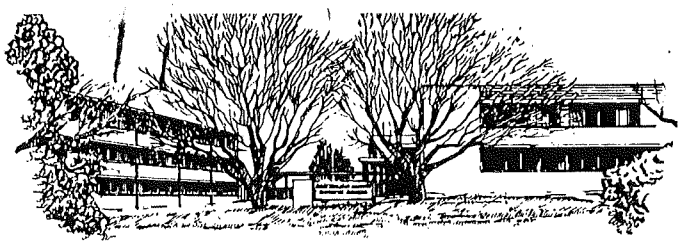
THE MACEDON DIGEST



Vol. 2 No. 4 December 1987

Produced by the Australian Natural Disasters Organisation

A NEW AUSTRALIAN DISASTER PLAN

On 24th August, the Director General, Natural Disasters Organisation, approved a new Australian Disaster Plan, which has the abbreviated title of AUSDISPLAN. This was a milestone in a program which began early last year, with the aim of revising all of NDO's plans.

The aim of AUSDISPLAN is 'to detail procedures for co-ordinating the provision of Commonwealth Government physical assistance in the event of a disaster'. This is a different kind of aim from those of the former National Disaster Plans (NATDISPLANS). It is not limited to any particular type of disaster or disaster-related operation, whereas each of the old NATDISPLANS were specific in this way. The main body of AUSDISPLAN, contains provisions which are applicable during any type of disaster and is supplemented by annexes; each one referring to a particular type of disaster or disaster-related operation.

AUSDISPLAN directly replaces three of the former NATDISPLANS. They are:

a. NATDISPLAN CYCLONE - (Edition 5) dated September 1979;
b. NATDISPLAN IMPACT - (Edition 1) dated August 1980; and
c. NATDISPLAN RELOCATION - (Draft) dated February 1981.

It also replaces some of the old NATDISPLAN SPRED (Provisional) dated January 1983, which dealt with all aspects of space re-entry debris. Part of NATDISPLAN SPRED, covers how the Commonwealth would assist a State or Territory to cope with a disaster, caused by re-entry debris. This part of the plan has been incorporated into AUSDISPLAN. The other part is mentioned later.

AUSDISPLAN also includes reference to some topics, which previously were only dealt with in NDO implementing instructions. For example, the plan now includes an annex describing the functioning, operating responsibilities and activation procedures for the National Registration and Inquiry System. It also includes an annex describing the procedures for requesting and conducting cold front reconnaissance flights, during the fire weather season in the south-east of the country.

Largely as a result of Chernobyl, the international community recently agreed on a Convention of Early Notification of Nuclear Accidents (CENNA), and a Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (CACNARE). Both of these conventions have implications for how Australia might handle radiological accidents; it was therefore decided to include an additional annex dealing with this topic.

The plan has been produced in such a way that, if a need arises in future to include information related to a specific type of operation, it can simply be added as another annex. One which is already planned is an annex on exotic animal disease emergencies. This will be based on the Summary Document, which is part of the Australian Veterinary Emergency Plan (AUSVETPLAN). The Summary Document was recently issued in draft form by the Exotic Diseases Sub-Committee, Bureau of Rural Science.

The former NATDISPLANS referred to Defence Force Assistance to the Civil Community; AUSDISPLAN does also. However, this section of the plan has been expanded, to explain how it fits in with other arrangements by which a disaster-affected State or Territory may obtain Commonwealth assistance. It mentions the authority of some senior representatives (such as Telecom State Managers) to commit resources, as well as the National Search and Rescue Manual, the Australian Veterinary Emergency Plan and the National Plan to Combat Pollution of the Sea by Oil.

While this revision was being carried out, the status of Norfolk Island was changing. The Norfolk Island Government now has full legislative and executive responsibility, for civil defence and emergency services on the Island. This means that to obtain Commonwealth disaster assistance, the Island's government now comes direct to DG NDO, whereas previously it had to work through the former Department of Territories. This change in procedure has been included in AUSDISPLAN.

NEW COLLEGE DIRECTOR

With the impending retirement of Brigadier Ian Gilmore as Director of the Australian Counter Disaster College, Mr Roger Jones has been appointed as the new College Director. Roger, who was Deputy Director of the College from 1975 until 1985, has for the past two years been Deputy Director of the Office of the Co-ordinator in Chief of Disaster Services. In this appointment, he has been primarily responsible for completion of the reviews undertaken, following the 'Ash Wednesday' fires of 1983, and for developing and implementing the new emergency management arrangements for the State of Victoria.

Roger was born in Fremantle, Western Australia and graduated from the University of Western Australia. After teaching, he joined the Australian Army and served in a variety of appointments in Australia and Papua New Guinea. He was appointed the first Principal Staff Officer (Operations), with the rank of Colonel, in the then newly formed Natural Disasters Organisation. In this appointment, he was responsible for the establishment of the National Emergency Operations Centre and participated in the Commonwealth response to Cyclone Tracey and other emergencies. He resigned this appointment to join the College in 1975 as Deputy Director and Chief Instructor where he was responsible for doctrine development and the implementation of the instructional program.

DATA BASE

A disasters data base has been developed at the Hawthorn Institute of Education in Melbourne. It contains approximately 400 brief descriptions of various disasters that have occurred throughout the world, over the past 2000 years. It is designed to be used as a key component in a large range of classroom activities, for both primary and post-primary students. The package has been thoroughly trialled in many schools, with teacher contributions to the development of the package. The software is available for the IBM PC, on IBM JX, or Apple IIe. The cost of this package, which includes the database and a 50 page Teacher's guide, is A$45.

