

Human aspects of the Katherine-Daly flood disaster

Many important lessons can be learned from those who experienced the devastating rainfall inundation and flooding in the Katherine and Daly River Regions in the wake of severe tropical 'Cyclone Les' early in 1998 (Munday, 1998). Capturing manifest human emotions and perceptions as soon as possible after the disaster is valuable in an attempt to ensure the best possible well being for those exposed to similar situations in the future. This article complements one recently published (Skertchly and Skertchly, 1999) which focussed primarily on the material and technical aspects of the 1998 Katherine flood. Here we provide an overview of some key human aspects and findings derived from consideration of the 1998 Katherine and Daly Rivers Region Flood.

The paper draws principally upon the work completed for the Emergency Management Australia commissioned Katherine District Flood Disaster Study (Skertchly and Skertchly, 1998) and subsequently published reports, particularly the 1999 Katherine Region of Writers' book *The Katherine's Comin Down* which documents personal Katherine flood experiences. Media sources were also utilised. The article captures important disaster-coping capabilities sketching key characteristics of disaster-robust people. We note some psychological issues and problems that merit further investigation.

Unexpected traumatic transitions

Katherine and Daly Rivers of the Northern Territory of Australia, are major tropical rain-fed watercourses upon whose banks, and in the surrounding regions, the flood-devastated settlements were located. The Katherine Gorge catchment and Douglas-Daly Region are well known to experience adverse impacts of tropical rains and raging floodwaters in the severe tropical cyclone-prone "Wet" season. Those who choose (or are compelled, by circumstance) to live close to a natural hazard, such as a major watercourse, do, of course, take risks associated with possible floods.

Katherine and Daly River towns and surrounding communities generally enjoyed normal contemporary Australian small self-centred town and bush lives and

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living just before the 1998 flood. Then, rather suddenly, many inhabitants and visitors had to cope with life-threatening dangers as the torrential rains associated with ex-tropical Cyclone Les wrought havoc. People were catapulted rapidly from the certainties and routines of every-day life to experience the discontinuities, disruptions and discomforts of an unanticipated natural flood trauma.

Within a relatively short period of time a 'State of Disaster' was declared in the Katherine-Daly Region and major emergency counter-disaster management took

'You walk into
someone's home and
see their life there all
over the floor.'

– Northern Territory
Emergency Service
worker, Katherine 1998

over. The immediate task was to save lives, prevent serious injuries and safeguard property. Thousands of people were evacuated to safety and provisioned with the aid of 4000 flights. With the floods receding, the next thing to think about was reconstruction—getting the people home and communities back to normal. Thus, two complex transitions occurred. This paper highlights personal attributes, which facilitate robust personal coping behaviours in such dangerous disaster situations.

Most mainstream Australian settlements at least embrace arrangements and resources, which enable the following:

- avoidance of serious harm

- provision of harm-free shelters
- maintenance of secure, non-hazardous environments
- maintenance of individual and social behaviours acceptable to all
- maintenance of immediate physical health
- maintenance of immediate mental health
- adequate unpolluted water
- adequate nutritional food
- availability of some recreational diversions
- sufficient cash flow of negotiable currency

The survival and safety of individuals and communities traumatised by the extreme forces of nature cannot ever be absolutely guaranteed. But to the extent that sound forecasts can be made; plans formulated and resources and capable emergency managers provided, and impacted individuals respond effectively to well-informed directives and requests, the capacity to cope and survive in the immediate disaster aftermath will be much enhanced, with the basics of life, such as those noted above, being maintained.

Table 1, Emergency and Disastrous Events—Main Strain Characteristics, summarises key concerns which many people perceive they may need to contend with in extreme unexpected situations (Paton and Long 1996).

