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**AN EXAMINATION OF SELECTED ASPECTS OF DISASTER RECOVERY
IN URBAN ENVIRONMENTS: THE CANADIAN RED CROSS SOCIETY AND
THE BARRIE (1985) AND EDMONTON (1987) TORNADOES**

by
NATALIA SKAPSKI, B.A.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of

Master of Arts

Department of Geography

Carleton University

Ottawa, Ontario

29 November 1995

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IN URBAN ENVIRONMENTS: THE CANADIAN RED CROSS SOCIETY AND
THE BARRIE (1985) AND EDMONTON (1987) TORNADOES"**

submitted by **Natalia Skapski, B.A**

in partial fulfillment of the requirements for

the degree of Master of Arts

Thesis Co-Supervisor

Thesis Co-Supervisor

Chair, Department of Geography

CARLETON UNIVERSITY
11 January 1996

Abstract

The geography of hazards has long been concerned with the geophysical aspects of disasters. Over the past fifteen years, this focus has been expanded to incorporate the human element. Risk presents itself in many forms. This makes it imperative to have appropriate emergency responses to a variety of situations. This research analyzes one particular type of risk, that being a tornado, as well as the emergency preparedness response of one organization, The Canadian Red Cross Society, to such a catastrophe. The tornadoes discussed occurred at two different times, 1985 and 1987, in two different cities, Barrie, Ontario and Edmonton, Alberta. The viability of the Red Cross's response to each disaster is analyzed as well as contrasted and compared to the Emergent Resource Coordination Model, as stated by Kreps (1991). In summation, an assessment and recommendations for future operations is presented.

Acknowledgements

Foremost, I extend my thanks to all the people who consented to be interviewed for this research and to the staff and volunteers of The Canadian Red Cross Society who assisted in my “great data search”, especially as many of them had more pressing matters to attend to. My mom, I thank, for keeping her fingers crossed, worrying and her love and overwhelming support; my dad, I thank, for letting me make my own mistakes not counting my grey hairs. John, I commend, for putting up with my anxiety and I thank him for his love and support and for scanning my photographs. I thank Venus for making sure all my commas are in the right place and for catching my dangling participles. Scott and Ross are thanked for sparking my interest in emergency services. I would also like to thank my supervisors for keeping me in line and Jo, Rich, Steve and Lorra just for being there. Finally, I thank the Graduate Students’ Association for understanding my need to “multi-task” and for letting me use their resources for the final production of this thesis.

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Chapter One

Introduction

1.0 Introduction

This research assesses the emergency social service response activities of two Branches of The Canadian Red Cross Society (hereafter: Red Cross), in their individual roles in the Barrie, Ontario and Edmonton, Alberta tornadoes, which occurred in 1985 and 1987, respectively. These activities are assessed against an adaptation of the Emergent Resource Coordination Model developed by Kreps (1991), in turn, built upon the works of Quarantelli (1987) and Dynes, Quarantelli, and Kreps (1972). The case studies will be assessed individually against the model, as well as compared and contrasted with one another. Personal interviews with emergency social services responders provide much of the data for these analyses and these are balanced with primary and secondary documentation accounts.

Traditionally, hazards studies in geography have focused on geophysical events and not really taken into account the human element and repercussions of the events upon the affected populace. Recent studies, however, have begun to explore the ramifications of geophysical hazards and disasters for affected populations. Therefore, the objectives of this research are twofold: to assess, compare and contrast the emergency preparedness of two distinct Red Cross branch offices and to assess their effectiveness in reestablishing a sense of community after a disaster:

The geography of risk involves the description and evaluation of two sets of phenomena. First, there are those of the actual incidence and distribution of damage to human societies. Here, studies have tended to focus upon sudden, short-lived or more extreme bouts of damage, and damaging events affecting communities, regions and states. Other fields usually deal with "chronic" or long-term risks of, for example, disease, crime, or environmental deterioration.... The problems are not separate in practice nor causation, as is made clear by the second set of phenomena.

These concern the contexts and broader explanation of how risks arise. They include continuing conditions of everyday life and developments that tend to decide whether, to whom and with what intensity, damages may occur. They are important both for the interpretation of risk and identifying strategies that will mitigate or prevent damage.... Risk always depends upon the environmental and social context, however, and what is normally discussed in terms of material life, culture, and political organization.

It is in this sense especially that we may speak of a human ecology of risk, and identify it with the general concerns of human geography (Burton et al 1968). Hazards studies have developed, however, largely as an "applied" or problem-oriented geography. They ask questions of general geography largely from the baleful perspective of human tragedy and failed projects; how the continuing patterns of human ecology and geography relate to their role in moments of collective stress and devastation. (Hewitt 1992: 47-48)

The progress of hazards studies in geography will be further discussed in Chapter Two.

For the most part, the terms "emergency", "hazard", "risk", and "disaster" are interchangeable. Definitional and technical interpretations do exist, although definitions tend to be context specific. For the purpose of this research, the definition of "disaster" as outlined by Emergency Preparedness Canada will be used:

It is an interruption in the time and space of normal processes causing death, injury or homelessness, direct material losses and/or negative economic impact. The interruption is beyond the coping capacity of the community. The interruption can be [of] either sudden or gradual onset. The interruption precludes war (January 1993: Forward).

By this definition, a disaster is an event which falls outside the day to day workings of a community. The community can be an organized society or a portion of the larger society. An industrial facility or those affected by an airplane crash, are examples - that cannot be mitigated effectively by the "normal", day to day, safety measures already in place in any given community. Hence, assistance is required beyond the established response mechanisms available to a community.

The generality of this definition is important to note: there is no specific

description given for what the disastrous event or "interruption" may be—just the major consequences resulting from it, including the inability to effectively mitigate it. This is due to disastrous events being situation and context specific. If a community can capably handle an unusual event without breaking the established, day-to-day, routines, then by this definition, the event is not a disaster. For example, a community situated on the flood plains of a river may be quite adept at dealing with the consequences of a river flooding, regarding them as "normal", seasonal events. That same community, however, may not have the safety mechanisms in place to deal with a severe winter storm and may require assistance from outside the community, as well as from volunteers within the community to cope with the extreme conditions. Who defines a situation as "abnormal" (for example, a mayor may declare an emergency) bases the interpretation on cultural and political processes.

The disruption a community undergoes during and immediately after a disaster varies from one event to another. In all cases where human lives are affected, this disruption is mitigated by a range of emergency social services that may be available to the community, on either a formal or informal basis. In Canada, the responsibility for emergency response lies with the provincial and territorial governments, manifested in the provincial and territorial emergency measures organizations. The provinces and territories then further delegate emergency preparedness and management responsibilities to the local governments. Government initiatives are further supplemented by nongovernment organizations, (NGOs), that take responsibility for certain tasks in the aftermath. The Salvation Army, for example, may be asked to provide food and clothing for those persons who are displaced by the emergency; The Canadian Red Cross Society may be made responsible for providing registration of all displaced persons, while the Mennonite Disaster Services may be requested to aid in the clean-up and repair of affected homes. Other community organizations and church

groups may provide ad hoc volunteer groups willing to take on almost any task. Working together, these organizations provide an emergency social services network that, if not always in a state of immediate readiness, is prepared to facilitate the community reorganization that is required after a disaster.