To order (stating which computer will be used), write to:

Dr Colin MacPherson
Centre for Computer Education
Hawthorn Institute of Education
442 Auburn Road
HAWTHORN VIC 3122
Australia,

enclosing a cheque for A$45, made out to:

'Hawthorn Institute of Education'.

VISIT

In the June 1987 edition of TMD, it was reported that the Reverend John Hill, of the Victoria State Community Recovery Sub-Committee, would be attending a workshop in Boulder, Colorado, USA in mid July. The Workshop covered hazards research and applications, with the 1987 theme being 'Creative Approaches to Hazard Mitigation and Disaster Recovery'.

Reverend Hill has provided the following report on the workshop.

'Since Gilbert White, a geographer with a deep interest in the causes and effects of natural hazards, established his Research and Applications Center at the University of Colorado in 1976, the annual conference has grown in size and significance. This year, the Eleventh Conference involved 262 participants, with six members of the Victorian Community Recovery Committee attending and presenting papers at both plenary and workshop sessions, around the particular theme of Community Recovery from Disaster. These were Val Gilpin and Pat Murdoch, both educational psychologists involved in SES training in Victoria; Rob Gordon from the Royal Children's Hospital (whose articles will be familiar to readers of TMD); Helen Hill and Sue Gray who both worked as Community Development Officers, following 'Ash Wednesday' fires; and John Hill, a 1981 Churchill fellow who has had a long term involvement with recovery planning and management in Victoria. All of the presentations were received with enthusiastic interest.

This conference is a most significant one, because it brings together participants from every aspect of the disaster spectrum. The pure researchers from universities and research centres working in areas like wind engineering, seismic microzonation, nuclear winter, and training of primary care workers, attended. The abstracts of 34 completed research programs and 14 new research programs were presented and outlined; the opportunity to discuss these programs and their implications, was provided by the workshop format of the conference.

However, whilst the researchers, scientists, sociologists, and engineers made up a fair proportion (probably 50% of the attendance), the balance came from the 'practitioners'. People involved in planning and management at federal, state and county levels and from the voluntary sector, made up the rest. It was this mix which gave the conference a rich diversity. Since in Australia, 'researchers' and 'practitioners' rarely meet, let alone share their insights, it was stimulating to be part of a conference where this was a particular feature.

It is clear that in the U.S., the trend is towards equipping the practitioners (those involved in the planning, impact and recovery processes) with skills in the management of disaster, in an integrated and comprehensive way. Local community involvement was stressed. Perhaps it was for that reason that the Australian contributions struck such a chord, with both researchers and practitioners. The basic concepts underlying our presentations were:

(a) that disaster affected people will, given the information, back-up resources and personal support, make well informed personal and organizational recovery decisions; and

(b) that communities recover best when they manage their own recovery (this view had been hard won from the experiences of the 'Ash Wednesday' Bushfires). This concept received much affirmation and encouragement.

I believe that Australia, and particularly the college, should always aim to have a participant present at such a conference. The opportunity to return with first hand knowledge of the current research (from the researchers themselves), and to build a reliable overseas network with people of similar interests and concerns, is one that should not be missed.'

A summary of Reverend Hill's full report, is available from Ms Kerry Gartland at the College, or by contacting Reverend Hill direct (053 581131).

OZONE DEPLETION

Time magazine of 19th October 1987, reported on the effects of the depletion of the ozone layer. The earth is protected from the sun's ultraviolet radiation, by a layer of ozone in the stratosphere, some 15 to 50 kilometres above the surface of the earth. Recent scientific evidence suggests that man-made chlorofluorocarbons (CFC's), used amongst other things as coolants in refrigerators and air conditioners, for making plastic foams and as cleaning solvents for microelectronic circuitry, reach the upper atmosphere and set off chemical reactions that rapidly destroy ozone. Scientists fear that if the ozone layer diminishes over populated areas, as it has over the Antarctic, serious health consequences could occur. Ultraviolet radiation, a form of light invisible to the human eye, causes sunburn and skin cancer. It has also been linked to cataracts and the weakening of the immune system. Without ozone to screen out the ultraviolet light, such ills are expected to greatly increase. The U.S. National Academy of Science estimates that a 1% drop in ozone levels, could cause 10,000 more cases of skin cancer each year in the U.S.; a 2% increase.

FEATURES

WORKERS' RESPONSES TO DISASTER

This is the seventh article in a series on Human Responses to Natural Disasters, by Ruth Wraith and Rob Gordon from the Department of Child and Family Psychiatry, at the Melbourne Royal Children's Hospital. In this article, the personal responses of disaster workers and their families are examined.

One of the common myths or assumptions about disaster, is that those working and helping are unaffected by their experiences. It is frequently said of those trained to do specific tasks, 'They know how to deal with the stress so it does not affect them'. It is true that training, clear role definition and being a member of a supportive group, decisively alter the impact and management of personal stress. However, by definition, a disaster involves great human suffering, loss, destruction, disruption of normal patterns and questions about the meaning of life. While workers may not be directly involved in loss and suffering, their concern for those they are helping and normal human empathy, implicate them in the experience of the 'victims'. Anyone in the disaster situation is involved in the sense of meaninglessness, that accompanies a detailed knowledge of events and shows in the disorientation and regret for the destruction that has occurred. All workers, therefore are presented with a set of stresses similar in many ways to those of the victims.

