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COMPUTER MANIPULATED CENSUS DATA AND DISASTER MANAGEMENT

By John Salter and Michael Tarrant, of the Australian Counter Disaster College

Introduction

A valuable definition of disaster for hazard managers is that which focusses on their being "the interface between an extreme physical event and a vulnerable human population" (Susman, O'Keefe & Wisner 1983). We too often inherit a legacy of management which overemphasises the characteristics of the physical event. From such analyses, managers can develop various strategies which aim to prevent/mitigate disasters through a range of interventions, such as engineering, land use regulation etc. A too often overlooked area of intervention opportunity is provided by the potential to nalyse the nature and characteristics of the population at risk. An integrated framework, illustrating some connections between hazard and community analysis for developing management strategies is outlined in figure 1.
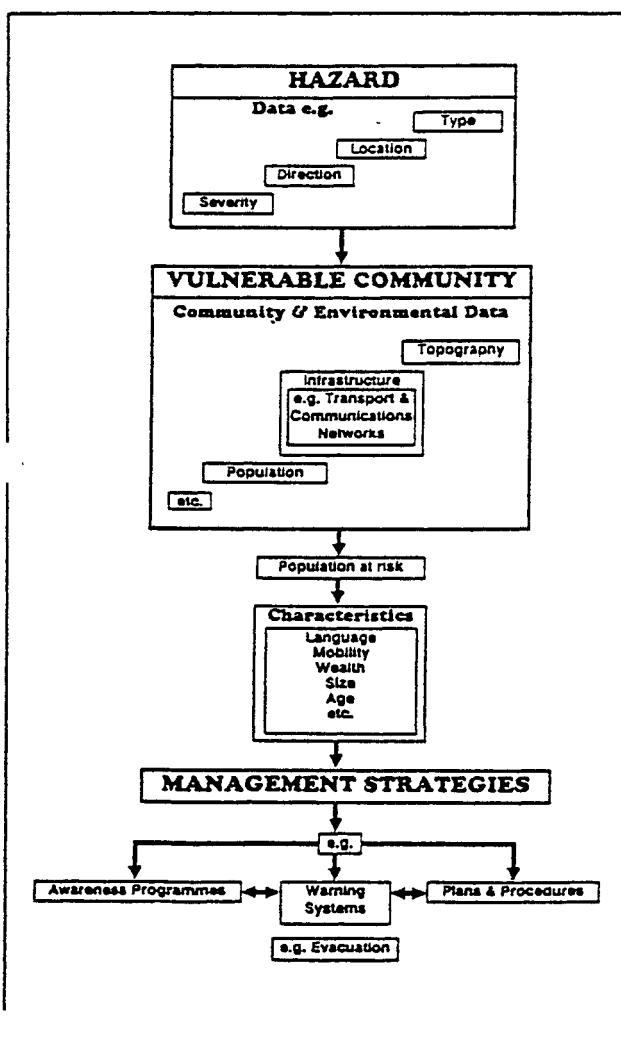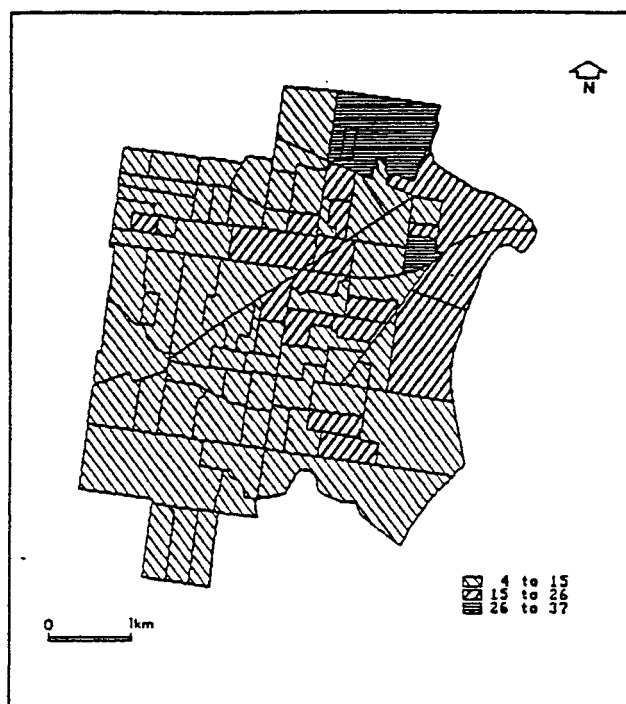

Fig 1: A Community Analysis Framework

Fig. 2: Percentage of population who are not competent speakers of English

Such analyses can be enhanced by the use of census data held on a compact disc accessed by a personal computer using "Supermap" software (produced by Space Time Research Pty. Ltd. and currently available for Australia, Hong Kong, New Zealand and The United States of America.) To illustrate this approach we will discuss its particular applicability at a micro level for a dam break scenario in Canberra; and its general value in providing an appreciation at macro level of a inner urban community within Melbourne.