Although many organizations are involved in the disaster recovery process, in this research specific attention is paid to The Canadian Red Cross Society. There is no set national standard which outlines emergency preparedness for individual branches of the Canadian Red Cross. The situation is unique in each community, as it relies upon the resources and volunteers that are available in the event of an emergency. This is an important difference from the American Red Cross, which has a nationwide network for disaster response, which was first mandated by the American Congress on 5 January 1905 and reaffirmed in 1936 (American Red Cross 3001 1982: 1).

The role of The Canadian Red Cross Society is often confused with that of the American Red Cross. This creates a general misunderstanding of what the Canadian organization does in the event of an emergency. In some instances, the inundation of the Canadian public by the American media has created a false expectation of Canadian Red Cross activities. On occasion, this has resulted in individual branches of The Canadian Red Cross Society providing increasingly diverse aid than that for which these branches were individually responsible.

1.1 Case Studies

The case studies of the South Simcoe Area Branch (hereafter: Barrie Branch) and the Edmonton Branch of The Canadian Red Cross Society are significant to this analysis for several reasons: firstly, both Branch responses were reasonably successful, secondly, both Branches took on duties well beyond those initially expected of them; thirdly, the levels of preparedness of the two Branches were diametrically opposed. The Barrie Branch was experienced in handling disaster response in the community; prior to the

tornado the Edmonton Branch had handled nothing greater than house fires.

The primary focus is on how - and which - Red Cross activities serve to aid the community in its reorganization, immediately following the disasters. This research will also analyze whether or not the lessons learned from the Barrie tornado disaster were applied in the response phase of the Edmonton tornado disaster. If this was the case, how they were implemented will also be discussed.

1.2 The Canadian Red Cross Society Organizational Structure

The Canadian Red Cross Society is organized into four levels of governance, which are hierarchical in nature. The Branch offices situated in the communities implement programmes which are developed at the higher levels. The Area or Region offices oversee the functions of several Branch offices, while the Division offices manage the activities in a province - or group of provinces (such as the Maritimes) - or a province and a territory (as in the case of British Columbia and Alberta). The National

Office, located in Ottawa, is the policy making body for The Canadian Red Cross Society.

This structure contains two decision making streams: the staff and the volunteers. At the Branch level, staff positions are limited and most of the activities of the Red Cross are conducted by volunteers. The ratio of staff to volunteers varies from Branch to Branch. At each ascending level of governance, the proportion of volunteers decreases and that of staff, as well as staff responsibilities, increases. Hence, local initiatives depend, for the most part, on volunteers.

1.2.1 *Emergency Services*

In June 1989, The Canadian Red Cross Society National Office instituted a standard for Emergency Services in Canada (The Canadian Red Cross Society 1989). Until this point individual Branches were relatively autonomous in their emergency services roles, needs and programmes, beyond the knowledge that they might be called upon to perform certain tasks at a local level. Therefore, if there was an interest in emergency services in a particular community or Branch, more emphasis would be placed upon developing a local programme to service local needs (for example, a response to house fires).

Although disaster response is a service of The Canadian Red Cross Society, the Red Cross is not the primary response agency for emergencies in Canada:

By Act of the Canadian Parliament of 1909 and its issuance to the Society of continuing letters patent in 1970, The Canadian Red Cross Society has been mandated to provide protection and assistance to victims of armed conflicts and disasters in time of war or peace anywhere in Canada or elsewhere around the world. The Society is officially recognized by the Canadian Government as a voluntary relief Society, auxiliary to the public authorities, and particularly to the medical services of the Armed Forces, in accordance with the provisions of the first Geneva Convention of 1949. (The Canadian Red Cross Society 21 March 1988: 3-4).

The Red Cross comes under the "umbrella" of government social services in time of disaster, and is primarily responsible for Registration and Inquiry (R&I), although it may take on other emergency social service responsibilities when asked, such as providing food, clothing, shelter and personal services.

Registration and Inquiry is a service offered to persons displaced by a disaster situation, allowing them to register with the Red Cross, while concurrently, family and friends inquiring after those who may be in the disaster area also register. These registrations take the form of an "inquiry" with the Red Cross. The two lists are then cross-referenced and family and friends are reunited. R&I is a standardized procedure in Canada, using forms which are provided by Health Canada (see Appendix "A").

In a disaster situation, the Red Cross can be classified as an "expanding organization" (Stallings 1978: 89-90, after Dynes 1970), in that its volunteer base expands rapidly. As an established volunteer aid organization, it attracts walk-in volunteers who are not formally registered with the Red Cross but who - because of the immediate and perceived need - want to help. For example, the Edmonton Red Cross attracted over 1000 community members within hours of the tornado:

Within an hour of the tornado hitting, we had volunteers arriving on our doorstep to go to work who had never been involved with Red Cross before. People would just walk out of their offices and come over to Red Cross and say "Put me to work". By midnight, we had, I don't know what the number is, I'll say 1400, 1400 volunteers. I had an army at my beck and call. (Tyre 1994: Interview)

This influx of "irregular volunteers", both fortifies and hinders the existing structure of the organization. New volunteers are employed to fill roles where the Red Cross staff and volunteers may be short handed, which enable the organization to expand its services to fill immediate needs. At the same time, a regular volunteer or staff member must take the time to be responsible for this new pool of people, as well as to register and direct them, which may lead to initial confusion in response operations.

1.3 Thesis Organization

Chapter Two provides background information and outlines several concepts in disaster studies and hazards research that are relevant to this research. Chapter Three explains the research methodology and analysis framework. Chapter Four describes the Red Cross responses to the two tornado disasters. The fifth chapter provides an assessment of Red Cross emergency services activities in relation to an adapted version of the Emergent Resource Coordination Model, leading to a comparative assessment. The concluding comments, summation and recommendations are provided in Chapter Six.

Chapter Two

Concepts and Contexts

2.0 Introduction

The disaster response and recovery process is part of the greater mechanism of disaster preparedness planning and management. For the most part, this is a planning role that prepares for the contingencies of large scale or uncommon emergencies that may affect a population in a manner beyond the scope of routine emergency response mechanisms, ranging in scale from a local level to an international response¹.