Workers and organisations often evolve informal methods of managing these stresses, although there is at times also a strong tendency to deny that they exist. Stress itself is always present, even though it may not lead to any adverse consequences. Whatever the training and prior experience, it is wise to remember the findings about troops in combat conditions; each man has his breaking point and continued exposure will eventually take its toll. This applies equally to combatant disaster workers, those handling registration, enquiries and other administrative and service procedures throughout the duration of the reponse and recovery periods. We propose to outline some of the factors that contribute to the stress on workers in a disaster, to describe effects on individuals and their families and to outline ways in which they can be managed.

Stresses and Problems of Disaster Work

Situational factors make disaster work difficult. They include obvious ones, such as coping with people in distress, with death, damage and destruction. Other situational factors include high pressure, competing and sometimes incompatible demands, long hours, unfamiliar tasks, and new performance requirements, the need to rapidly establish effective working relationships with a large number of previously unknown people, rapidly changing conditions, inadequate information and resources. These and other factors render the disaster situation complex, ambiguous and unfamiliar. Skills and training have to be adapted to meet the requirements; sometimes there is no right answer, forcing workers to make unpopular decisions.

Secondly, there are *organisational factors*. These are overlooked at times, but in a disaster, combatant and recovery organisations are challenged and may react maladaptively. There is often competition and conflict between agencies or workers, power plays, or scapegoating for the mistakes of others. When organisations themselves are under stress, deficiencies are exposed and lead to a variety of strategies designed to combat them. Often they do not take into account the needs of the workers themselves, and increase their burden.

Thirdly, there are *personal factors* associated with worker stress. These include adequacy of training and preparation, both personal and professional support, success or fulfillment of the work itself and the role of the worker's personal past history and ambitions. There are also concerns associated with the worker's perception of his own performance in crisis conditions, and more far-reaching issues, that may be aroused by his disaster experience and contact with victims, for his personal philosophy of life. This may include a new evaluation of the meaning of life, property and relationships, and even changes in his own self concept.

The *time scale* is also an important factor in assessing worker stress. Some roles are short and intense, such as the combatants; others, notably recovery workers, may involve prolonged but more restricted contact. These may be equally demanding, though in different ways. Stressful experiences, if not properly dealt with, accumulate. Hence workers who have been involved in one disaster may find each subsequent one increasingly stressful, even though they appeared unaffected in between.

These are some of the more general factors that make disaster work a particularly challenging and stressful field. In any given disaster, there will be many other specific situations which will constitute problems for the workers involved.

Characteristics of Stressed Functioning

Stress is involved in any work task. However there is an optimum level of stress which stimulates, arouses and motivates the worker. It prevents boredom and provides the conditions for learning and job satisfaction. This level of stress promotes efficient and effective work. But there is no upper limit to stress and once it goes beyond a certain level, work performance deteriorates and personal wellbeing is affected. At this point, stress has increased to the point of becoming distress.

The boundary between stress and distress varies greatly from one person to another, and in the same person from one period or situation to another. Therefore, the first difficulty is to know when stress levels have become too high. This is only one of the decisions that become blurred in conditions of stress. Generally people under pressure tend to work harder, worry more, become less efficient, blame themselves or others and experience a deterioration in their skills and performance. They become less objective about themselves, have trouble organising, planning, anticipating or setting priorities for themselves or others. People tend to blame themselves or others for problems, rather than addressing themselves to solutions; important issues are postponed in favour of less important but more straightforward tasks. Stressed workers often lose the ability to put their own behaviour in perspective and can react angrily to suggestions from others to rest, take a break, or accept help. The very skills and experience that would help handle the demands of the job, are interfered with by stress. This sets up a vicious cycle, whereby increasing effort adds to stress, instead of reducing it.

Organisations and groups are also adversely affected by excess stress. Communication and decision-making processes become inefficient, more time is spent on maintaining the system and dealing with internal problems, at the expense of the service itself. The performance level is reduced in the field and this serves to further increase the stress levels.

It is also possible for delayed stress effects to occur both in individuals and organisations. Although a crisis may be adequately managed at the time, afterwards less demanding problems seem overwhelming, are not well handled or excessively deplete resources. An essential element of stress, is that its effects build-up over time and are therefore difficult to define, as is the transition from stress to distress. Hence, the most effective tactic in dealing with it, is by preventative measures before it builds up, and by ongoing management while it is present, rather than waiting until it is clearly causing problems.

Effects of Excessive Exposure to Disaster Work

While many people appear unaffected by disaster work, a wide variety of *personal effects* can be observed, among those who have become stressed by exposure, which exceeds their threshold of coping. They include:

- ★ Physical effects; fatigue, lassitude, increased vulnerability to illness;
- ★ Emotional effects; depression, anxiety, impatience, irritability, aggression, anger;
- ★ Personal or professional disorientation, confusion,

uncertainty; this leads to interpersonal tensions, rivalry and difficulties in team functioning;

- ★ Over-enthusiasm, over-commitment to the experience, inability to set limits on oneself, ambitiousness, unrealistic evaluation of self and others;
- ★ Loss of professional and personal skills and competence
- ★ Inappropriate humour, denial of painful realities, withdrawal from the support of colleagues; and
- ★ Longer term effects; burn out or exhaustion, stress accumulating from one disaster to another, loss of interest or motivation, sometimes a year or more after the disaster leading to resignation or changing job.