Emergency management critical services and utilities available to Katherine

The on-going sufficient provision of critical life-supporting services and utilities is at the heart of successfully coping with extreme hazards, such as the 1998 Katherine Flood. These derive predominantly from normal resources put to emergency use. The aim of emergency interventions is to facilitate maintenance of living essentials. Without timely well-managed interventions utilising available resources, there would certainly have been further considerable loss of life and extreme deprivation for the Katherine and Daly regions residents and properties.

Generally, the Katherine-Daly communities already had in place an array

Emergency and Disastrous Events— Main Strain Characteristics

1. Lack of warning
2. Abrupt contrast of scene
3. Type of event
4. Nature of destructive agent
5. Degree of uncertainty
6. Time of occurrence
7. Presence of traumatic stimuli
8. Lack of opportunity for effective action
9. Knowing the victims or their families
10. Intense media interest or public scrutiny
11. Physical or time pressures
12. Increased or unexpected responsibility
13. Greater than usual, physical, mental and emotional demands
14. Contact with victims
15. Resource availability and adequacy
16. Co-ordination problems
17. Inappropriate leadership practices
18. Inadequate and changing role definition
19. Conflict between agencies
20. Single versus multiple threats
21. High work loads

Table 1: Emergency and disastrous events—
main strain characteristics

of official arrangements and resources with which to cope with emergencies, including floods. What was underestimated by authorities and most people was the early advent of a flood as severe as that, which occurred in 1998. A recent estimate (Skertchly, 1999) is **that a flood of similar magnitude, or greater, than the 1998 Katherine flood has a 1 in 77 year probability.** This contrasts markedly with the then, pre-1998, flood prevailing notion that such a flood would have but a 1 in 200-500 chance of occurrence.

Emergency management interventions available to Katherine may be considered under various categories. They derive from normal capabilities in such key domains as:

Protection and Security: Military Capabilities. Roles and work of the Northern Territory Police, Fire and Emergency Services; Prison Services etc. State of Disaster Directives/authority/sanctions. Fraud, pilfering & crime prevention.

Biophysical and Psychosocial: Air, water, sewerage and sanitary; Energy and Power; Medical, safety, nursing, immunisation; psychological, welfare and churches. Babies, sick, frail, aged, mentally

disabled etc. Animals and veterinarians. Natural hazards awareness.

Shelter and Technological Resources: Emergency Command Modules; Accommodation; Emergency accommodation-individuals, families, communities; victualling, grog and supplies; discipline, negotiable instruments, funds/cheques.

Transportation: Aircraft-fixed wing and helicopters, airstrips and landing areas; power boats and kayaks; vehicles-official, private cars and trucks, etc; highways and other main roads repair; minor roads re-opening.

Communications: Meteorological forecasts-accuracy, timeliness, responses; Emergency/Disaster Plans; Radio/television-forecasts and reporting. Optical cable and satellite reliability; emergency police and defence nets; pigeons.

Political and bureaucratic: Emergency and disaster response capabilities and competence of public bodies other than dedicated emergency bodies. Political leadership at local, Territory and federal levels. Visitations, promises, exploitations.

Individual and Community: Service clubs, agencies churches, welfare agencies, private providers; appeals in cash and kind.

Risk Insurance and Reconstruction Support: Building locations, insuring risks, reconstruction funds. The tyranny of 'status quo' restoration. Ensuring better protection in the future?

Fostering a hazard mitigation culture: Replacing the traditional Australian 'she'll be right culture' with one of responsible natural and technological hazard mitigation and human settlement sustainability.

In essence, Katherine already possessed a sophisticated potential for effective counter flood disaster measures.

The characteristics and dimensions of the disaster itself; the characteristics of the people; and the activities undertaken by many people working in the above categories, and the people themselves, determine the perceptions and coping behaviours of the disaster-affected community at large. These characteristics and dimensions are highlighted in the next section.