The disaster management community stretches into all areas of society. The most local personalized level is the home where the individual citizen becomes an informal member of this community by planning fire escape procedures for the family. In the public and private sectors, utility companies, such as electricity generating and distributing enterprises, plan contingencies for power failures. Many urban centres have emergency plans and response networks that often incorporate local NGOs, with response teams ready to cordon off an area of the city, evacuate the local population, and provide primary services, for any type of large scale or non-routine emergency, ranging from a multiple house fire to chemical spills or explosions or terrorist attacks. At the national and international levels, government and NGO relief agencies respond to major events of wars such as famines or typhoons, by sending aid, in all forms of materiel, evacuating civilians, or by providing local education initiatives. Disaster management may also take many technical forms ranging from the development of policy and the creation of zoning by-laws to the engineering of dams and bridges. With the advent of nuclear power as well as the resultant nuclear waste from these facilities, an entire area of research has opened up to deal with the issues which have arisen, such

¹ Although disaster research usually concerns human populations, much research has been conducted into veterinary concerns of animals affected by disaster. For more information please see: Dorn 1993, Heath 1993; Marshall 1993a and 1993b; and Moore 1993

as risks involved with the geological disposal of nuclear waste and the risks involved with nuclear power plants. Obviously, these issues would require specific emergency preparedness plans².

This chapter first outlines the basic themes in the study of disaster, with particular emphasis on the discipline of geography. The temporal components of disaster and the principles of disaster planning are then described. The chapter concludes with two examples of practical studies of the emergency response operations of a volunteer organization: the American Red Cross. Setting aside the organizational differences of the American and Canadian Red Cross societies, the examples at the end of this chapter are two of a limited number available pertaining to modern North American disaster situations.

2.1 The Scope of Disaster Studies

According to Joseph Scanlon, study of disaster began with the work of Samuel Prince on the 1917 Halifax explosion:

The Halifax explosion is important to disaster research because of one person who was in Halifax at that time. He was an Anglican priest. His name was Samuel Henry Prince and he was to study the response to the explosion for his PhD at Columbia University in New York: with his thesis he became the world's first student of disaster. (Scanlon 1988)

Since that time, disaster studies have developed primarily from two traditions in sociology and geography, a) disaster research and b) natural hazards research, respectively (Burton 1983: v). The sociologists have examined the social aspects of disaster while the geographers have concentrated their efforts on the study of geophysical processes. This, for the most part, is the dominant division, although in recent years geographers have begun to incorporate a greater awareness of social and political aspects into their research, blurring the divisions (see Ken Hewitt on victims of

² For further reference, please see Yeager 1994, White, R 1995, and Grobbelaar 1995.

the disasters of war: 1983a, 1987, 1990, 1992, 1993; and, Sarah Michaels on developing policy and issue networks for earthquake preparedness: 1992a, 1992b, 1993a, 1993b).

Other disciplines have contributed to the field, notably anthropology and psychology. There is no lack of topics of study produced by disaster:

Disasters may be viewed and analyzed on several levels. On the one hand, they are events that vary with the medium in which they occur. Geophysical events, climatic or metrological events, technological events, or biological events all may be distinguished one from another.... On the other hand, disasters may also be political or economic events, influencing hierarchical organization and upsetting economic balances. As social events, they may cause social disruption, disorganization, and massive migration. As psychological events, they may produce trauma, fear, stress and shock. The nature of disaster includes all of these levels of analysis, each interacting with the others to produce an event and its impact (Baum 1987: 11).

From this description, it is important to note that a certain amount of categorization is possible in dividing up a disaster for study, yet none of the individual areas is exclusive; even when studied independently, they overlap with other interest areas. This is significant in studies dealing with subjects that are obviously in the area of social science but not obviously limited to any one of the social sciences. For example: the study of massive migration has aspects of social, political, economic, psychological and geographical interest, yet the prominent line of inquiry will ultimately distinguish the subject area.

2.1.1 The Progress of Hazard Studies in Geography

According to Alexander (1993), the geographical study of hazard began with the work of Harland Barrows in his studies of "human ecological adaptation to environment" in the 1920s, and gained prominence in 1945 with Gilbert White's work on flood hazards (p. 13) although White's work really gained momentum over a decade later. The pioneers of hazards research were Gilbert White, Ian Burton and Robert Kates, who were followed later by Kenneth Hewitt. Much of the focus of their earlier

work was the assessment of flood plain hazard for the purpose of strengthening regulatory measures and cost reduction due to flood losses.

In 1958, the research paper (White, et al, 1958): *Changes in Urban Occupance of Flood Plains in the United States*, produced "an exploratory study of changes in the urban occupance of the flood plains in the United States since the enactment of the Flood Control Act of 1936" (p. 1), in an attempt to provide a broader understanding of American flood problems through classification and the charting of land occupance (p. 19). Further work on riverine and coastal flood plain management, perception and hazard, was carried out over the next decade (see White 1961; Kates 1962; Burton 1969), later expanding research to include a variety of hazards at a single place (see Hewitt and Burton 1971).

The focus of this early work was on the geophysical process of hazard, and the goals of research were threefold: 1. the monitoring and prediction of hazards, 2. the containment of hazards or - if this was not possible - the diversion of human activities from the hazardous area, and 3. the use of research results to enhance planning activities and to establish emergency measures organizations for relief or rehabilitation operations (Hewitt 1983b: 6).

In the early 1980s, there was a shift in focus in hazards research from geophysical to social issues, concentrating on the social values, order and processes as the keys to determining the form a disaster will take³ (Hewitt 1983b: 24-25). In the compilation, *Interpretations of Calamity*, edited by Hewitt (1983b), geographers such as Hall, Waddell, O'Keefe and Hewitt began to critically examine the existing framework of hazards inquiry shifting the focus to the effects of disasters on the lives of those affected, thus broadening the area of inquiry available to the geographer from the study

³ Please note that the disaster and the disaster agent are two different things. "We use the term 'disaster agent' to refer to natural phenomena such as earthquakes, hurricanes, ... and floods. 'Disaster' refers to the social disruption that often follows the impact of a disaster agent" (McLuckie 1975, quoted in Britton 1987: 38)

of natural hazard to that of the disaster. Although geographers still tend to lean toward the geophysical line of inquiry⁴, there is a small portion of the literature that covers socio-geographical and policy oriented studies.

This shift in focus is apparent in the work of Ken Hewitt and Sarah Michaels. Since the early 1980s, Hewitt has published several studies focusing on the social and economic aspects of disaster. His studies focus on two areas of study: hazard risks, most notably seismic activity, in mountainous regions (1982, 1984, 1992), and the affects of the disasters of war on civilian populations, specifically the arial bombings of World War II.