These effects are not confined to the individuals involved, but also influence those closest to them, causing *family effects*. The most direct of these are called *transmission effects*. In this case, the stress is transmitted directly to family members, by the alterations in the worker's behaviour. For instance, the worker may become irritable, impatient, tense and preoccupied. Family members may feel unfairly treated, left out or angry and anxious with the worker, because of what has happened. Communication may decrease, children may become resentful or attention seeking. Fears, anxiety, sleep disturbance, inability to separate and the reappearance of earlier behaviour patterns, are all indications of the impact of transmission effects. Often these problems are easily dealt with, because the family identifies them as related to the disaster and they can employ their problem-solving skills in resolving them.

A less direct way for the worker's disaster experience to influence his family, is through *repercussion effects*. These denote adaptations to the unresolved effects of the disaster work. Often they are reactions which occur some time after the disaster and the connection may not be obvious. For example, a worker's preoccupation during and after the disaster may mean that he or she will be inattentive to developing needs of the family. The family may then reorganise itself to cope without the worker, or the members may develop problems of their own, and further aggrevate the relationship to the worker. Another example is the effects of the worker's value system undergoing change, as a result of his disaster experience, with the spouse remaining as before. This may result in development of a significant gap in their communication.

These problems are often only fully understood, when the sequence of repercussions from the actual disaster is recognised. They can then be seen in a wider perspective, rather than as the responsibility of the affected family member.

The third pathway is by *induced effects*. They are problems or alterations in family life, caused by the interaction of the disaster work with other psychological factors. The resulting behaviour may then appear to have no relation to the disaster, and lead to uncertainty and confusion. The disaster may evoke fantasies in young children, which distort their understanding, but are not communicated. They may become frightened of their worker parent for instance. The stress and tension associated with the work may lead to the spouse re-experiencing other past events involving him or her in feelings, which may mean a need for support and help, at the time when the worker feels a right to expect it. For instance one worker's wife was put in touch with an episode of sexual assault in her early life, by the disaster evoking the same feelings of fear and helplessness. This altered their relationship. It was several years before she shared this with her husband and he could begin to understand why she had been feeling the way she had. In such cases, it is easy for problems to be seen as due to unfortunate changes in the personalities of the family members, which alters how they feel about each other. The fact that such changes may take several years to reach sufficient intensity, so as to disrupt existing patterns, does nothing to compensate for the resultant difficulties and misunderstanding.

Families are complex, dynamic systems and an important experience for any one member will mean essential changes for the whole family. If this is recognised, then stresses and problems can be more easily understood and coping skills and problem-solving methods can be used to deal with them, or help can be sought if necessary. Comparing and contrasting experiences with other workers and families, will often help in this process.

Handling the Effects of Disaster Work

Preventative measures are the most effective way of dealing with the effects of disaster work. This means helping workers to resolve the emotional demands of their experiences, as they occur. The best means of achieving this are:

Training and information about normal psychological responses to disaster work, delayed reactions, physical effects of stress and how to recognise signs of abnormal response. This should also include simple stress management techniques, measures to resolve these problems. It should be made available to members of workers' families, as well.

Psychological Debriefing for workers, as a routine part of their service. Debriefing refers to the process of talking about experiences, feelings, and actions, so they are reviewed, placed in perespective and integrated into the worker's previous experience. The emotional impact is lessened and the likelihood that the worker's behaviour will be altered is reduced. Talking about things, clarifies them and helps those involved, to identify what they are feeling. Only when this has been done can they set about resolving them.

Debriefing is best done in groups of those who have worked together, conducted by someone with training in the process, who may or may not be a worker. Groups allow members to compare and contrast their experiences; this may be the only way they are able to evaluate the normality of reactions to unusual situations. Social support grows out of group context; it helps people feel able to confront painful experiences and overcome feelings of aloneness. Apart from dealing with the emotional impact of work experiences, debriefing can also assist in clarifying roles, setting priorities, evaluating performance and learning from the events.

Opportunities for the families of workers to debrief are also beneficial, although these may be facilitated in more informal settings, such as social functions.

Organisational support and recognition is an essential ingredient in reducing adverse work experiences. Organisational tensions are often identified as more debilitating, than problems encountered in the line of duty. Workers will often willingly make great sacrifices and think nothing of it, if they receive the appreciation of their seniors. However, if this is lacking, or replaced with fault finding, longstanding bitterness develops which undermines commitment to the job and promotes burn out.

Follow up is important, since some reactions may only be evident up to two years after the event; the workers involved may require assistance to recognise the relationship with the disaster.

Access to trained mental health workers, to consult the services in developing worker support programmes and to provide flexible non-clinically oriented assistance where required, is another resource which should be available. Although most problems will be well within the normal range, it is helpful for workers not to feel they have to be responsible for evaluating problems outside their sphere of competence.

Appropriate work practices need to be developed, based on an understanding of the stresses and demands on workers and the kinds of needs that arise. This may mean giving consideration to such issues as rotation through different types of jobs, limited on-duty time, extra support or supervision at times and planned recreation on the job. In this way, a particular disaster setting may require adjustment to normal routines, to maximize worker support.

Conclusion

Disaster work of all types places great demands on those involved. While most people cope with them, some people suffer short or long term adverse effects. A greater understanding of these effects can lead to developing procedures and services, that will benefit all those involved in the work,

and their families. They include, information and training in responses to disaster and other high stress work, psychological debriefing, effective support and recognition by the worker's own organisation, follow up, access to trained mental health workers and work practices designed to minimize stress and maximize support, and recovery from the effects of such humanly demanding work.

Continued in March 1988 TMD - 'Community Responses to Natural Disaster'.

