

PREPARING EMERGENCY MANAGERS AND THE COMMUNITY FOR FLOODS

Chas Keys
NSW State Emergency Service

INTRODUCTION

It is a fundamental principle of emergency management that communities which understand the hazards they face and know how to prepare for and react to them will have a better chance of mitigating the effects of disaster than those which do not (Emergency Management Australia, 1993, 5-6). Some communities, or parts of them, may develop the appropriate expertise by experience - that is, by learning from their exposure to threats how to develop strategies for coping with them. Farmers, for example, are well used to handling floods. The frequency of inundation of rural land near watercourses, combined with the losses which will ensue if stock and equipment are not moved before flood waters arrive, give farmers an expertise generated by learning from exposure to the flood hazard.

Most groups in Australian society lack this sort of regular and potentially threatening exposure to hazards, however, and are therefore unable to develop experientially-based strategies to ensure that the costs are minimised. These days, nearly all of us are isolated from natural hazards and from many of the threats which originate from human activity as well. One result, all too frequently apparent, is the surprise which is expressed by people when they are hit by disaster - especially if the event is of a type or severity which is outside their recent memory or experience. There is abundant evidence that this is true in the case of the flood hazard.

For people in modern, highly urbanised societies, direct and costly exposure to the consequences of flooding is relatively infrequent - and accordingly so is the opportunity for building awareness of the flood hazard and encouraging the development of threat- mitigating behaviour. Yet the hazard is still very much with us and is capable of causing considerable damage. In New South Wales, the average annual cost of floods has been estimated at \$150,000,000 (Australian Water Resources Council, 1992). This is the state's most serious hazard type in terms of monetary costs incurred. Periodically, the impacts of flooding in particular areas are dramatic, as in the cases of Nyngan and Inverell which were ravaged by floods in 1990 and 1991 respectively and in the rural areas along the Murray-Edward and Barwon-Darling rivers which experienced long-lasting inundation in late 1993 and early 1996.

The threat is real enough. Arguably, though, floods are not perceived in the general community mind as being either sufficiently likely to occur or severe enough in their consequences to be worthy of specific attention or action. Perhaps this is because they cause few deaths and have not built reputations for life-threatening danger to the extent that, say, tornadoes have in the southern and mid-western states of the USA. There, a warning of a coming tornado can be relied upon to see people react immediately by taking cover, dropping everything else to do so (Scanlon, 1990, 236).

In a sense, then, the flood threat is neither frequent enough in its impact nor severe enough in its usual consequences for experience of it to generate deliberate protective behaviour in most people. Accordingly, the prepared community must be purposefully **created** if the effects of exposure to the flood hazard is to be reduced. This means that the credibility of the threat posed by floods must be established so that respect for them can be built. If this can be done, warnings will be more effective

in triggering appropriate responses when a flood event is imminent.

An important subset of the flood liable community which needs to understand the flood threat is the emergency management community. Emergency managers may be paid employees of agencies - police, town fire brigade and council personnel, for example - or they may be volunteer members of community organisations such as the State Emergency Service. These people have the task of co-ordinating flood response activities or of carrying out particular activities - for example, providing information about the nature of a coming flood, assessing its severity, warning people in its path and/or assisting them with property damage mitigation or evacuation. Hardly any of these people have full-time responsibilities in the flood management field, however, and for that reason they cannot practice their roles on a day-to-day basis. Accordingly it is vital that mechanisms are established to train emergency managers in ways that ensure they become expert in the tasks they will have to perform when floods threaten. In NSW, considerable work has been done during the 1990s to develop this training and to ensure that emergency managers achieve higher levels of flood expertise than was the norm in earlier times.

PREPARING THE EMERGENCY MANAGERS

The State Emergency Service, as the legislated 'flood combat agency' in NSW, is responsible for the co-ordination of real-time responses to flooding. The Service accepts the principle that the effective discharging of this responsibility rests upon the existence of a properly prepared community and a thoroughly ready group of emergency managers who understand the flood threat and have come to grips beforehand with what they will need to do to handle it effectively.