In his 1992 study "Mountain Hazards", Hewitt examines "mountain land risks, especially those that involve sudden, more or less localized bouts of damage and disasters" (p. 1). His study examines these risks in terms of: a) hazardous conditions that "initiate and are often the main, immediate causes of damage" (p. 2), b) human vulnerability to hazards and disasters because of "discriminate patterns of harm as a function of social geography, land uses, and built environments" (p. 2), and c) intervening factors such as terrain, settlement patterns, and the "particular state or activities of people at the time... [of the disaster, which may promote] problems of communication and access in mountain disasters" (p. 2). Based on this criterion, Hewitt first provides a survey of mountain area disasters (p.p. 49-50). From here he progresses to examine specific case examples of the social and economic affects of disaster arising from earthquakes, war, the forced migration associated with hazards, as well as the (North American) disasters of drug trafficking, derived from the mountain-grown crops of cocaine and heroin, which manifest in addiction (p.p. 55-6). Hewitt concludes with four observations relating to risk and hazard studies:

⁴ This is most noted in classroom text books where a human-environment interaction is still prevalent in the study of hazards; and, often linked to the topic of environmental resources (see Jones 1991, and Mitchell 1979).

1. Risk and damage are treated as essentially a function of "the hazard".... Most discussions of the geography of risk, rather than using the distribution of damages as the "actuarial space" of risk, treat the objective distribution of geophysical and other hazard agents as the defining map of risk. (p. 57)
2. Human vulnerability is seen to depend upon "objective" official-type measures, notably of population, per capita and other general measures of "wealth", technology or "stage" of economic development. These too, favour essentially deterministic frameworks of the neo-malthusian, social darwinism or economic historicism schools of thought. They are social constructs of crisis and well being that hold sway in the classrooms, media and political rhetoric of urban-industrial societies, and that underwrite the dominant views of material life in modern research. (p. 57)
3. Risk and disaster tend to be defined and the questions posed in, as it were, a strictly "vertical" sense: as a relation between a damaging agent and those it may harm. The condition of a group of people is defined in terms of an equation between their numbers or attributes and their immediate resources and habitat. (p. 57)
4. Mountain studies are preoccupied with the high alpine zone and most rugged areas, the most spectacular views or processes. These, or the "elemental alpine events", are often treated as somehow most definitive of high mountain environments. (p.p. 57-8)

In his work on the disasters of war, Hewitt has focused mainly on how arial bombings in World War II affected: a) civilian populations and b) the subsequent destruction of urban places (see 1983a). Hewitt's World War II study "'When the great planes came and made ashes of our city...': Towards an Oral Geography of the Disasters of War" (1994) traces "the extreme experience of "ordinary" citizens in their home places, and a human ecology of disaster that emerges when its victims speak for themselves" (p. 1). In this study, Hewitt used excerpts from the United States Strategic Bombing Survey, in which European civilians were interviewed by the American military after World War II, to produce a first-hand, albeit historical, account of the affects of war-disasters on the lives of those not 'officially' involved in the conflicts. It provided information on social

structures and community interactions that were over-shadowed by the war, yet operated concurrently.

The work of Sarah Michaels approaches the study of disaster in terms of emergency preparedness and planning on the part of policy making organizations. One of Michaels' studies, "Discovering and Analyzing Earthquake Issue Networks in British Columbia and Washington State" (1993b), explores the degree to which the flow of emergency management policy information is based in culture or hazard:

Geographers have a long and distinguished record in contributing to natural hazards research, a field in which the interplay between physical phenomena and human actions are integrally related. One aspect of this interplay is how natural hazards combine with human-generated factors, such as political culture, to shape groups that address public safety. Comparing the dynamics of the groups concerned about earthquakes in two jurisdictions - British Columbia and Washington State - allows us to explore to what extent information exchange is a function of hazards and to what extent this exchange is a function of a particular cultural/political context.(p 156)

Michaels views the development of emergency measures policy as being based on the knowledge of the policy makers and the composition of the policy making body. She argues that "the exchange of information is integral to the development and maintenance of links among people who have divergent expertise and interests" (p. 156). This information exchange is largely based on "issue networks" and "information webs". Michaels describes issue networks and information webs to be:

The conceptual framework of issue networks provides insight into how and why people's interests coalesce around topics, such as earthquakes, which are not necessarily salient to the wider society. An issue network is made up of individuals taking action on a particular aspect of an issue.... Information webs are the mechanisms through which information is conveyed within an issue network, between issue networks, within a policy community, and beyond a policy community. (p.p. 157-8)

In this study, Michaels goes on to compare the earthquake policy communities of British

Columbia and Washington State on the basis of the similarities between the two communities (the actual seismic threat, the information dissemination of issue networks, and the occupational composition of the policy making bodies) (p.p. 158-60), and the difference (damages from seismic events, the political culture of the two countries, government intervention in policy making, the availability of resources, and coalition building among interested parties) (p.p. 150-63). Michaels concludes by stating that although the policy making process is similar in the two countries, there is not necessarily a parallel in how the policy making body is composed.

While information exchange does lead to comparable dynamics in both earthquake policy communities, the differences in political systems necessitates that the earthquake policy communities employ different tactics to bring their concern to the attention of influential politicians. In sum, the similarities that shape parallel policies do not automatically produce similarities in the earthquake policy communities that shape those policies. (p. 164)

The studies of Hewitt and Michaels do not concentrate on the disaster agent as much as they do on the people and processes that it affects: the research is concerned with the human response. The response may be the personal feelings described by a mother in war torn Europe, or it may be the dissemination of information by emergency planners in preparation for an earthquake.

This thesis specifically examines the organizational response to disasters and proceeds, by doing so, to fill some of the gaps which exist in geographical-based studies of disaster. The study of disaster response is an extension of the White-Burton-Kates approach to hazards and land-use decision studies. These pioneering studies focused on the behaviour and perception of the residents inhabiting flood prone areas. Here, the focus of study was on why people chose to live in areas where they may be adversely affected by geophysical processes. The research did not approach the

questions of how these residents were affected once the calamities occurred.

In the early 1980s, Hewitt, et al, extended the "White School" research to incorporate socioeconomic aspects of how disaster affects a community. In loose terms, the combinations of the two aspects of the study of disaster have provided analyses on the pre-disaster state of a community, in measuring perceptions and charting behaviours, as well as the post-disaster state of a community, focusing on the (possibly long-term) effects of disaster on the given population. Hence, this shift in focus presented several gaps in the geographical study of disaster, namely the disaster state of a community: What happens to a community during a disaster? How does a disaster disrupt a community? How does a community respond during, and to, a disaster? And, how does a community prepare to respond to a disaster?

In studying how two organizations actually responded to real disasters, I am further attempting to fill this gap in knowledge of how disasters affect human populations. The remainder of this chapter provides general background information for practical emergency preparedness and planning and then contextualizes these concepts in two studies by David Neal.

2.2 Concepts for Emergency Preparedness and Planning

Prior to discussing NGO emergency response activities, it is necessary to understand the temporal phases of disaster, as well as the response planning mechanisms. Different phases of a disaster require different responses. A specific agency is not always involved in every aspect of a disaster response. Emergency planning and response is essentially a cooperative process. Therefore, when examining any particular aspect of the issue, it is useful to understand the process as a whole

2.2.1 *Temporal Phases of Disaster*

For the purpose of this research, disaster can be divided into different phases or components. These phases range temporally from the time before the disaster occurs

through to long term post-disaster activities, such as reconstruction.