Knowledge of Katherine's flood-prone characteristics

The general population was largely unaware of the extent to which their settlement was disastrously flood-prone. This was the case for 'the man in the street and on the land' as well as almost all

inhabitants. However, Aboriginal Australians have lived and coped successfully with floods for tens of thousands of years, including those in the Katherine Region. Palaeobiological and other evidence from Katherine Gorge confirms very high level floods in the past (Knott 1998). Living Aboriginals (Harney 1999), recall tales of past extreme floods.

A handful of people were well aware of real flood risks in the region. However, only a few members of the contemporary Katherine community had an inkling of the prospect of a flood of 1998 magnitude. Even those who had a professional interest in such matters were lulled into a false appreciation of the potential levels of flood-proneness through such documents as the 1 in 100 Year Flood Map (Department of Lands, Planning and the Environment) and the Katherine Counter Disaster Plan (NTES 1996).

The official Counter Disaster Plan for Katherine included a flood-coping plan embodying inputs from a number of relevant Departments. This Plan purported to give indicators of severe flooding to the 1 in 100 level. The flood forecasting system accommodated the notional 1 in 100 flood levels. Key people were flood-response aware and able, within the official counter-disaster framework. But the flawed 1 in 100 official flood benchmarking induced a wholly false sense of security.

To an overwhelming extent, Katherine Region residents were completely caught by surprise and expressed incredulity, as they witnessed at first hand, the severity of the 1998 flood hazard event.

It is self-evident that when there is little or no personal awareness of the scale, timing and other characteristics of a pending high impact emergency event, then little or nothing will be done to prepare for it. The whole of Australia was looking forward to a holiday weekend and Katherine was no exception. As the Australian-South African cricket match proceeded and preoccupied residents, the complex, rapidly engulfing, rising and expanding flood, progressed quickly into an emergency disaster of unprecedented proportions. Many rivers and tributaries broke their banks inundating 1,000 square kilometres, causing the evacuation of 5,000 residents and the catastrophic flooding of 1700 residences and 500 businesses. An unforeseen and frightening disaster had unfolded.

Emergency response operational leadership

The overall success of the Katherine

District Flood Emergency Management operations rested upon the shoulders of a small group of top general contingency managers—Police, RAAF and a bureaucrat, the core—coordinating the responses of capable technocrats and their willing colleagues. Able, adaptable, effective, transformational human leadership to respond soundly, to this comprehensive flood inundation, was clearly evident. The fact that the people in such an extremely demanding situation handled it so well was a tribute too to those who had earlier selected and trained them.

As the emergency evolved rapidly into a 'state of disaster' the operations centres at Katherine and Berrimah Police Head Quarters came to life and the Northern Territory Counter Disaster Council met to monitor events. The decision-making and directing of the official bureaucracy and government quickened. Authoritative decisions and actions needed to be made fast by empowered leaders. Through largely face-to-face communications and collaborative commitment, the activities necessary to cope with this extreme crisis were successfully targeted and expedited. All key and necessary people participated. Katherine Regional Police Head Quarters became a multi-modal 'Beehive'.

The essence of operational success lay in the mental robustness, extensive know-how, conscientiousness, dedication and adaptability to rapidly changing complex circumstances that confronted the top, coping, leaders and their able experts. Conditions at operational centres were often frenzy, but a highly productive frenzy.

The question of how to quicken the response of people generally (followship) to potentially serious and life-threatening emergencies is important. On a number of tense occasions at the evacuation centres the Mayor of Katherine spoke directly to the people reassuring them as to the necessity for strangers to enter their homes and remove, on public health grounds, decaying materials. He also instigated brief return visits by evacuees to their flood ravaged homes. The Mayor, as chief citizen played a key role in reducing tension and assisting in maintaining civil order and social controls (Little 1999).

Great variability exists in Aboriginal communities as to effective day-to-day administration. When a community lacks cohesion, or ignores the advice of expert others, this seriously and adversely affects its capacity to respond and cope efficiently when exposed to potentially damaging natural hazard risks. In the case of the flooding of Beswick community,

the total responsibility for safeguarding and evacuating the community rested on the shoulders of the Officer in Charge, Maranboy who coped with all the many demands placed upon him in an outstanding manner. At the time of the flood, the Beswick community on its own could not have coped to secure the safety of all residents.