To create a prepared emergency management community, three steps have been taken. The first of these, now almost complete, has involved the preparation of flood plans to cover all of the flood prone land in the state. The mechanics of and progress towards the preparation of flood plans has been documented in earlier conferences of the Floodplain Management Authorities of NSW (Haines, 1992, Keys, 1995; see also Keys, 1995/96) and do not need full elaboration here. Suffice it to say that in almost all local government areas with a definable problem of riverine flooding, a flood plan has been prepared by and with the SES Local Controller and usually involving other SES personnel and personnel from other agencies including the police, council, water management authorities and local community organisations. Regional plans have also been prepared to guide SES Division-level flood co-ordination.

This planning process has allowed the development of clearer appreciations of flood problems by the people who will be responsible for managing them, and it has facilitated the devising of particular strategies - for example, strategies relating to warning and evacuation tasks. To some extent the process has simply codified and recorded existing practice, but in addition it has encouraged a critical appraisal of what was done in the past by way of flood management. Importantly it has also encouraged those whose task it will be to manage future flood responses to consider the implications of floods more severe than those they have previously dealt with, including floods which could necessitate large-scale evacuations or involve flooding caused or exacerbated by dam failure. There are in NSW some 28 dams which have been assessed by the Dams Safety Committee as being 'deficient' in the sense that failure could occur and would threaten human life in downstream areas, and the flood plans are recording arrangements to facilitate the particular warning and evacuation requirements which would arise if failure were to become possible. For a discussion of dam surveillance procedures in NSW and planning for areas downstream of deficient dams, see the NSW Dams Safety Committee's most recent annual report (1995, 10-19).

It is one thing to write a flood plan, of course, but quite another to ensure that it is understood and used by the personnel in the agencies with roles defined in it. An important second step in the planning process is, therefore, to ensure that the plan is accepted by the various agencies involved in flood management. In NSW, this acceptance has been sought at the local level by taking a draft flood plan to the Local Emergency Management Committee which is chaired by the relevant council and which contains representatives from each of the emergency management agencies contained therein. Each agency is briefed on the flood plan, provided with a copy and asked to ratify it. As appropriate, suggestions to improve the document can be taken on board by negotiation and revised plans endorsed at succeeding LEMC meetings.

Further briefings can be arranged to remind the various players of the continuing existence of the plan and of modifications which are made to it to incorporate changes to the flood threat or the planners' appreciation of it, or changes to the institutional environment which affect flood management. Each plan is reviewed periodically, after a flood or after a defined period in which no significant flooding has occurred, and any revised version is taken back to the LEMC for endorsement. In this way, a mechanism has been devised to ensure that the emergency management community is constantly reminded of the flood threat and of how it is intended to be managed. This mechanism is vital to ensure that the plan remains alive and that those who will be using it stay aware of its contents. A similar process of ratification and reminder exists for Division-level flood plans which are taken to the appropriate District Emergency Management Committee (DEMC) for endorsement.

Beyond the preparation and ratification of the flood plans the SES has instituted a program of professional development training for its Local and Division Controllers - the key SES volunteers with responsibilities for controlling and co-ordinating flood responses. This training program has now been in existence for four years and has involved training in operational management, the preparation of flood plans, means of keeping the plans alive, the development of high-quality flood warnings, the nexus between floodplain management and emergency management and the special planning considerations that arise when a water storage dam is deemed to be 'deficient' to the point that failure could occur. In addition, workshops have been conducted in which the plans have been 'exercised' by means of group discussions about the control mechanisms they incorporate and the strategies they detail for warning, evacuation, information management and other tasks.

All of this work has taken some years to institute. Doubtless there will be further training initiatives in the future, and it is important to note that the creation of more flood-aware and flood-expert emergency managers is an on-going need. In the past, much of what was done to manage floods was reactive in nature, the managers not having been trained in a widely-encompassing manner or with a preparedness-based focus and relying, often, on no more than their own previous experience in floods. In the modern world, such an approach is not tenable.

PREPARING THE WIDER COMMUNITY

For many years, public awareness strategies have had a low profile in the emergency management field. Their potential as tools for reducing the costs which floods impose has also been little developed, despite the fact that a flood-aware community is recognised in the floodplain management literature as being important in this regard (see NSW Government, 1986). Increasingly, though, the importance of raising the profile of floods in the community mind has come more to the fore and there are commonwealth- and state-based programs being devised with this goal in mind.