The pre-disaster phase is the time period which precedes the impact of the disaster agent. This may be a very short period of time, measured in minutes, which could extend to several hours - or days - prior to the event. This is the time at which the first indication of disaster may be evident; warning of the event may be given if there is adequate time and foreknowledge. This phase should not be confused with the "pre disaster state" of a community which can be considered the "normal" day-to-day functioning of a community that has no conscious knowledge of risk, or which chooses to ignore the risk (i.e. communities situated in areas of frequent seismic activity that may be in danger of an earthquake at any time).

This initial phase is followed by that of the impact of the disaster agent - the calamitous event - that creates the disaster, the social disruption. Kates and Pijawka (1977: 1-4) in their model, "A Sequential Model of Disaster Recovery Activity", detail the phases which follow impact as having four divisions with associated temporal dimensions:

1. emergency responses,
2. restoration of the restorable,
3. reconstruction of the destroyed [structures] for functional replacement and
4. reconstruction for commemoration, betterment and development. The time required for each activity period (except for the last) is about ten times that of the previous one.... one can distinguish between a period of emergency response - when survival and related needs are at the highest - and other periods that follow.... 'restoration', 'recovery', 'rehabilitation', 'redevelopment' and 'reconstruction'.... such period divisions are arbitrary, and are only useful in distinguishing the major functional activities of a period (p. 1).

Following impact, the disaster response and recovery phases begin. The response phase (the "emergency period" as listed above) starts as soon as an individual or a collective (formal or informal) responds to assist those in the community who need help. This activity could range from search and rescue (looking for the lost, injured or dead), to

sandbagging and clearing debris, as well as providing immediate medical care, food, shelter and clothing for those in need. This is the period in which the community needs are assessed and - if possible - the appropriate aid is provided.

During this period, normal social and economic activities cease or are drastically changed. The emergency period may be very short in societies with a great capacity to cope with disaster, lasting only days or a few weeks, or it may drag on for much longer periods of time in societies with a limited coping capacity (Kates and Pijawka 1977: 2).

This phase "ends" when immediate, external, aid is no longer a priority, when people can cope for themselves and some semblance of "normality" is re-established: when there is no longer "need".

The recovery phase builds upon the response phase. This is where the more substantial - but not immediate - needs of the community are met. At this point, temporary housing is arranged, financial claims are made, reconstruction commences, and the community starts to rehabilitate itself to the point of self-sufficiency. Kates and Pijawka divide this phase into three components:

The restoration period: the patching up of the utility, housing, commercial and industrial structures capable of being restored, and the return to relative normal functioning of social and economic activities.... Some sample indicators that might be used to distinguish the end of the restoration period are the functioning of the major urban services, utilities, and transport, the return of those refugees intending to return, and substantial clearance of rubble.

The replacement reconstruction period: the capital stock is rebuilt to predisaster levels, and social and economic activities return to predisaster levels or greater. The indicators of the end of the period are the replacement of the population and of the functioning equivalent of their needs in homes, jobs, capital stock and urban activities.

The commemorative, betterment and developmental reconstruction projects: to memorialize or commemorate the disaster, to mark the city's post-disaster betterment or improvement; or to serve its future growth or development.... such projects are large, and usually financed by the government. The activity may extend over twice the period required for replacement reconstruction (p. 3).

Kates and Pijawka used this breakdown in assessing the temporal recovery processes of four case studies: the San Francisco earthquake of 1906, the Anchorage, Alaska earthquake of 1964, the Rapid City, South Dakota floods of 1972, and the Managua, Nicaragua earthquake of 1972 (p.p. 4-23). They noted that the rate of recovery is "directly related to the magnitude of the damage. The resources available for recovery, the prevailing predisaster trends and such qualities as the leadership, planning and organization for reconstruction may also be important" (p. 12).

My research is concerned with the immediate operational activities in the response phase or the "emergency period". Most designated emergency response organizations have plans or guidelines for responding to disasters. These plans may or may not be comprehensive, depending on the level of the organization and the available resources. The planning process is outlined in the following section.

2.2.2 Disaster Preparedness Planning and Management

Kreps states that the aim of emergency response "is the rapid restoration of normal routines. Efforts must be made to anticipate possible impacts of a range of different hazards and to develop counter measures to neutralize or soften these impacts" (1991: 33-4). The necessity to plan for the contingencies of disaster is important, for the planning process will ultimately guide the response operations. This is not to say that every emergency response organization has an emergency plan. The planning process may be hindered due to the size of the organization, the resources available, and - sadly - the interest level of the staff or policy making body. The level of plan comprehensiveness may vary from one organization to the next. One agency will have a detailed response plan with personnel assigned to specific jobs, while another organization may only have a skeletal response plan which outlines where the jobs will be taken on as well as distributed, in an ad hoc manner, when the need arises.

There are recognized criteria by which planning should take form. Dynes, Quarantelli and Kreps (1972), Quarantelli (1987), and Kreps (1991), have written extensively on this subject. The manual, in which Kreps discusses this issue, Emergency Management: Principles and Practice for Local Government (editors Thomas Drabek and Gerard Hoetmer), is considered the current standard for emergency planning; although American in focus, it is used extensively in Canada. In brief, the principles of emergency planning can be summarized in the following ten points:

1) *Disasters are qualitatively different from minor emergencies:* The training, preparedness and planning required for a response to a disaster is not the same as that required for a minor, routine emergency of the kind that is serviced daily by police, fire or ambulance. Quarantelli (1987) notes that many emergency providers see their roles in a disaster as simple extensions of their everyday roles as emergency responders; he states this belief is a fallacy, for disasters are fundamentally different from minor emergencies (p. 1). Quarantelli delineates the differences by employing four examples which distinguish everyday emergencies from disasters:

(A.) Inter-organization relationships change in disaster situations:

During disasters, organizations are forced into more and different kinds of interactions with other groups. The greater the number of contacts among organizations the more new relationships with other groups or organizations will be established.... Conversely, during periods or normalcy new relationships between organizations often develop very slowly. There is seldom a need to suddenly and concurrently establish linkages with multiple groups having local, state, and regional, and/or national components....(p 2).

(B.) Organizational autonomy and personal freedoms may be curtailed during a disaster:

During disasters, organizations will lose some of their autonomy (e.g., direct control over their own functioning).... As a direct result of the loss

of organizational autonomy, daily activities which are taken for granted become problematic during a disaster. The freedom of mobility within the community, as for example, entering or leaving one's property, may be restricted by police barricades or an evacuation order (p.p. 2-3).

