- a. Yes
- b. No

If yes, why?

Write responses below.

24. What did you do with your pets (if any) during the November flood?

Write responses below.

25. What did you do with your vehicle during the November flood?

Write responses below.

26. Please read through the warnings which were issued during the November flood and recall whether you heard them and if you thought they applied to you:

Note whether they heard warning and if they thought it applied

- | | Heard it | It applied |
|---|--------------------------|--------------------------|
| a. Flood watch for West Gippsland..... | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Flood warnings for the Macallister River | <input type="checkbox"/> | <input type="checkbox"/> |

27. If you received Bureau of Meteorology Flood Warnings or related information in the November flood did it help you to prepare for and respond to the flood?

- a. Yes
- b. No

If yes, how?.....

28. How satisfied are you with the flood warning service you received in the November flood?

Rate satisfaction on scale of 1 to 5

- 1. Extremely dissatisfied.....
- 2.....
- 3.....
- 4.....
- 5. Extremely satisfied

29. How easy were the flood warnings to understand in the November flood?

Rate satisfaction on scale of 1 to 5

- 1. Very difficult.....
- 2.
- 3.
- 4.
- 5. Very easy

30. Do you think the provision of flood warnings was better in November flood than the June flood?

- a. Yes
- b. No

Write reasons for answers below.

31. What do you think the chance of your property being flooded in the future would be?

Only one answer permitted

- a. No Chance.....
- b. Some Chance.....
- c. Even Chance.....
- d. High Chance.....
- e. Inevitable.....

32. If a similar storm occurred again what would you do differently?

Write responses below.

33. Please indicate your preferred means of receiving flood warnings and flood related information

more than one answer permitted

- a. Radio.....
- b. Television.....
- c. Internet.....
- d. Fax.....
- e. SMS.....
- f. Email.....
- g. Face to face contact with Flood Response (eg: VICSES/Police) staff.....
- h. Telephone call from Flood Response (eg: VICSES/Police) staff.....
- i. Telephone call from Community Flood Wardens.....

34. What help did the SES provide you with during the November flood?

more than one answer permitted

- a. No help.....
- b. Doorknock (face-to-face advice).....
- c. Providing FloodSmart education information (e.g. brochures, flip charts).....
- d. Community meeting
- e. Flood and storm information line
- f. Community Bulletins at local stores, hotels and service stations
- g. Community distribution system e.g. phone 'trees', flood wardens
- h. Other (please specify).....

35. Do you think the assistance of the SES was better in November flood than the June flood?

- a. Yes
- b. No

Write reasons for answer below.

“to wrap up, some questions about you”.

36. Have you experienced a flood before the June 2007 flood?

- a. Yes
- b. No

If yes where and when?.....

37. Could you please indicate which of the following age groups includes your age?

Read out options below. Tick the option as it is confirmed (only ONE answer)

- a. Teens
- b. Twenties
- c. Thirties
- d. Forties
- e. Fifties
- f. Sixties
- g. Seventy or over

What is your Gender?

- a. MALE
- b. FEMALE

THANK YOU

Appendix C
Agency Staff Interview Questions

***November 2007 Gippsland Flood Review
Interview Questions for Agency Stakeholders***

Organisation.....

Person Interviewed.....

Position.....

Responsibility in Flood.....

Date of Interview

1. Do you think the Tinamba and Newry communities were better prepared for flooding in the November flood than the June flood? YES/NO (probe for reasons)

2. What impact do you think the FloodSmart education program (provide details if required) delivered to the communities between the floods had on the preparedness of the communities for the November flood? (probe for details)

3. Do you think that the flood warning system worked better for these communities in the November flood compared with the June flood? YES/NO (probe for reasons)

4. Do you think that the response by these communities to the warnings was better in the November flood compared with the June flood? YES/NO (probe for reasons)

5. How could the flood warning systems for these communities be improved?

6. What impact do you think the evacuation order issued by the SES on the Sunday at 4PM had on community behaviour?

7. What impact do you think the FloodSmart education program (provide details if required) delivered to the communities immediately prior to and during the November flood had on preparedness and response? (probe for thoughts about the optimum timing of the commencement of community education e.g. after a Flood Watch is issued)

8. How could the FloodSmart education program be improved generally and for during a flood?

9. Did the community education fit well within the AIIMS structure? YES/NO (probe for reasons and how this could be improved)

10. Was the use of the media effective during the flood? YES/NO (probe for how it could be improved)