Emergency Management Australia, a Commonwealth instrumentality, has long sought to improve community comprehension of natural and other hazards. In this endeavour Emergency

Management Australia is supported by the various state-based emergency service organisations which are responsible for dealing with bush fires, floods, storms, tropical cyclones and other threats. The efforts of these agencies have included the publication or sponsorship of a wide range of pamphlets, booklets and action guides about flood and other hazards and their mitigation and, recently, the promotion of threat-awareness campaigns through the electronic media. Printed awareness material is made available to schools and via the state-based agencies to the wider community. Some initiatives, among them a school resource book on the natural hazards that affect Australia (Dolan, 1995) and the 'Floods aren't Funny' television campaign, have been developed through the efforts of the Australian Co-ordination Committee for the International Decade for Natural Disaster Reduction (IDNDR).

In NSW, the State Emergency Service's flood management responsibilities encompass the specific tasks of establishing flood warning systems, managing flood responses and co-ordinating the evacuation and welfare of communities which are being affected. The public education role with respect to flood awareness is also being discharged. Numerous strategies are being pursued to promote community awareness of flooding and to illustrate how people can protect themselves and their belongings when floods threaten. In some instances these initiatives have been mounted by the SES itself, while in others the Service has sought to form partnerships with media and other organisations to promote community understanding of appropriate means of threat mitigation. The numerous individual strategies are outlined below.

Distribution of Brochures and Action Guides

For many years, the SES has acted as an agent of Emergency Management Australia in disseminating pamphlets, brochures and action guides relating to the flood threat (see Figure 1). Information on warnings and on what to do when a flood strikes is made available at community shows or field days, in SES recruiting drives in shopping centres, and in occasional presentations made by SES personnel to schools, service clubs and other community groups. In some areas, visits are made to locations which are particularly flood liable - riverside caravan parks and low-lying residential streets in known floodplain areas, for example - and flood action cards are presented and explained to those at risk. When time permits these guides (which are magnetised for convenient attachment to refrigerator doors) are also disseminated by doorknocking as floods are rising. They are used, therefore, as part of the warning phase as well as for educative purposes out of flood time.

Figure 1: Flood Action Guide

Information Messages on Radio

Radio and television campaigns are being employed to raise public awareness of flooding. Emergency Management Australia has made use of community service time on the television networks for a campaign on floods (the 'Floods aren't Funny' campaign) which is being launched on a regional basis in NSW in areas about to experience flooding or actually in the grip of a flood. In a parallel approach, the SES has devised a series of four 30-second radio 'infomercials' for radio broadcast - again for when floods are about to strike or are actually occurring. The messages, which were used during the Barwon-Darling flood in early 1996, provide advice on how people can protect themselves and their belongings from flooding and advise that free brochures and emergency assistance are available from the SES. The wording of the actual messages is as follows:

- ◆ While the drought has been devastating, floods do more damage in NSW than other natural hazards. If you live in a low-lying area or near a creek or river, or think your house could be flooded, you need to know how to protect yourself even if there's been no sign of flooding recently. For a free **Flood Action Guide**, call your nearest State Emergency Service Division or Administrative Office, listed under S in the white pages of the telephone directory.
- ◆ Floods do more damage in NSW than other natural hazards, so if you hear a flood warning or are told that flooding may occur in your area, listen to this station for further information. The advice you receive could save your life. For a free **Flood Action Guide** which explains how you can stay safe and protect your property, call your nearest State Emergency Service Division or Administrative Office, listed under S in the white pages of the telephone directory.
- ◆ Here are some handy hints on evacuation. If you decide to evacuate, don't leave it to the last moment, and make sure that you advise the police or the State Emergency Service. If you are advised to evacuate, do so. Before leaving, stack your furniture, gather up valuables, family mementoes and personal medication and turn off the electricity, water and gas. For further information, call your nearest State Emergency Service unit, listed under S in the white pages of the telephone directory.
- ◆ If your home has been flooded, you run the risk of electrocution. Don't turn on any lights or appliances until an electrician has checked your power system. A booklet, called 'What to do before, during and after a flood', provides tips on cleaning up your home. For a free copy, call your nearest State Emergency Service Headquarters, listed under S in the white pages of the telephone directory.