(C.) The operating procedures of an organization change during a disaster:

Performance standards for organizations may change drastically during disasters. What is appropriate during periods of normalcy or minor emergencies often becomes less relevant during the managing of a major community crisis.... Thus, performance criteria used during daily routine operations yield to the adoption of disaster performance criteria during major crisis occasions (p. 3).

(D.) The boundaries between the public and private sectors blur:

A minor emergency is often managed by an organization (public or private) having responsibility or authority to effectuate an emergency response to deal with the situation, or is managed by local organizations such as the police and/or fire department. Under emergency conditions, the crossing of boundaries among public and private sector organizations is seldom required. However, during disasters, a more coordinated relationship among public and private sector organizations is required (p.p. 3-4).

Quarantelli concludes by stating that it is important to take into account the difference between disasters and minor emergencies in the planning process because the activities around these two situations are as fundamentally different as are the situations (p. 4).

2) *Planning is a continuous process:* Preparing for a disaster does not end with the production of an emergency plan. An emergency plan must be regularly updated to reflect the changing needs of the community and the materiel and resources available. An out-of-date emergency plan may hinder response operations more than having no plan at all (Dynes, Quarantelli, and Kreps 1972: 1-2; Kreps 1991: 34).

3) *Attempt to reduce the "unknowns" in an emergency situation:* The planning process is geared at anticipating problems and providing a range of solutions. With proper

planning, some problems can be avoided from the start. "It is often impossible to keep a given disaster from happening, but once it does happen, it is possible to soften its impacts on the physical and social environment" (Kreps 1991: 34). These researchers suggest that it is important to remember that not all contingencies can be planned for, and there will always be a degree of uncertainty in any plan (Dynes, et al 1972: 2; Quarantelli 1987: 9; Kreps 1991: 34).

4) *Planning to evoke appropriate actions:* An appropriate response is more effective than a quick response: "Speed is undeniably important in some respects, but appropriateness of response is a far more important overall goal" (Kreps 1991: 35). Through education and training of the response personnel (Kreps 1991: 36), planning "should help to discourage impulsive reactions and to encourage the adoption of appropriate actions necessary to meet the challenges of the immediate situation" (Quarantelli 1987: 10).

5) *Base planning on what is likely to happen:* Planning must be flexible: it must incorporate a realistic human factor into the preparedness process. Plans should be produced more on "the basis of what people usually do in normal situations and what they will probably do in emergencies, than to expect them to change their behaviour drastically in disasters" (Dynes, et al 1972: 2). Likewise, this tenet should be applied to organizations; neither organizations nor people will fundamentally alter their behaviours to fit any preconceptions built into an emergency plan (Quarantelli 1987: 10).

6) *Planning should be based on knowledge:* Planning needs to be based on knowledge, not myths and misconceptions surrounding human behaviour. "It is frequently but incorrectly assumed that the immediate problems of disaster involve uncontrolled

behaviour, looting, panic, and the like" (Dynes, et al 1972: 3). Quarantelli states that:

Studies have consistently shown that this is simply not the case. People as a whole do not panic.... Disaster victims are usually quite frightened, but that does not mean they will act selfishly or impulsively. They do not become unreasoning animals, but instead (one could argue) they tend to show more rationality under stress than they do normally, if by rationality is meant conscious weighing of alternative courses of action in a situation (1987: 11).

Conversely, there are examples to the contrary, where panicking and looting and the like have occurred during disasters such as the situation which occurred in Florida in the aftermath of Hurricane Andrew and the American public's reaction to Orson Welles' radio broadcast of H.G. Wells' War of the Worlds in the late 1930s. Perhaps, much of the debate of this point is based upon the conception of: "panic", which has been colloquialized. That, however, remains a topic best studied elsewhere. Suffice it to say that the discussion and debate about human behavioural responses in the advent of a disaster has not reached a definable conclusion.

7) *Planning should focus on general principles, not on details:* As every disaster situation is different, planning must provide a general course of action that may be applicable to most situations. Quarantelli states several reasons for this:

It is impossible to plan for everything. Situations are constantly changing and specifics quickly get outdated. Too many details leave the impression that everything is of equal importance when that is clearly not the case.... Complex and detailed planning is generally forbidding to most potential users and will end up being ignored. While disaster planning cannot totally ignore specifics, particularly at the organizational level, good preparedness planning should be based upon the use of general principles from which simple rather than complex points can be developed (1987: 8).

8) *Planning is a process:* Preparing an emergency plan is just one aspect of disaster preparedness planning and management. The planning process includes:

- a. Convening meetings for the purpose of sharing information;
- b. Holding disaster drills, rehearsals and simulations;
- c. Developing techniques for training, knowledge transfer and assessments;
- d. Formulating memoranda of understanding with mutual aid agreements;
- e. Educating the public and others involved in the planning process;
- f. Obtaining, positioning and maintaining relevant material resources;
- g. Undertaking public educational activities;
- h. Establishing informal linkages between involved groups;
- i. Thinking and communicating information about future dangers and hazards;
- j. Drawing up organizational disaster plans and integrating them with overall community mass emergency plans; and,
- k. Continually updating obsolete material/ strategies
(Quarantelli 1987: 9).

In this manner, a process is created that not only satisfies the needs of the planning-agency, it also provides a forum where plans from different agencies may be integrated to fully satisfy the needs of the community.

9) *Planning to overcome resistance*: There is some evidence that emergency planning is often resisted, as Kreps has noted. There can be resistance to emergency planning by local officials for the following reasons: a disbelief that a disaster will happen; the belief that the military will assume control over the situation; overconfidence in abilities to improvise in the event of an emergency; and the diversion of resources to the planning process (1991: 36). The planning process, therefore, must also incorporate a mechanism for gaining the support of those policy makers or members of the public who may not be convinced that emergency measures are needed in the community.

10) *Planning and directing an emergency response*: Quarantelli is adamant that a good emergency response is not based upon a para-military type command-and-control model of operations where the response is constrained by rigid lines of authority. He

suggests that a well conducted response is one that follows the less structured tenets of the Emergent Resource Coordination Model (1987: 6-8). This model is fully discussed in Chapter Three.

The test of any emergency plan is its effectiveness in actual operation. Unfortunately, there is a dearth of recent Canadian research in this area. Accordingly, the following section provides examples of studies concerning the disaster response of the American Red Cross. David Neal has conducted several studies of American Red Cross response efforts, analyzing them on the principle of "Planning is a Process" (Number 8 above). The next section discusses two of these studies, his findings and his recommendations.

2.3 Emergency Response and Volunteer Organizations: the American Red Cross

As mentioned earlier in this chapter, emergency preparedness planning and management occurs, to a varying degree, at all levels of society. Unlike most public agencies, many of the volunteer-driven NGOs which provide forms of emergency social services in Canada have the option of whether or not to be involved in the emergency preparedness process: they are not required to participate as the American Red Cross is as mandated by an act in Congress. Yet, when a disaster occurs, these organizations do come out in full force in aid of their community. For the most part, these responses are lead by a small body of trained personnel, consisting of both staff and volunteers. The majority of the response personnel, however, are untrained volunteers.

