

Dismantling Human Barriers to Flood Warning

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Abstract

Over time our ability to forecast flood levels and the consequences of flooding have improved but have we made sufficient advances in communicating flood risks? Are we getting better human responses to flood threats?

This paper looks at some of the human barriers to flood warning messages being acted upon, and how communication theory helps us understand how to dismantle those barriers.

The Three Phases of Flood Warning

There have been significant advances over recent decades in the technologies and their application for modeling floods, forecasting rain and disseminating warning messages. Have the ways in which people behave in floods made similar advances and if not why not?

Jim Bodycott suggested at a recent flood warning workshop at Mt Macedon (Bodycott, 2002 unpublished), that there are three phases of flood warning:

- Forecasting;
- Planning; and
- Communicating

I want to focus on the final one.

Many of the people working in the flood management industry are either engineers or scientists who are good at the mechanical, numerical and technological investigations necessary for accurate and timely forecasting.

The State Emergency Service (SES) has traditionally been a response agency but is now leading the way in terms of good planning. The work done by Steve Opper, Peter Cinque and others has been ground breaking in understanding the logistics of mobilizing emergency services and disseminating timely warnings.

But where are those who understand the communication issues because we can't address the other two areas without adequately addressing the third. Good forecasting and planning will be no use in saving lives and property if those in the path of the floods do not respond appropriately to flood warning messages.

Communicating effectively requires people with different skills sets.

Poles, Pamphlets, Press, Parades and Properties

The concept of putting markers on power poles probably started in Maitland in 1955 and was perhaps motivated as a reminder to the community of a shared experience rather than a warning to future generations. Nevertheless, it has been held up many times as an example of how a community can be constantly reminded of the magnitude of potential floods.

In the last ten years numerous communities have installed variations on that theme with totems and other markers showing historical and/or potential flood levels.

Of course even engineers have recognised that sticking lines on poles is not a sufficient means of communicating flood risk by itself.

So we have produced pamphlets which explain, often in great detail, the risk that floods present. What chance the flood has of occurring, what levels it will reach and what area will be inundated.

Progressive thinkers enlist the press in getting people prepared for flooding. They will organise colour supplements in the local paper telling in great detail what happened in some historic flood which the local community experienced.

Others have tapped into community events or even created events around a flood theme to educate the community about their flood risks.

Of course there has also been significant resistance to such activities from residents directly, or more often than not, through their elected local representatives. The concern which is always raised is the one of property values. Yet there is little, if any, actual data to suggest that publicized flood risks reduce property values. Anecdotally I also get the impression that it is investment property owners rather than home owners who are more concerned about a property's flood risk being publicized.

The enlightened citizenry of Kempsey were not so daunted. In 1999 the SES and Kempsey Shire embarked on an awareness campaign involving production of a video and newspaper supplement, public meetings, displays of photographs and memorabilia, distribution of flood safety brochures and other events (Dutton, 2000).

A flood icon was erected in Clyde Street Mall to allow a physical representation of the peak flood levels and some ongoing reminder of the 50th anniversary of the 1949 flood. The icon is a carved timber pole marked with coloured rings at the various historic and predicted flood levels and includes an explanatory plaque. The top of the pole (6m above the pavement) shows the Probable Maximum Flood (PMF) at Kempsey (Dutton, 2000).

Post event surveys suggested that the awareness week had increased awareness in a community which had little flood awareness beforehand (McKay, 2002).

Then in 2001 their flood awareness strategy got put to the test. There are others who can speak more authoritatively than I as to what happened in that event. However, it is reported that a post flood survey found that about 84% of people took action to minimise flood damages incurred at their property. Actions included raising or moving building contents, stock, personal belongings or moving motor vehicles to higher ground (Gissing, 2002).

Nevertheless there was not an overwhelming response to the flood warnings and particularly to the call to evacuate. Reasons given for poor response to warnings included confusion about warnings, inadequate warning time and little flood experience or preparedness. Businesses expressed unhappiness about the warnings with 85% indicating dissatisfaction. Many were dissatisfied about not personally receiving warnings from emergency services. Confusion occurred as the result of conflicting and inconsistent reports often through informal channels and being unable to relate gauge heights to their particular business (Gissing, 2002).

But why did this happen when so much effort was put in to getting them prepared for the possibility only a couple of years previously?