Commemorations of Well-Remembered Events

Reminding communities about past floods constitutes a useful platform for indicating that the flood threat still poses severe risks and that appropriate behaviour can maximise personal and household safety and reduce damage. For some years, the Clarence SES Division Headquarters has provided flood information to the Grafton Examiner which publishes a special insert at the start of the annual North Coast flood season. These inserts provide historical information, details of flood plans, information to allow the community to interpret warnings and tips on how to prepare for flooding.

More elaborate 'reminders' can also be devised. February 1995 was the fortieth anniversary of one of Australia's most disastrous flood events - a flood on the Hunter River which caused 14 deaths and left Maitland and other nearby towns with catastrophic damage from which to recover. To

commemorate this event, a number of educational activities were developed by a coalition of organisations including the SES, the Hunter Catchment Management Trust, the Maitland City Council and NSW Public Works. Two regional newspapers, the Maitland Mercury and the Singleton Argus, were also involved.

The newspapers appealed to people who had been through the 1955 flood, asking them to come forward with stories and photographs, and for three weeks the Mercury and Argus carried the memories of those who had experienced the event. Concurrently, the newspapers published a number of articles provided by the SES and dealing with present-day flood preparedness themes and other flood-related information. These articles were intended to be of educational value and focussed on such things as flood warning systems, flood plans, emergency arrangements for evacuation and the inevitability of future serious flooding. In addition, the local flood plans were put on display in council offices and public libraries.

All this built community awareness of a range of activities which were organised for the last Saturday in February which was the fortieth anniversary of the peak of the flood at Maitland itself. The activities of that day were numerous and included:

- ◆ Street parades in Singleton and Maitland, featuring SES volunteers and members of the several organisations which had been involved in the response in 1955,
- ◆ Displays in the two towns of flood memorabilia (including photographs, old communications equipment and an army DUKW),
- ◆ Guided bus tours, with commentaries, to inspect the Maitland flood mitigation scheme (which comprises levees, spillways and floodgates),
- ◆ Street theatre with a flood theme,
- ◆ Showbags containing flood-related literature (including Flood Action Guides), and
- ◆ The playing of old film footage of the flood itself.

The results were highly gratifying. At Maitland, the Mercury estimated that some 10,000 people - more than a fifth of the city's population - visited the Town Hall to view the display and the film footage, and the newspaper's Friday issue (which included a 24-page feature on the 1955 flood) sold out quickly and had to be reprinted. The eventual sales were two and a half times those of the average Friday, and those of earlier in the week were also up several percentage points on the norm. Very substantial public interest was generated in the commemoration and lively debates ensued in the community on whether such a flood could happen again, how the flood waters would behave given the existence today of a flood mitigation system, and similar topics. Clearly, the commemorative exercise seized the community's consciousness and excited attention. For further information on this event, see Evans (1996).

The Hunter Valley flood commemoration will give rise to others. Currently, planning is under way to mount media-based and other activities to commemorate other flood events - the 1956 flood on the Murray River which, in some locations, was the most severe experienced this century, and the 1986 flood at Bathurst which is reckoned to have been a once-in-80-years flood in that city. In these cases it is not **the most severe** flood ever recorded which is to be commemorated, but rather a very serious one which is within the memory of the present community. The distinction is psychologically significant in the sense that an event which occurred within the last half-century or so

will have a sense of reality that may not attend earlier events even if they were more severe and damaging. Almost certainly, a more effective commemorative exercise can be built around a relatively recent flood than one which struck a century or more ago.

In Maitland, the last week of February each year has been declared by the local council as 'Flood Awareness Week'. This does not mean that a major commemorative event will be mounted each year, but it will provide a platform for obtaining media publicity about flooding and flood plans as well as a base for providing information on flooding to schools and other community organisations and distributing it with rates notices. On significant (round-number) anniversaries, a more substantial effort can be made to re-focus public attention on the flood threat in the Hunter Valley.

Educating the Media About Floods and Storms

As the Hunter Valley exercise indicated, the media constitutes a powerful force for generating interest in floods and for disseminating information about them outside their actual time of occurrence. Media outlets are also vital in the provision of warnings about impending floods and in maintaining a flow of information to the community once an event is under way. Media organisations are not necessarily expert in determining what constitutes useful, community-relevant information, however, and they tend not to have disaster 'roundsmen' who understand floods and who can see in detail how the task of keeping the community safe and well informed can be optimally discharged. Emergency management agencies, however, are well placed to advise on these matters by mounting 'Information Days' for newspaper, radio and television reporters and by providing briefing notes for media personnel once an event is imminent or has begun.