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PREPLAN

In the September edition of TMD, Roger Good from the New South Wales National Parks and Wildlife Service, introduced PREPLAN, the computer management technique for bushfire hazard and risk assessment. He concludes his article, by examining aspects of hazard and risk assessment, resource data bases and the acquisition of information.

Hazard and Risk Assessment

Hazard and risk assessment is most applicable to the urban bushland interface, in the context of urban planning. But hazard assessment must take account of all those natural factors which contribute to wildfire behaviour, these being basically biophysical factors of the bushland areas. These biophysical factors include fuel and terrain characteristics and weather parameters. Fire behaviour is measured as the rate of spread of the fire front, and as mean flame length under the conditions prevailing at any one time. Flame length is a reflection of fire intensity (energy released during burning), so wildfire hazard can be considered as flame length hazard or rate of spread hazard. The rate of spread hazard is the most significant to fire suppression authorities, but to planning authorities it is the flame length hazard (intensity) which is the most applicable. The higher the intensity of a fire, the greater the amount of radiant energy released to the fuel, in advance of the moving fire front. If the 'fuel' happens to be housing or other features of the built environment, the intensity level will determine to a large degree, the impact of wildfire at the urban bushland interface. Either measure of hazard is dependent upon many variables which may change continuously, or change from one site to another. Vegetation and fuel characteristics will change from site to site, while weather factors will change as a continuum. The assessment of hazard is therefore not a 'one off' determination, to which a static and finite rating of hazard can be made. In Kosciusko National Park, factors change from mild fire weather, to high fire weather. Low flame length and rate of spread hazard levels exist under mild conditions, except for one or two sites, where fuel characteristics or terrain characteristics exhibit a greater influence on hazard levels at that time. As the seasonal conditions deteriorate, the high fire hazard levels spread across the bushland. This technique of hazard assessment can be applied to any area under changing seasonal conditions, to identify specific sites of high hazard rating; measures to ameliorate the hazard can be planned. If developments do not exist in the vicinity of the sites of continuous high hazard, Councils and other land planning and management authorities can make quantifiable assessments of hazard and the afficacy or otherwise of approving a development in such an area.

Very few areas will exhibit high hazard levels under all vegetation, fuel terrain and weather conditions. But where these areas are identified, no development approvals should be given. In other areas where hazard levels exist for lesser periods of time, be it during a fire season or over a number of fire seasons, Councils can determine the level of *risk* to which a potential development may be exposed and *limits* of risk acceptable to Councils, the public, and possibly insurance companies. Risk is therefore the probability of a hazardous wildfire event occurring, and the frequency of such events re-occuring in the same area over time.

Hazard and risk assessment is therefore a dynamic process; to enable all the changing variables to be integrated with a huge volume of resource data, computing facilities are a requirement.

Resource Data Bases

The sheer volume of data to be compiled and stored for use in a PREPLAN type program, may initially appear daunting and the cost of data collection prohibitive. But this is not the case, even for a very large local government, or national park areas. The establishment and data acquisition costs should be considered, in comparison with the value of developments, which may be affected by an unpredicted wildfire event. For example, in South Australia during the Ash Wednesday fires, 383 homes were destroyed, along with various other developments; the total replacement costs being in the order of $200 million.

A hazard and risk assessment programme being implemented at the present time, will cost approximately $250,000, plus the cost of suitable computing facilities. This amount is a small cost, when the total land area for which a data base is being compiled, is considered. The area is almost 1 million hectares, with the data being collected on a grid cell survey base of 200 x 200 metres, providing many millions of data entries on terrain, vegetation, soils, geology, fuels, land tenure, land use patterns, access and social and historic factors. While this resource data provides a base for the prediction of fire behaviour and hazard assessment, it also provides data applicable to other land use planning issues including environmental impact assessment.

The assessment of fire management strategies under the Environmental Planning and Assessment Act (1979), may be a requirement in many areas in the future.

The capacity to integrate resource data through the PREPLAN program, is assisting the National Parks and Wildlife Service to assess likely impacts of some of its fire management strategies, including fire exclusion and prescribed burning. As most local government areas are proclaimed bushfire districts under the Bushfires Act (1949-1970), Councils may similarly be required to take account of likely environment impacts of their fire suppression and control techniques, and will need to be able to quantify these in the same manner as the assessment of hazard and risk, to the built environment.

Resource Data Acquisition

Terrain data is compiled from topographic maps, through the machine digitizing of contours. In the modelling program, the computer calculates slope and aspect from the digitized contour data.

Where vegetation maps exist, these can be digitized in the same manner as that of topographic maps. Where little or no vegetation data exists, field surveys of selected sites is essential. The vegetation types at the survey sites, can then be readily extrapolated to similar sites, through computing a technique called gradient modelling. Survey of every grid cell over the entire study area (Park, Municipality, Shire, etc.), is not required to determine the native vegetation in any grid or defined area. In areas such as the Adelaide Hills where the vegetation has been grossly modified and changed, the interpretation of aerial photography, provides for the annual changes in land use and non-native vegetation areas.

Fire behaviour is a function of the amount of fuel available to burn during the passage of a fire front, and different vegetation types contribute varying amounts of litter to the fuel load. The rate of accumulation of litter fuels and the total amount of available fuel within each arid cell, is determinated by the collection of a limited number of field samples in each vegetation type.