Waipiri people reacted at a late stage and they had to walk out of the community in waist-deep rising waters.

At least one community, Ngkurra (Roper River), anticipated and coped with the worst of the floods on their own. This community, under the highly commendable leadership of their local Officer in Charge, brought in extra supplies at an early stage and were therefore relatively self-sufficient. Other communities, such as Daly River, which are well administered too, were simply overwhelmed by the magnitude of the flood and had to be totally evacuated (to Batchelor) with the aid of official external emergency resources. The Daly River community were dislocated for one month before they could return.

Any sound approach to emergency preparedness and response must face the reality of widely contrasting cultural and awareness differences. Leaders must ensure that emergency communications are effective for all kinds of people. In the case of the Katherine flood, widely differing social control mechanisms existed.

Throughout the immediate emergency responses and well into the recovery stage, those concerned with managing and reconstructing the physical fabric and vital systems of the towns and settlements did an outstanding job. All essential services and utilities were kept operating to the maximum capabilities available. Much of the credit for this lies in the high quality of the multi-faceted, multi-skilled and highly experienced, human-power available *in situ* and the resources that they could access or utilise, or acquire. Many people released and exploited dormant talents.

Irresponsible behaviour

There was evidence of some social issues that militated against the harmony and well-being of quite a number of people. Indeed, a number of persons commented that the problems caused by the emergency relief and recovery measures were more difficult to handle than those of the flood itself. Here, the most important of these are noted. (See Table 4 for further details.)

At normal times the problems of drugs, petrol and alcohol dependencies in many Northern Territory communities are serious and well known. In the circumstances of supply deprivation of the post-evacuation stage, and with even fewer commitments than usual, the scene was ripe for dangerous rising social tensions. In some evacuation centres there were initially a number of nasty anti-social events. Such events were close to inconsequential compared to the excessive drinking and gambling problems that arose in some groups during the later stages of flood recovery.

These problems, in large part, arose from open-ended money distribution and cheque releases that were made to flood victims by a number of government bodies.

Much of the money distributed was spent on alcohol and gambling with ensuing binges. In many cases, as reported at Katherine, Batchelor and Beswick, the control of numbers of highly inebriated people was difficult. Such circumstances caused many potential risks and dangers to others. Beswick women and children fled out of the community, many to Darwin. This added an unwanted further extreme concern to the heavily taxed Maranboy police force.

The possibility of locally available 'sworn' police aides for commissioning in times of emergencies should be considered. At Daly River on the other hand, after experiencing unacceptable behaviour at Batchelor, further cash grants were directly converted to necessary household goods to replace those lost. Widespread, discretionary cash should not be available, as this form of relief aid can lead to damaging anti-social behaviours. The form and distribution of relief funding and resources needs addressing in detail.

A small percentage of any contemporary population will always seek to gain advantages from confused abnormal situations. To the extent that other priorities in extreme emergency situations makes possible, the whole community, and especially its key people should be alert to this possibility. There were confirmed cases of looting from local businesses, schools and residences in Katherine Township.

Coping behaviours—majority

People living in isolated/remote settlements generally display high levels of self-reliance. The Katherine District is a good case in point. Although very largely reliant upon government utilities and resources

for ultimate survival, often the directives from authority figures as to actions to be taken are not taken kindly by local inhabitants.

Until the water was seen to be visibly rising into houses and the direct evidence of eyes and senses conveyed the actual seriousness of the situation, many people did not take the evacuation advice seriously. The ultimate need, in the face of clear danger, to secure their own safety and survival provided the motivation for most, (with the exception of two people), to, ultimately, respond positively to directives and at least save lives.