In NSW, the SES has been active in participating in media-organised workshops on floods, helping media people to understand how to obtain information during a flood and promoting the view that the media have a role to play in providing accurate and timely information so that community safety is maximised and people are advised on ways of mitigating the costs of flooding. In addition, briefing notes have been prepared on the nature and impact of flooding on the state's various river systems. These notes are faxed to media organisations when a significant flood appears to be developing and were used in news bulletins during the recent floods on the Barwon-Darling river system. Sensitising media personnel to floods helps to remind them of their role in carrying warnings and of the existence of agencies which they can approach for information once floods strike.

Placing Flood Plans in the Public Domain

In addition to the types of initiatives noted in detail above, the SES seeks to publicise its flood plans and make them widely available within the community. Local flood plans contain a wealth of information which can be used to educate people about an area's flood threat, the roles of the various organisations with roles to play before, during and after a flood, the existence of warning, evacuation and resupply arrangements and many other issues. As the plans are written, they are forwarded to council libraries for public display. Plans also go to council mayors, some of whom use them in radio broadcasts and newspaper interviews, and to local newspapers which are encouraged to produce articles and editorials based on their content.

The local flood plan should prove to be a valuable tool to publicise the existence of flood problems and to debunk well-known myths (such as the notion that very severe floods of the past cannot be equalled in scale in the future and the belief that modern mitigation methods such as levees will render future floods harmless). The plans will also remind people in flood-prone areas that there are things which individuals can do to limit the consequences of their exposure to the flood threat.

SOME CONSIDERATIONS REGARDING THE EFFECTIVENESS OF PUBLIC EDUCATION INITIATIVES

From all these initiatives it is possible to distil some general lessons about the effectiveness of efforts to improve community awareness of the flood threat in NSW. A number of points can be made. Firstly, there is no **single** strategy which can or should be employed over all others. Rather, community education should be sought by pursuing a **range** of devices of different sorts which can be layered upon one other. The strategies need to be several and of wide compass if they are to achieve broad market penetration: this will give the benefit of repetition of messages as well as reaching out to different parts of the market which receive information from different sources. A case in point is the wide-ranging flood awareness campaign which was carried out in the Hawkesbury-Nepean river valley, on Sydney's western and north-western edges, in 1994. This campaign utilised letterbox drops of flood information, media briefings, public meetings and a telephone 'hot line' to promote public awareness and understanding of the flood threat.

Secondly, community education about floods needs to take account of the fact that communicating with the public on these matters must be planned for strategic **times**. Flood seasonality in NSW is not precise, but it is clear enough to indicate that campaigns in the northern part of the state should be mounted in summer and autumn while those in the south would be best conducted in winter and spring. Beyond that, it is likely that there is little point in mounting flood campaigns in areas which are gripped by drought since the community is unlikely to be receptive - unless, of course, an opportunity arises whereby the community's attention can be obtained despite the drought. The Hunter Valley commemorative exercise suggests that it is possible to gain public attention at an otherwise unfavourable moment provided that it is possible to obtain media co-operation. In the Hawkesbury-Nepean valley the fact that flooding has for some time been on the local political agenda has also been of value in creating a community which is 'ripe' for messages about the threat which floods impose.

In short, those responsible for public education campaigns about floods need to recognise that there are 'teachable moments' (Filderman, 1990, 223) during which the community's awareness of flooding is or can be heightened. Outside these times, which in some areas may amount to only a few weeks or months in a period of several years, it may be very difficult to impart the appropriate information. It behoves the planners of educational campaigns to recognise that both success and cost-effectiveness are likely to be maximised only at those times when message receptiveness is high. It is for this reason that the SES is not conducting a single state-wide campaign on flood awareness, but is launching campaigns at different times in different regions to take account of variations in the timing of the release from drought conditions. It is not the convenience of **agencies** with responsibilities for educating the community but the **receptiveness of the community** which must dictate how and when the educational task is undertaken.