For example, in Kosciusko National Park, approximately 1000 sampling sites have provided sufficient data to model fuel levels across the entire park area of 640,000 hectares. The fuel model with PREPLAN, can account for variations in fuel accumulation rates as a response to slope, aspect, elevation, moisture and temperature gradients. The fuels data is therefore integrated with vegetation, terrain and fire history data, from which the PREPLAN program can calculate day-to-day fuel levels. This integration of data bases also provides for the prediction of the month-to-month, or year-to-year fuel accumulation rates after a fire event, providing an assessment of the actual fuel hazard existing at any time. An accurate

determination of the fuel hazard is essential, for both wildfire behaviour prediction and prescribed planning, for hazard fuel reduction.

Soil type maps may be of use in some planning programs, but in hazard assessment, an erodibility rating for each soil type within a range of topographic classes, is essential. Erodibility data enables the prediction of the hazard and risk to catchment stability of any fire event, and the consequent removal of catchment ground cover. The fuel accumulation rates can be integrated with soils and terrain data, plus fire behaviour predictions, to calculate minimum ground cover litter levels, to ensure catchment stability. For catchments serving urban water supplies, the management of fires for soil stability is an obvious requirement, for which PREPLAN type predictions and simulations can be a guide to hazard assessment and effective management.

To finally determine a risk rating, social, historic, cultural and economic factors which are affected by fire, need also to be stored in some format. Much of this data can also be readily digitized, but site-specific data may have to be directly key punched to the machine, from Council records. As most Councils and Shires have existing computing facilities, much cultural and social data would be already stored and available for input to a PREPLAN hazard and risk assessment program.

Availability of Preplan

The N.S.W. National Parks and Wildlife Service, in association with the Australian National Parks and Wildlife Service, the South Australian Department of Environment and Planning and the Western Australian Fisheries and Wildlife Service, have committed considerable funding to PREPLAN research, development and implementation. But the program is available to other interested organisations. Expressions of interest can be made to the project co-ordinator, Mr. Roger Good, National Parks and Wildlife Service, PO Box 733, Queanbeyan, N.S.W., 2620.

EDUCATION

ACDC Program - 31 January to 30 March 1988

Counter Disaster Planning (1090)	31 Jan - 5 Feb
Hazard Analysis (1091)	7 - 12 Feb
Comprehensive Disaster Management (1092)	14 - 26 Feb
Disaster Response Management (1093)	28 Feb - 4 Mar
Disaster Recovery Management (1094)	6 - 11 Mar
Recovery Management Workshop (Public Health Aspects) (1103)	14 - 18 Mar
Hazard Management and the Environment Workshop (1078)	21 - 25 Mar
Recovery Management Workshop (Engineering & Town Planning Aspects) (1097)	27 - 30 Mar

Details about these activities are contained in the ACDC 1987/88 Handbook; or contact the College direct on (054) 26 1205.

Australian National Oil Spill Conference - Melbourne, October 1987

The second national conference on the prevention and control of oil spills was held in Melbourne from 7-9th October 1987, jointly sponsored by the Federal Department of Transport and the Australian Institute of Petroleum.

The conference focused on the need for co-operation between all bodies involved in the handling, movement and storage of oil. Papers were presented under the headings of Environmental Issues, Response Planning, Response Operations, Management Issues and Organisational Issues.

The need for further environmental mapping of local areas, detailing where and the conditions under which dispersants might be used and the need for wide ranging field trials, was expressed by delegates. It was suggested that field work should focus on the effects of dispersants on individual species of corals, seagrasses and mangroves, so that selection of the appropriate dispersant, could be made well in advance of a possible oil spill impacting a coastal area.

The attitude of the petroleum industry is reflected in the stressing of *safety and efficiency* in all areas of oil handling, which in turn reduces the chances of oil spill. The training and updating of response staff in 'state of the art' oil spill handling procedures, was also emphasised.

The conference clearly demonstrated the sensitivity and concern of both government and private enterprise, to the need for constant vigilance and upgrading of planning, preparation, response and recovery measures, to ensure a minimum of oil spills in Australian waters.

International Conference on Dealing with Stress and Trauma in Emergency Services - 26/28 August, 1988, Melbourne, Australia.

The purpose of this conference is to bring together people with expertise and interest in assisting emergency personnel who are exposed to stress and trauma in the course of their work. This conference follows on from different series conducted in both the U.S.A. and Australia, addressing the broad topic of 'helping the helper'. This is an area in which emergency services have shown initiative to others in the health/welfare field.

This conference will explore the roles of education, counselling and research in understanding and combatting emergency service stress. Emphasis will be given to practical approaches and useable strategies. Cross cultural information will be encouraged.

The conference is designed for people involved in emergency work, eg. police officers, ambulance officers, fire fighters, SES workers, medicos, nurses, counsellors (psychologists, social workers, clergy), administrators and emergency support staff.

The conference format will comprise:

★ keynote and invited speakers;
★ individual paper sessions and workshop presentations; and
★ informal activities.

The conference will emphasize and facilitate opportunities for liaison and communication between delegates.

Invited speakers will include:

Dr. Sandy McFarlane Flinders University S.A., Australia	★ Long term effects of Ash Wednesday on firefighters.
Professor Jeffrey Mitchell University of Maryland, U.S.A.	★ Major educator and innovator of this field in the world. ★ Creator of critical incident stress debriefing teams.
Professor Beverly Raphael University of Queensland Australia	★ The effects of disasters on victims and emergency workers in Australia.