As the floods adverse impacts increased rapidly, affected persons responded and acted accordingly. Key people endeavoured to maintain vital services and utilities; many individuals selflessly cared for and helped save property for others. Virtually every person made positive contributions to community well-being once the enormity of the flood disaster was apparent. Many individual life-guarding and humanitarian initiatives were undertaken as responsible people did all that they could do to save, protect and maintain the functionality of their domains. Where it was not possible any longer to do so, many people from all backgrounds in the flood zones contributed substantially and vitally to affecting rescues and evacuations. As thousands of people had to relocate; critical services were kept working due to the relentless work of their people; large numbers of people contributed in ways they would never have thought possible

The overall evidence gained from this study confirms that those who are best able to cope with life and its many changing circumstances and uncertainties, such as the Katherine-Daly flood, possess, *inter alia*, personalities embracing the attributes of 'mental stability', 'conscientiousness' and 'openness to new experiences'; (Clausen 1992, Costa and McCrae 1992), 'naturalistic intelligence' (Gardner 1997) and a positive 'optimistic outlook' (Seligman 1992). As is amply testified in the personal case studies of the Katherine flood, high-level personal coping qualities were in abundant evidence in leaders and managers and most (c. 80+%) of the people.

As well, 'emotional robustness and intelligence', the mature understanding and management of human emotions, are now also seen to play a vital part in adaptable self-management and living comfortably and adapting more readily to precipitate change (Goleman 1994, 1998; Weisinger 1998). The principal

Personal Emotional Responses in the 1998 Katherine-Daly Flood (The Katherine's Comin' Down, 1999)	
Anger:	The reality began to sink in. Most had lost everything. Homes, cars, business, possessions and personal items. This was their moment of truth. (88)
Calm:	I got to the police station and what a hive of activity it was. The calmness of the people was a credit to them. (17)
Concern:	Some of them didn't know if their families were alive or dead, but they kept on working, they just rose above their personal disasters. (15)
Disgust:	Another thing that shook us up a bit was when Macca and I had to do a floater-a dead body. It had been out there three days and it stank. I've dealt with dead bodies before but the smell was the thing that got me. (23)
Distress:	The smell, the heat, and the unavailability of anything to buy. (51) The conditions were filthy. Cleaning maggotty fridges is hard work. (90)
Elation:	When we arrived at Tindall airport we were greeted by a well organised team. It was great to see one of our staff members who lives at the base greet us. (21)
Enjoyment:	There's seven of us hanging onto this little tree. Butch came past in his boat and rescued us. He was just the biggest lifesaver. (60)
Excitement:	The current was so strong the boat was difficult to steer. Stevie was screaming and the dog was jumping all over the place in panic. I arrived at Christine's house stressed to the maximum. (55)
Fear:	It was a disaster. This flood has taken away everything. The police came and told what diseases the flood could carry. I got scared for the five kids and I thought as we left we might get all washed away and drowned in the car. It was scary. (109)
Hope:	It was also a time when new friends were made. Everyone helped someone else no matter how bad things were for them. It was an equaliser of people. Out of adversity comes opportunity and I think we will be a better town for it. We are healthy and we are alive. We live in a wonderful part of Australia and the 1998 flood will add to the character of Katherine and her people. (135)
Loathing:	It was now Thursday and I had been at Kane's place for six days. This was long enough to test our friendship and I was getting a little homesick. Kane and I had argued and were not talking to one another. All I wanted was to go home. (10)
Love:	Katherine mob thanks and loves you. To the Government workers, police, firies, health crowd, many suffering losses permanently, thank you. (8)
Sadness:	It was heartbreaking for me as I lost things that were very precious including photographs of my mother who had passed away the year before. I know I will always have memories, but the photographs are irreplaceable (116). As Shaun closed the gate on the trailer he said "there goes 30 years of my life in Australia". (135)
Sorrow:	The flood was a time of hardship and sorrow. People lost so much.
Surprise:	We came across people panicking and evacuating the community. People were getting out and braving the murky floodwaters and swimming to safety. (115-116) When the water reached the door it slowly seeped in but when it reached the louvres it was like a dam opening up. It was even bubbling up through the floor! The disbelief turned into numb acceptance. This was something we could not control. (47)