Thirdly, the effectiveness of community awareness initiatives can often be enhanced by creating **partnerships** of organisations with interests in heightening the community's understanding of hazards. In NSW, the SES as an agency concerned with flood management has found a useful ally in the Bureau of Meteorology (the nation's official flood forecaster) in the task of approaching media organisations to discuss flood warnings and flood awareness campaigns. The planned Murray River valley flood awareness exercise, which is intended to be mounted in the spring of this year, is likely to involve a wide range of agencies including the SES, several local councils, the Murray Darling Basin Commission, the Murray Darling Association and the Department of Land and Water Conservation. Various Victorian organisations will also participate.

Media involvement is critical in these exercises. In the flood commemoration initiative in the Hunter Valley it is difficult to see how strong public interest could have been achieved without the enthusiastic participation of the local press: the help of the Maitland Mercury and Singleton Argus in tapping the community memory of flooding created an excellent basis from which the existence of flooding as a continuing problem could be highlighted. Future commemorations will also need to recognise the importance of memorabilia in engaging the community and stimulating interest.

To date, the SES has not sought to measure scientifically the effectiveness of those public awareness campaigns in which it has been involved. In due course, however, it will be necessary to determine the relative levels of cost-effectiveness of different approaches to the task in order to ensure that the expenditure of public moneys is soundly based. For the moment, expertise in these matters is still being developed but before long it is likely that research will be commissioned to determine the impact of, for example, radio 'infomercials' as means of educating people about preparedness for flooding.

There are, of course, other relevant initiatives besides those which are noted here but which are beyond the scope of this paper. These include programs of hazard education in primary and secondary school curricula, the establishment of permanent markers indicating the levels which were reached in previous floods, and the dispatching of flood-related information with rates notices. The second and third of these initiatives, of course, are within the capacity of local governments to implement.

SUMMARY

Hazard awareness campaigns are not new in Australia. However, it is fair to say that such campaigns are presently being transformed from being limited in extent and largely based on simple, unsophisticated strategies (such as the dissemination of brochures in shopping centres and the provision of stimulus material to schools) towards the mounting of multi-dimensional initiatives which pay more attention to the principles of communicating with the public. We may expect, too, that greater resources will be committed to the public education task in the future than has hitherto been the case.

In all of this, the importance of a flood-ready emergency management community must also be recognised. Recent efforts have sought to increase the level of flood and flood management expertise at the local level in organisations such as the SES, and to ensure that the personnel of other agencies with roles to play understand, through the processes of negotiation and education, their own roles and how they will need to be played out. Flood education must be pursued at a range of levels and be carried out over the long term if it is to maximise community preparedness for flooding.

REFERENCES

Australian Water Resources Council, 1992. **Floodplain Management in Australia**, Water Management Series No 2, Department of Primary Industries and Energy.

Dolan, C., 1995. **Hazard-Wise: Classroom Resources for Teachers on Natural Hazards and Disasters**, Emergency Management Australia, Canberra.

Emergency Management Australia, 1993. **Commonwealth Counter Disaster Concepts and Principles**, Australian Counter Disaster Handbook, Volume 1, 2nd edition, Canberra.

Evans, G., 1996. Flood '55: the 40th Anniversary of the Great Hunter Valley Flood, paper presented to the 36th Annual Floodplain Management Conference, Grafton.

Filderman, L., 1990. Designing Public Education Programs: a Current Perspective, in Handmer, J. and Penning-Rowell, E. (eds), **Hazards and the Communication of Risk**, Gower, Aldershot, 219-31.

Haines, R., 1992. Planning for Flood Response Operations: a Progress Report, paper presented to the 32nd Annual Flood Mitigation Conference, Bankstown.

Keys, C., 1995. You Can't Move the Town ... So You Must Make it Safe, paper presented to the 35th Annual Flood Mitigation Conference, Wellington.

Keys, C., 1995/96. Planning for Floods in New South Wales, **The Australian Journal of Emergency Management**, 10, 4, 27-32.

NSW Dams Safety Committee, 1995. **Annual Report 1994/95**.

NSW Government, 1986. **Floodplain Development Manual**.

Scanlon, J., 1990. People and Warnings: so Hard to Convince, in Handmer, J. and Penning-Rowell, E. (eds), **Hazards and the Communication of Risk**, Gower, Aldershot, 233-45.

Presented at the 36th Annual Conference of the Floodplain Management Authorities of NSW, Grafton, 1996.