Individuals are invited to submit abstracts on topics related to education counselling, or research in emergency service stress. They must:

1. Complete a form, available from address below.
2. Include : a. tentative title
   b. 500 word abstract
   c. name, address and phone no.
3. Submit these by 12th February, 1988.

Address all correspondence and enquiries to:

Dr. Robyn Robinson
Conference Co-ordinator
Social Biology Resources Centre
139 Bouverie Street
CARLTON 3053
Telephone: (03) 347 8700
International: 613 347 8700

REFLECTIONS

In an article in 'The Age' of Wednesday, May 31, 1961, it was reported that the Mayor of Swan Hill had agreed to call a public meeting for the purpose of forming a disaster force. The Swan Hill Council was requested to form committees, to deal with emergencies caused by fires and floods. A disaster force was proposed to respond to these threats. Today, throughout Australia, thousands of State and Territory Emergency Service volunteers are frequently requested to assist in various humanitarian tasks, during times of natural and man-made disasters.

THE GREENHOUSE EFFECT
—1—

In the June edition of TMD, information was provided about research conducted by Dr. Barrie Pittock into the greenhouse effect. Dr. Pittock, of the CSIRO Division of Atmospheric Research, examined the physical and biological effects on Australia, by the year 2030. In this edition of TMD, he looks at the possible socio-economic effects on Australia, within the next three or four decades.

The changing climate is likely to have a number of socio-economic effects, the severity of which will increase with the rate of change, since economic costs are most serious when changes occur more rapidly than the design life of the systems concerned. An example would be the spillway design for a large dam. It should be emphasised that the following comments are very preliminary - improved estimates will be needed by engineers and scientists in the relevant fields.

The climatic and biological effects on crops will have important consequences for many rural communities. Some will be better off, others will be able to adapt by changing their farming strategies, with different scheduling of planting and harvests, change varieties of wheat, switching to some other grain crop, or from beef to sheep or vice versa.

However, some marginal areas will become uneconomic, and other areas will remain profitable only with large capital expenditure on equipment for irrigation or flood control and drainage, or changes in farm machinery and infrastructure. Significant population shifts could result from these changing circumstances.

Coastal management, depending on the magnitude of the sea-level rise, may be greatly affected. Remedial action could be extremely costly, with major capital works necessary to protect lowlying areas and specially water-front buildings, marinas, ports and industries sited near coastlines for cooling water or ease of freight handling. Beaches and holiday resorts may be badly affected.

Urban and rural water supply authorities will face major problems in allocating water, ensuring the safety of dams subject to greater peak river flow, and in planning for adequate water supplies under progressively changing conditions. Related to this is the management of hydroelectric generation, which may be particularly affected by reductions in snow storage through the spring and summer months. Ski resorts would almost certainly be adversely affected.

Conservation of animal and plant varieties will be a serious issue, as some nature reserves and national parks become increasingly inappropriate climatically for the species they were meant to protect. Loss of genetic diversity which might follow, could have long-term implications for plant breeding and medical research and development.

Domestic energy demand could also change significantly, with less demand for winter heating and more for summer cooling.

The Australian coal and chemical industries could also be seriously affected by any attempts to regulate production of greenhouse gases, either domestically or overseas, and by changing economic circumstances and product demand. It is likely that other local industries will also experience significant economic impacts, some favourable and others less so, due to changing competition and demand overseas. For example, it is presently widely believed that grain production in North America and Europe will be drastically reduced by the changes in climate related to the greenhouse effect. Initially this would be expected to increase the demand and prices for Australian grains, but if the economic effects overseas lead to a major economic crisis this may not follow in the longer term.

Finally, Australia will be faced with the question of what stand to take on the question of international regulation of fossil-fuel usage and the production of other greenhouse gases. International disagreements may well arise as to the most appropriate policies to be pursued, and the enforcement of any such policies. In view of the probable need to reduce fossil-fuel usage in an attempt to slow down the greenhouse effect, the issues familiar from the oil crisis - energy conservation, alternative (non-fossil fuel) energy sources and renewable energy resources - assume a new and more lasting significance.

Source: The Journal of the Institution of Engineers Australia, February 6, 1987.

THE GREENHOUSE EFFECT
—2—

The Melbourne *Age* of the 3 August 1987, reports that the tiny Pacific nations of Tuvalu and Kiribati could be submerged within the next 50 years, by a rise in global sea levels, induced by the greenhouse effect. These two nations consist entirely of low-lying atolls, and only have small areas above sea level. Sea level rises of just one metre, would make both countries uninhabitable, and leave 50,000 islanders homeless.

James G. Titus of the U.S. Environmental Protection Agency, has warned that the greenhouse effect could cause sea level rises of from 0.6 to 1.5 metres (see 'Greenhouse Effect, Sea Level Rise, and Coastal Zone Management', Coastal Zone Management Journal, Vol. 14, No. 3, 1986). He postulates that the warming created by the greenhouse effect, will cause sea level rises, because of expanding ocean water, melting mountain glaciers, and perhaps eventually, the melting of polar glaciers which will slide into the sea

EMERGENCY SERVICES COLOUR I.D.

The Standards Association of Australia (SAA) is now circulating a draft standard on colour identification for emergency services. Twenty copies of the draft have been sent to each of the state/territory representatives on the SAA Technical Committee SF/40. They are to be passed to the Executive Officers of the State Counter Disaster Committees (or equivalent), for wide distribution to the head of each emergency service and other interested agencies.

SAA wishes to obtain comment from as wide as possible within the emergency management community. Closing date for comment is 18th December 1987.