Table 2: Personal emotional responses in the 1998 Katherine-Daly flood (The Katherine's Comin' Down, 1999)

human emotions evinced and needing to be controlled to maintain high levels of productive performance, include: *anger, concern, disgust, distress, elation, enjoyment, excitement, fear, loathing, love, sadness, shame, and surprise*. Virtually the whole range of core human emotions were experienced during the Katherine and Daly Region flood. An emotional competencies framework is provided by Goleman (1998, 26-27) to which the interested reader should refer.

Table 2, Personal Emotional Responses in the 1998 Katherine-Daly Flood, captures examples of these reflecting the complex web of human consciousness. The extracts are taken from *The Katherine's Cumin Down* (1999) and seek to

convey the essence of the behaviours and emotions of those experiencing the 1998 Katherine flood. The figures are the page numbers at which the quotations appear. The manner in which people react to situations reflects their individually unique make-ups and personal perceptions. All of the strain characteristics noted in Table 1 were manifest in the flood responses and behaviours observed.

Table 3, profiles Core Characteristics of Traumatic-Event Robust Persons. This summary profile reveals that both intelligences and emotions are critical components of effective personal trauma-adaptive mastery and disaster-coping thinking and actions.

However, the trauma robustness of the

Core characteristics of Traumatic-Event Robust Persons

Physical fitness and stamina: A sound level of physical fitness and endurance matched realistically to demanding circumstances.

Mental stability: A robust, well cared for, mental state, with no evidence of mental abnormalities.

Emotional intelligence: Sophisticated awareness of emotional states in self and others, and adequate self-managed control of personal emotions.

A predisposition towards proactive optimism: Maintaining a hopeful, forward-looking approach and making the best of the situation.

An 'openness to new experiences' component of overall intelligence: The capacity to adapt effectively to changed (and quickly changing) circumstances without undue stress.

A 'conscientious' approach to thinking and doing component of overall intelligence: Meticulous attention to what matters most to managing a situation. Knowing how best to think and act.

A 'naturalistic', or native cunning and mastery of the environment, component of overall intelligence: Practical or 'street-wise' intuitive knowledge and know-how of a natural and/or technological environment.

An overall sense of commitment, valuing the tasks undertaken: A sense of mission, or purpose, that the tasks undertaken are necessary and needed.

Table 3: Core characteristics of traumatic-event robust persons

Parameter	Dimensions	Comment	Research
Addiction & addicts	Drugs of dependence	Sudden withdrawal	Intervention management
Antisocial behaviours	Protecting vulnerability	Anti-criminal behaviour	Community values
Communications	Diverse	Multi-faceted	Core messages
Coping	Adaptable	Personality	Modify?
Disaster coping Bureaucracy	Normal & 'abnormal' working	Holistic functioning	Realism in the future
Disbelief	Complacency	Cultural	Mind-closure
Ekistics	Settlement systems	Inter-relationships	Human system dynamics
Human inertia	'Tyranny of the status quo'	Becoming pro-active	Openness to the new and different
Ignorance	Cognition	Lack of concern	Education & training
Leadership	Contingent	Followers	Paradigm
Management	Chaos theory	Ad-hocracy	Contingency
Mind-sets	Conditioning	Cultural	Openness
Multi-cultural competencies	Accommodating diversity	'Houses of Babel'	Multiple languages
National defence	Military dependence	Final authority	Defence & civilians
Obedience	Compliance	Social control	Authority acceptance
P.T.S.S	Poly-dimensional	Clinical diagnostics	'Classical' protocols
Power	Political	Availability	Direction
Technocrats	Skilling	Diverse	Training & experience
Volunteers	Nature	Motivation	Recognition
Warnings	Intelligibility	Responses	Criticality

Table 4: Key psychological issues and problems – Katherine flood

majority of the population notwithstanding, it is important to recognise that those in the remaining sector of the population (c. 20%) will experience a variety of adverse reactions up to and including severe and lasting mental

malfunctioning (Ursano, McCaughey and Fullerton, 1994; Paton and Long, 1996).