David Neal has studied the emergency response activities of several NGOs, such as the Red Cross. The focus of his studies has been the improvement of emergency responses on the part of these organizations. It should be restated that the American Red Cross has a different mandate and responsibility for emergency response than The Canadian Red Cross Society. Nevertheless, the two societies have fundamental

similarities in relation to local emergency response⁵. American Red Cross local offices, which are called Chapters, are comparable to the Branch offices of The Canadian Red Cross Society in jurisdiction.

In 1990, the Institute of Behavioural Science at the University of Colorado released a monograph on short term impacts of the Loma Prieta Earthquake, which struck California on 17 October, 1989. In the chapter "Volunteer Organization Responses to the Earthquake", Neal assessed the response of local emergency services providers in the community on the basis of "the role of pre-existing and emergent social [networks] and its relationship to coordination and effectiveness of organization response"(p 91). The chapter describes the volunteer organizations involved, what activities they undertook and the degree of inter-organization coordination (p. 91).

The study took place on-site, four days after the earthquake. Interviews with representatives of five volunteer organizations and several city government members were conducted. Further information was gained from personal observation, official documents and newspapers (p.p. 91-2).

Of the five organizations assessed in this study, four were aware of their responsibilities - if not experienced in emergency response - and knew that their services would be required. They responded "immediately" (p.p. 92-5). The remaining organization, the "Trade Builders Association" (a pseudonym) was 'put on the spot' when citizens flooded their office with calls requesting building inspections. From a legal perspective, they were unable to aid in the response because building inspections first needed to be conducted by City authorities and they therefore referred people elsewhere (p. 95).

The study found that the activities of the volunteer organizations played an

⁵ American Red Cross emergency response at the national level is differently organized than it is in Canada. American Red Cross has a nationwide network of volunteers that may be prepared to respond to a disaster anywhere in the country on a regular basis. The Canadian Red Cross Society, to date, has not developed as sophisticated a network for a national response.

important part in the overall response. "The local Red Cross, amateur radio organization, and Salvation Army generally accomplished their major emergency response tasks. Their relatively effective response is due, in part, to disaster planning and their previous disaster experiences"; the local volunteer coordination centre was less effective in response because of lack of experience and training of personnel (p. 96). For the most part, these organizations worked independently before and during the disaster:

The volunteer organizations generally had little contact with each other before the earthquake.... Not surprisingly, the overall lack of pre-existing interorganizational networks inhibited the development of a coordinated response among the volunteer organizations following the disaster (p. 96).

Neal suggested that a more coordinated planning effort should be striven for in the future.

The Loma Prieta earthquake study concluded with three recommendations for volunteer emergency response organizations:

1. Volunteer organizations need to plan before disaster strikes.
2. An important part of disaster planning is working with other volunteer and governmental organizations to define tasks for the emergency period. The creation of social networks among volunteer (disaster) organizations generates numerous latent benefits... that further facilitate effective emergency response.
3. Volunteer organizations must critically appraise their response following a disaster [and incorporate "lessons learned" into the planning process] (p. 97).

The emphasis on planning as the key to a good emergency response, in addition to the improvement of social networks, is central to Neal's work.

Furthering his quest to improve the emergency response capabilities of volunteer organizations, Neal (1992-1993) assessed the "factors related to the

effectiveness of the local ARC [American Red Cross] disaster response" (p. 6) in the article "The Local Red Cross in Time of Disaster: Characteristics and Conditions of Organizational Effectiveness During the Loma Prieta Earthquake and Central Texas Floods".

As in the previous study, interviews were conducted on-site, with staff and volunteers of the Red Cross and with city government officials, within days of the disaster. "Questions focused on disaster planning and preparation, activities and tasks during and just following the disaster, and the role of (other) volunteer organizations following the disaster" (p. 8). Again, these data were backed-up with observational assessments, and relevant organizational documents (p.p. 8-9).

The Red Cross activities in both disaster events were similar: the sheltering and feeding of displaced persons (p. 10). However, the resources and materiel available to the Red Cross varied drastically. After the Loma Prieta earthquake, the local chapter response was reinforced by regional and national representatives of the American Red Cross who took on administrative duties. During the central Texas floods, the local Red Cross chapter had only one staff member and five active volunteers who were not able to recruit enough people to continue response operations for longer than a few days (p.p. 10-11).

From the perspective of those interviewed, Neal analyzed five aspects of the Red Cross responses:

1). *Effectiveness of the Local Red Cross Response:*

- a) The earthquake responders felt that the Red Cross had fulfilled its designated roles of sheltering and feeding disaster victims. They felt that intra-organizational communications channels needed to be improved (p. 10).
- b) The flood responders felt that the local Red Cross provided adequate sheltering and feeding services but they were frustrated because of the inability to continue operations

beyond three days due to a lack of volunteers. Operations were continued by Red Cross national personnel (p. 10).

2). Conditions Associated with Local Red Cross Effectiveness

2.1). Degree of Planning

a) The Red Cross earthquake responders were aware of the various risks to their community and had prepared plans, as well as participated in training. These were developed independently of other organizations. "Overall, the chapter achieved a moderate level of preparation" (p. 12).

b) The Red Cross flood responders were not prepared to respond to a disaster because they did not consider it a priority; the focus of this particular small chapter was on community health programmes (p. 12).

2.2). Degree of Previous Disaster Experience

a) The Red Cross earthquake responders were experienced in responding to disasters in the community. This was reflected in the effectiveness of their response to the earthquake (p. 12).

b) The Red Cross flood responders had negligible experience in emergency response, and this hampered their ability to respond to the flood situation (p. 12).

Neal suggests that previous disaster experience, combined with the continuous planning and formalizing of "lessons learned" from each experience, greatly aids the effectiveness of an emergency response (p. 13). However, it should be noted that he does not state how this recommendation is carried out if a community does not have previous experience with disasters or disaster response.

2.3). Interorganizational Relationships

Neither Red Cross chapter had strong inter-organizational ties. Although the earthquake responders formed ties with other organizations during the disaster (thus, enhancing their response capabilities), the flood responders did not (p. 13).

As a result of this study, Neal provides three recommendations for Red Cross response operations. First, he states that preparation is more than developing a written emergency plan:

Disaster planning is a process.... Through this process, each person develops an understanding of her/his role before, during, and following a disaster.... Local volunteer organizations should integrate planning with other emergency response and other volunteer organizations.... One initial step in this process is the development of a local Volunteer Organizations Active in Disaster (VOAD) team (p. 14).