The origins of this project go back many years (in fact to 1977 - the Granville rail disaster); matters have slowly been brought to fruition, following the circulation by NDO in 1985, of a document entitled 'Standardisation of Identification of Counter Disaster Personnel'. The positive response to this document led to the issue of a 'Standard Colour Code for Emergency Services (Provisional)' in July 1986. Earlier the SAA had examined this topic, and agreed it formed the proper basis for development of an Australian Standard. After allowing the provisional code to be in circulation for one year, the first meeting of the Technical Committee was held in Sydney in July 1987. Comments from the Committee are reflected in the draft currently in circulation.

The nominated State/Territory representatives which form the SAA Technical Committee are:

Queensland	Mr. H.S. Christie	SES
N.S.W.	Mr. R.M. Tucker	RESCC
	Supt. D.G. Coates	Police
Victoria	Mr. K. Wilkinson	Police
S.A.	Mr. N.J. Cooke	SES
W.A.	Mr. C.B. Kleinman	SES
Tasmania	Dep. Reg. Chief Officer D.J. Doran	Fire Service
N.T.	Mr. A.J. Beer	SES
A.C.T.	A/Supt. B. Deans	Ambulance
Dept. Aviation	Mr. G. Lawson Smith	Chief ATC/SAR
Dept. Defence	Col. R.E. Hagerty	DOP NDO
S.A.A.	Mr. K.F. Hely	Executive Officer SF40

From a first impression, it would seem to be a relatively simple task to develop a scheme to identify emergency personnel, working at the site of a major disaster. But for obvious reasons, it is not so. The uniforms, clothing and markings currently in use, are well established and entrenched in people's minds. However the recent process of discussion and debate, has helped to focus on the issues of managing a co-ordinated operation of emergency services. Obviously the existence of a standard does not mean that all services have to adhere strictly to its instruction. It is believed the standard will provide a useful and effective objective, to guide us into the future.

In summary, an extract from the Preface to the draft standard is worthy of note: 'The control, co-ordination and direction of all personnel will be greatly facilitated if functional groups or individuals are readily identifiable. Lives in critical danger may be saved if rapid and efficient control of emergency personnel can be exercised.'

INTERNATIONAL

The Society for Traumatic Stress Studies

The Society was established in March 1985 in the United States of America with the agreed purpose:

> 'to advance knowledge about the immediate and long term human consequences of extra ordinarily stressful events and to promote effective methods of preventing or ameliorating the unwanted consequences', and that such an organisation should have three major objectives:

(1) to recognise achievement in knowledge production;
(2) to disseminate this knowledge through face-to-face contact with collegues; and
(3) through other knowledge transfer media, especially print media.

The concept of traumatic stress signifies the area which encompasses the entire process of traumatisation, the initial and long term reactions and recovery including P.T.S.D. Victim populations include rape victims, violent crime victims, police officers and other emergency workers, combat veterans, people involved in natural and man-made disasters, families of victims, and victims and families of intra-familial abuse.

The Founding Meeting was held in Atlanta, U.S.A., in 1985 with Charles Figley author of *'Trauma and its Wake'* presiding.

Annual and mid-year conferences have since been held. Themes for these conferences have included:

> 'Human adaptation to Extreme Stress: From the Holocaust to Vietnam', and 'Toward a General Theory of Traumatic Stress: Treatment and Research Implications'. The theme for the forthcoming conference in October is 'A world view of Traumatic Stress: Similarities and Variations'

Proposed conferences for 1988 and 1989 are one on legal issues, to be co-sponsored by the American Bar Association, and one on grief and loss, to be co-sponsored by the American Association of Pastoral Counsellors and other clergy groups, as well as the Annual Meetings.

The Society will commence publishing a journal in January 1988.

The Society has a variety of task forces including Treatment Innovations, Diagnosis and Assessment, Research Methodology, Theory Development and Catastrophe Intervention. The Society is in the process of forming a group interested in childrens' issues.

The address in the U.S.A. for the Society is:

> Mr. Scott Sheely,
> Executive Director,
> P.O. Box 2106,
> Dayton,
> Ohio, 45401 - 2106, USA.

In Australia the liaison contact person is:

> Ruth Wraith,
> Department of Child and Family Psychiatry,
> Royal Children's Hospital,
> Parkville, Victoria, 3052, Australia.

Effects of Chernobyl Nuclear Accident

Poland was the country worst affected (after the Soviet Union itself) by the accident at the Soviet Union's Chernobyl nuclear power station complex commencing on April 26, 1986. Radioactivity levels rose to well above normal, and there was also concern over the safety of Poland's first nuclear power station, which was currently under construction at Zarnowiec on the Baltic coast.

Police government officials estimated that Poland had lost between $35,000,000 and $50,000,000 in hard currency export revenues, due to restrictions imposed by the European Communities (EC) on food imports from Poland in the weeks following the accident. Although the EC ban had been lifted at the end of May, export figures for July indicated that sales continued to suffer as a result of lingering doubts about the safety of Polish foods.

Source: Keesing's Contemporary Archives, Vol XXXII, 1986, No. 10.

Additional copies of TMD or changes of address; please complete and return the following to the College

NAME.....

ADDRESS.....

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Contributions are welcomed and should be addressed to:
The Editor, "The Macedon Digest", Australian Counter Disaster College, Mt. Macedon 3441, Victoria, Australia. They should reach the College at least 1 month prior to the date of publication which is the first day of each quarter.

ISSN 0817-4024

Editor: Tony Davis Telephone (054) 26 1205