Macro level: Footscray industrial area of Melbourne

Adjacent port facilities and industrial sites provide an environment with a range of technological hazards associated with processing, storage and the regular transport of hazardous goods. This area has a population in excess of 45,000, and consists of 85 Collector's Districts (C.D.'s).

Planning of disaster managers can be enhanced by appreciations of patterns depicting relevant community characteristics. The census offers over 1,000 items of information, grouped in 43 fields. Many of these fields are of value for consideration, such as that depicted in figure 2 which was generated using "Supermap" software.
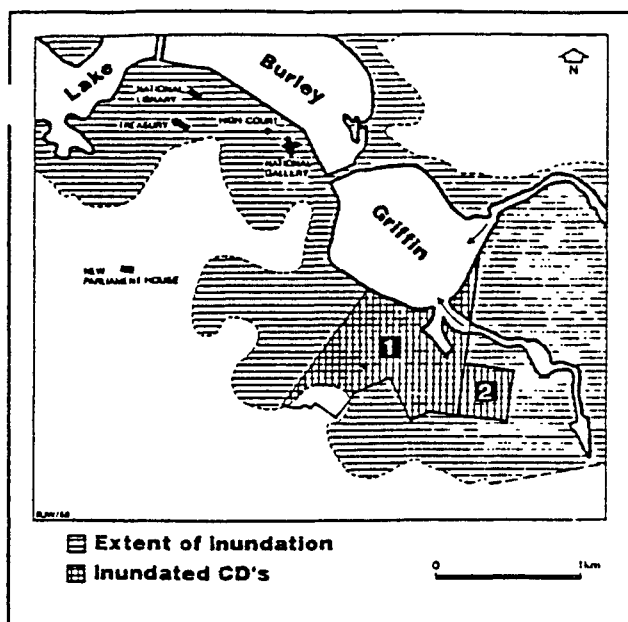
Fig. 3: CD's/Inundation areas for a dam failure above Canberra

Micro level: Canberra dam break

Research by various agencies (e.g. Hydrology and Water Resources Unit of the A.C.T. Water Administration and the Centre for Resource and Environmental Studies of the Australian National University) indicates that a low probability but high impact event may occur if the Googong Dam fails. The predicted areal extent of this event has been mapped. A selected part of the predicted impact area is shown in figure 3. The chosen area contains two C.D.'s which are the basic units for the gathering of census data. These C.D.'s (Nos. 014301 & 014302) are superimposed on the predicted area of inundation in figure 3. Each C.D. reflects differing characteristics which require analysis by disaster managers. Some of the community characteristics appropriate for consideration are listed in table 1.

Collector's Districts (CD's)	1	2
1: Total Population	407	132
2: Same Residence 1985	46	91
3: % Same residence 1981	14	62
4: % Poor English Speaking	1	2
5: % High Density Residential	14	28
6: Children < 11 yrs old as % of population	7	12
7: Single Parents as % of population	1	6
8: % of households with income < $15,000	4	11
9: % of households with income > $32,000	25	0

Table 1: Census Data 1986 Canberra

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Conclusions: General applications

It has become generally accepted that information about the nature of vulnerable communities is essential for effective disaster planning. One limited, but nevertheless significant indicator is census data. This is a particularly valuable source now that it can be accessed and manipulated with speed and ease via "Supermap".

"Supermap" census data is stored on one compact disk. This disk holds all of the information on Australia's population of 16,000,000 for the 1981 and 1986 census. As such it represents a comprehensive data set. From this broad data base the user can manipulate and select data as need or whim dictate. A general picture for a selectively defined and extensive area can provide a macro view, or a selection of only a few Collector's Districts can provide a micro insight. The software is not only easy to use, but is also designed to allow the incorporation of other user defined date via a merge capability. As with most computer technology, the above can all be done quickly, especially compared to the more dated methods involving magnetic tapes and Fortran software. The statistical representation and output of manipulations can be in either table or map form, which further facilitates consideration and analysis. At the "bottom line" of resourcing, cost need not be an undue restriction as the data and software are available for less than SA4000.

It has always been recognised that information is the keystone to disaster management. "Supermap" presents us with new ways to analyse "old" data more efficiently and effectively.

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