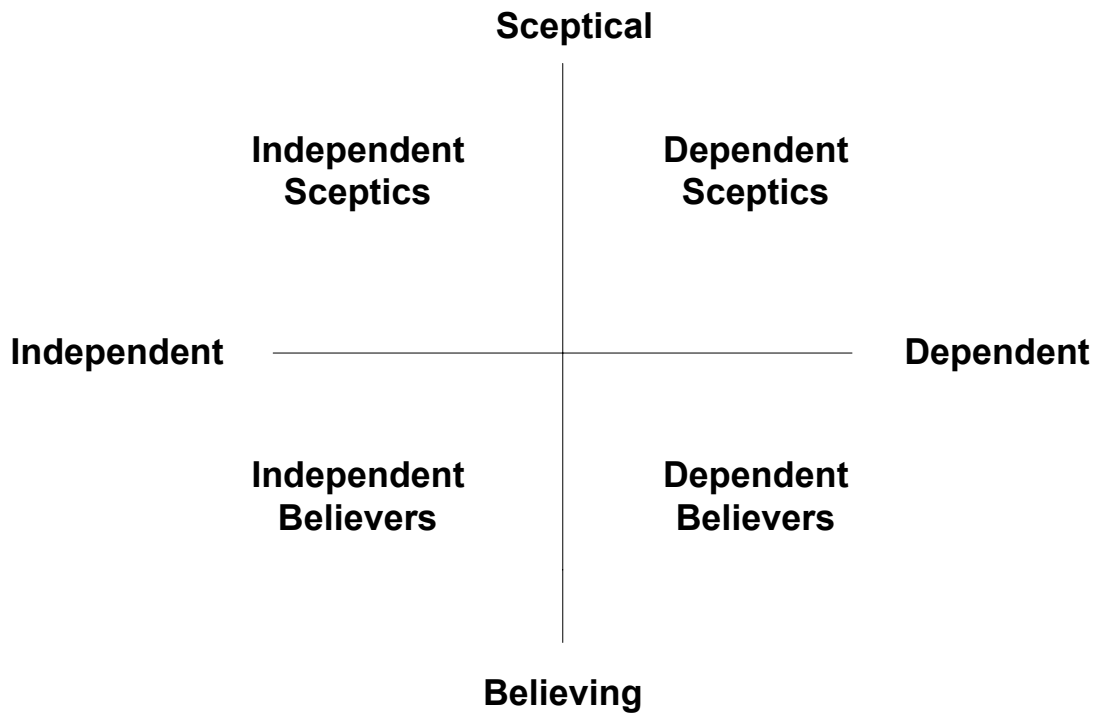
A Predisposition

Perhaps a good way to start answering that question is to strip back flood warning and response to a few fundamentals. Ultimately the objective of any flood awareness and preparedness work is to get people to respond appropriately to a flood warning message when it is issued.

The action people take however will be greatly influenced by their attitudes. Not only their attitude to flooding and the information being delivered but also their attitude to those who deliver the message and their attitude to themselves.

The following diagram suggests that all people in a floodplain fall into one of four categories:

Independent Sceptics – these are the people who don't believe the flood warning message and think that they know better than those issuing the warning. They probably question the flood awareness and warning information, think they have better ideas on how to respond in a flood, are unlikely to look for help during the event and after the event are likely to tell the community where the experts went wrong.



Dependent Sceptics – these people also don't take the flood warning messages seriously but rather than thinking they know better than the experts they simply expect that all aspects of flooding from mitigation through to response is someone else's responsibility. After the event they are the complainers and blamers looking for someone to take responsibility for their losses.

Dependent Believers – these people believe the flood warning message but don't believe in their own ability to respond. They want and expect help every step of the way. They demand significant resources during and after a flood.

Independent Believers – these people not only believe flood warning messages but take emergency service response advice to heart and act appropriately without the need for much external assistance.

I accept that the above is something of a simplification and there are probably shades of grey between some of the categories. The category that people fit into may also change from flood to flood. For example people are more likely to be believers if the flood is similar to one they have already experienced but their very experience of a flood may make them unbelievers if the next flood behaves differently to their expectations.

However, it is helpful to use such a diagram as a tool to understand how to get better flood warning responses.

Flood warning messages are by and large aimed at the believing independents. This is appropriate because there is insufficient time and resources to convince sceptics during a flood.

If people are dependent then they will require a lot of help. If too many are dependent then there won't be enough resources to help them all.

The desired goal is to have as many people as possible being independent believers because these people will make the most appropriate flood response drawing on the least amount of external resources.

The key is to do that before the flood arrives.

It must be recognised that even after an effective preparedness strategy the physical and/or mental limitations of some will mean that they can never be shifted into the independent believers category or the cost of trying to shift them is too great. Therefore there must also be messages and resources for the other categories during a flood but the effort must be put in beforehand to reduce those numbers.