For many, the impacts and losses experienced in such events as the Katherine and Daly Region Flood 1998 will have lasting personal repercussions.

Research confirms that up to 15% of such populations may be affected adversely for longer than a year, many for life (McMillan et al. 1997). Once the immediate reconstruction phase is over, it is important not to forget that hundreds of people may require advice and counselling to help with their post-flood lives. Providing such support in the diverse, scattered and remote communities of the Katherine District over many years to come is a challenge to the providers. A small percentage of this group may be seriously mentally scarred for life.

Table 4 summarises Key psychological issues and problems—Katherine flood. The concerns noted are all worthy of further consideration and research.

Conclusions

The human behaviours of residents impacted by the 1998 Katherine-Daly Flood reflect a full range of human emotions and trauma-coping and response characteristics. They evidenced, overwhelmingly, the basic survival qualities of a robust majority of the population, in a possibly typical, cohesive-under-stress, Australian community. The attributes and needs of the less disaster-robust and more mendicant minority of people, were also a focus. Notably, many important lessons can be derived from the study of and reflection upon such an overwhelming catastrophic experience.

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New Books

Cross-Cultural Risk Perception: A survey of Empirical Studies

Edited by Ortwin Renn and Bernd
Rohrmann
Kluwer Academic Publishers
Dordrecht, 2000

This book is the thirteenth and the most recent in what has been an outstanding series of books published by Kluwer since 1986. The series of books (called *Technology, Risk, and Society: An International Series in Risk Analysis*) has been at the forefront of the move towards the application of risk management to environmental and disaster management. The quality of the series has been outstanding and this release strengthens the suite.

The focus is on what risk perception studies can offer to policy makers, risk experts and interested parties. It has brought together the leading practitioners in the field and showcases their empirical work from around the globe.

Of particular interest to Australian disaster management practitioners is the section reporting the work Bernd Rhor-

mann has done in Australia. Bernd (b.rhormann@psych.unimelb.edu.au) has been working with disaster managers in Australia since about 1992 when he came to the University of Melbourne. Since that time, he has contributed significantly to improvements in our approaches to risk management. The work reported in this book draws largely from work on bushfires, but the findings are about management and can be translated across hazards.

The book is not an easy read, but the matters it deals with are not light. It moves from a critique of public policy failures, through a review of current trends, to reports on empirical work undertaken around the world, and concludes with some very useful implications for risk management. The book is worth the first chapter alone for the comprehensive cover of the experts in the field summarizing 'who believes what and why'.

The cream on the cake lies in the conclusions which can be drawn from the reported research. The conclusions reached are not merely the all too often seen tacking on of a preferred ideological position. It is practical and useful advice to practitioners. Instead of getting our

fingers burnt again, we can use the lessons reported to guide our planning

One particularly interesting point is the significant degree to which the lessons reported parallel the principles and suggested techniques in the draft Australian New Zealand Standard on Environmental Risk Management. The work reported in this book and the Environmental Risk Management Standard will add depth to the Risk Management approach to Emergency Management, as there is much of relevance to transfer. It is not an easy task, but surely it is a worthy one.

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John Salter worked with Emergency Management Australia for over ten years. He now works with the City of Adelaide as an Environmental Manager, with the University of New England as a course coordinator of *Planning for Civil Care and Security* (a core unit of their emergency management degree), and as a consultant with Geo-Eng Australia.