The question then is how do you make sceptics become believers and dependents become independent? Ultimately it may only be visual queues for some on the day which stop some people being sceptical. But if they have been equipped to respond then this is not necessarily an impediment to appropriate flood response.

Importantly people must be enticed to change camps not brow beaten in to it. This is where understanding communication theory is important.

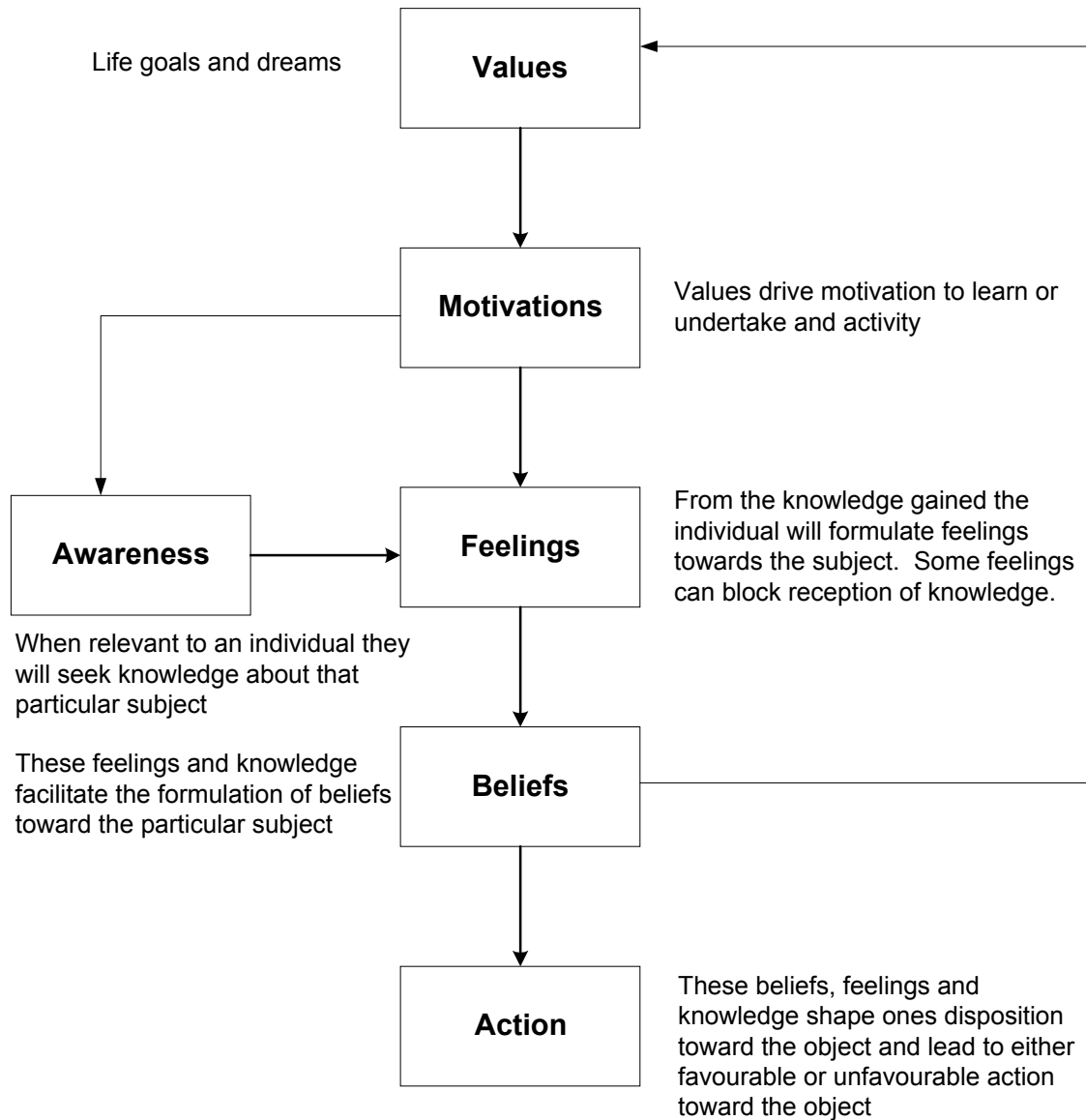
Attitudes and Actions

The following diagram shows how people's actions arise from their beliefs. These are driven by their feelings which in turn are influence by both their awareness and their motivation. Motivation is based on values which in turn are reinforced by beliefs.

This diagram illustrates a number of things. Firstly we cannot change peoples actions by simply providing them with information. We first need to change their beliefs. While providing them with the appropriate information is key to doing this it cannot be done without understanding their values and motivations and it must be done in a way which is sensitive to their feelings. Otherwise the information will be rejected.

Secondly, it is a self sustaining model and will only change if there is a new awareness introduced. As new information is introduced sensitively it will incrementally change beliefs which will change values which will in turn make people more receptive to the information which will change beliefs further. This all takes time.

It is therefore not only what is communicated about flooding before, during and after an event but it is how that is communicated which makes people receptive to the message. Some key ideas in using this theory in making a flood preparedness strategy more effective follow.



Affirm Values

Many people choose to live near a river because it is a lifestyle choice. This is strongly influenced by the values those people hold. Blunt statements of flood risks can often be interpreted as a criticism of those values and choices.

If people think you are telling them they have made a bad choice by locating in a floodplain they may become defensive. They will try and justify themselves and either consciously or subconsciously deny or question your information. Worst still they can try and seek affirmation of their own values by influencing the beliefs of their neighbours.

Try to affirm their values and be positive about the choices they have made. List the positives about living near a river but then point out the downsides and how there is a plan to help them minimize those risks.

Be a Motivator

Tap into people's values to give them the motivation to listen to your message. If they are family oriented then talk about what they can do to ensure the safety of their children. If they have flood affected businesses tell them how a small investment of their time can potentially save their business thousands.

Be Sensitive to Feelings

This flows from how you account for people's values in your message. Offending someone, frightening them or making them feel powerless will all work against people believing your message.

Challenge Beliefs

Ultimately if people are to move from being sceptics to believers, or dependent to independent their existing beliefs must be challenged. Either their belief in what can happen or their belief in what they can do.

It is important to know what they believe and why before you can challenge those beliefs. This requires some form of research before a communication strategy is devised.

Recognise that flood awareness information comes from other sources than the official communication strategy. These other sources can undermine the preparedness message particularly if they have stronger links to people's values or feelings than the official messages. The experience of a flood itself is often the most powerful communicator. This is not always helpful.

If people hold particular beliefs about how floods will behave because of their previous experience then all warning messages will need to include words to the effect “this is not like any flood you’ve seen before” if that is the case.

If people believe that they will need substantial help then messages need to include phrases such as “things that almost anyone can do”

Assume Nothing

The more you become familiar with a subject the more likely you are to assume that the people with whom you are communicating will have some level of understanding of the matter. This is dangerous. Always start at the most basic level with the information you are disseminating.

Tell them what they need to know

Ultimately people need to take action in response to their flood risk. The basic information they need to know is how a flood is going to affect them and what they need to do about it.

Don’t clutter the message with technical information which simply confuses them. I recommend not discussing flood probabilities.

Be personal and specific. Give people information on how exactly the flood will affect them and what exactly they are expected to do. Try and avoid giving information in a way which is open for them to interpret. There are a lot of people in experienced flood communities with their own flawed flood models in their heads. Don’t give them inputs for their models give them outputs from yours.

Recognise that the information needs of rural, business and residential communities differ.

Be Persistent

The incremental shifting of values and beliefs also means that information needs to be given repetitively for a wholesale shift in beliefs to occur.

Because individuals experience floods infrequently it is important that they are reminded of what floods can do and what people need to do. Simply giving the message once or reminding them of it occasionally will not be sufficient for the information to be available when it is needed in a flood. Messages need to be repeated and reinforced through a variety of media with a great deal of regularity.

Consideration should be given to communicating to one flood prone community the details about another community’s experience when it is affected by flooding. This way

the lessons of what to do and what not to do are reinforced by details of real people in real events. Such an approach would benefit from a statewide or even nationwide communications strategy.

References

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Steven Molino is a Principal of Molino Stewart who has considerable experience in a wide range of water cycle projects and has spent a substantial part of the last decade investigating flood damages, mitigation and flood preparedness. He was the project manager for the Warragamba Flood Mitigation Dam EIS and the Warragamba Auxiliary Spillway EIS and has advised the Hawkesbury-Nepean Inter Departmental Committee and the Hawkesbury Nepean Flood Management Advisory Committee. He recently prepared a flood preparedness strategy for the Woronora River in southern Sydney which is now being implemented.

He is currently providing an independent review of flooding and evacuation issues associated with the proposed 5,000 dwelling Penrith Lakes Development in Western Sydney and is advising State Water on the upgrade of Keepit Dam

He has also project managed the design and implementation of numerous community education projects drawing together his own technical expertise and the communications and education expertise of his staff.