Secondly, combined with this initial process, training and past emergency experience provides valuable knowledge for subsequent disaster events:

Following involvement in a disaster, volunteer organizations must make an honest appraisal of their disaster responses. An honest evaluation can help chapters prepare for the future.... More generally, local communities or large organizations within communities (e.g., hospitals, airports) must perform disaster drills to fulfill various regulatory or licensing requirements.... Voluntary organizations should participate in the planning, noting what services they may have to offer during or following a disaster.... Other emergency response and volunteer organizations would become aware of these activities and respond accordingly during a disaster exercise (p. 14).

Neal's third recommendation advocated the development of inter-organizational networks, so as to coordinate and improve the emergency response efforts:

The development of such networks before a disaster allows emergency response groups and volunteer organizations to identify potential resources, define emergency response tasks between (volunteer) emergency response organizations, and give managers an idea of what personalities they will be working with in other organizations.... [Inter-organizational coordination and training] may include being present at sporting events, holding an "un-disaster day" during which all local emergency management and volunteer disaster organizations gather in a location (e.g., a mall) for the public to inspect the wares, or working at small fires (p. 15).

In conclusion, Neal stated that these three activities will improve the disaster response capabilities of volunteer organizations. He stresses that inter-organizational networks

are vital to a well coordinated overall disaster response (p. 15).

2.4 Conclusion

This chapter has provided a general background in the area of disaster studies, indicating the broad scope of the field. The progress of hazards research in Geography has been discussed with particular emphasis on how it is changing to incorporate a greater social understanding in the research. An initial explanation of the temporal phases of disaster and emergency planning principles has provided the background necessary to explore the specifics of a disaster response. Finally, the chapter outlines two recent assessments of volunteer organizational response to two American disasters.

The following chapter presents the methods used in producing this thesis. It outlines the standard of analysis: the Emergent Resource Co-ordination Model.

Chapter Three

Method

3.0 Introduction

This chapter covers the topics of data collection and organization. Problems and limitations associated with the data and data collection are discussed. The frameworks for two levels of data analysis conclude the chapter. My original intent was to collect very detailed data concerning Red Cross operations in both disasters (see Ethics Proposal, Appendix "B"). Data availability forced this research to change in focus, but not in overall topic (see section 3.3 Problems and Limitations). Obviously, the conclusions reached in this study should not be considered universal but representative of the case studies presented: "no generalizations from a single case study can be definitive, but any case study,... can provide some evidence that will contribute to answering the broader questions" (Stevenson 1987: 210-11). The majority of the data used in this research was gained through interviews with several emergency services responders who participated in the respective tornado disasters. Hence, this has resulted in an empirical, participatory account of Red Cross activities as opposed to a statistically based research project.

3.1 Sources

The majority of the documentary data were collected in person, when the office in question was geographically accessible. The remainder of the data gathered were sent to me by Red Cross staff and volunteers, as well as the interviewees, due to the restrictions of budgetary considerations and the availability of persons interviewed. Data were collected over a period of five months, June 1994 to October 1994, inclusive, in both primary and secondary data form.

3.1.1 Documentary Data

Data were collected from The Canadian Red Cross Society from branch, division, and the National offices. Branch offices in Barrie, Ottawa and Metro Toronto, Ontario and Edmonton, Alberta provided documentation such as interim and final operations reports, newspaper-clippings files, organizational documents and internal memos, as well as emergency services meeting minutes. The Ontario and Alberta-Northwest Territories divisional offices, in Mississauga, Ontario and Calgary, Alberta respectively, provided further documentation in terms of photographs and situation reports (where available). The Canadian Red Cross Society National Office in Ottawa granted me access to its private library to research secondary data, as well as the Red Cross records files, concerning the tornadoes and general emergency services policies and procedures.

Considerable source material regarding both general issues in the two tornadoes and specific tornado related topics, was provided by the Emergency Services division of Health Canada. In addition to the data on Red Cross operations, much of the documentation concerned the health services response to the tornadoes, specifically the establishment of support groups for families and children to help them deal with issues of critical incident stress. Although not included in this thesis, there is sufficient information available to conduct an entirely separate study.

Alberta Public Safety Services, in Edmonton, provided further information on critical incident stress plus government publications on the Edmonton Tornado response. The national training academy of Emergency Preparedness Canada, in Arnprior, Ontario, supplied secondary source material concerning various disasters in Canada.

Lastly, from the City of Barrie Social Services and Fire departments I acquired photographs and City by-laws.

3.1.2 Interview Data

Personal interviews were conducted with participants from Barrie, Ontario and from Edmonton, Lethbridge and Calgary, Alberta. Interviews were conducted either in person and/or over the telephone, depending upon the geographical location of the interviewees and their schedules. Although specific questions were provided for the interview (see Appendix "C"), for the most part, the interviews were unstructured and the interviewees talked at length on any topic. The interviews consisted of up to twenty one questions. What the interviewees answered depended upon the relevance of the specific questions to the interviewees' involvements with the specific response operations. In general terms, the questions progressed in scope from the roles and responsibilities of the interviewees in the disaster response through to an assessment of Red Cross activities, concluding with an opinion on the part of the interviewees as to the state of preparedness of the Red Cross in the event of an emergency "today".

Prior to being interviewed, all participants were required to provide written permission for the recording, transcription and use of the interview data in this research (see Informed Consent, Appendix "D"). All interviews were taped, (with permission); then later transcribed for reference.

In total, nine interviews were conducted. Approximately fifteen hours of tape, (sixty hours of transcription time), were recorded resulting in fifty seven typed, single-spaced, pages of transcripts. Five of the interviews were with people connected with the Edmonton Tornado response, four were connected with the Barrie Tornado operations. Of the four interviews concerning the Barrie response, one was with a former public official who refused to comment on the response operations of any one, individual, volunteer organization.

3.2 Data Organization

The secondary data collected on the tornado disasters are combined with primary documentary data and interview data on the operations of the organizations as a whole. This provides an understanding of the organizational and urban communities as they were affected by the disasters and creates a basis on which to assess the emergency response operations of the Red Cross branch offices (see Chapter Four "Case Studies"). These data are assessed in Chapter Five, in accordance with an adapted version of the Emergent Resource Coordination Model (see section 3.4 Data Analysis).

3.2.1 Personal Information

Any personal data that may be used to identify individual respondents or victims are dealt with in an aggregated and/or generalized manner, so as not to identify any one individual without their permission. Where interviewees explicitly consented to the use of their names, names are provided (see Informed Consent, Appendix "D"). Graphically, the areas affected are portrayed in general neighbourhood terms where no one house is identifiable on a map in terms of street names or occupants; only main thoroughfares are identified where necessary.

The data which was available, have been organized to produce as clear a picture as possible of what occurred in both tornado disasters, in terms of the damaging event, the Red Cross preparedness and the Red Cross emergency response.

3.3 Problems and Limitations

The problems and limitations experienced in collecting these research data fall into three general categories: availability of primary source material, institutional turnover and secondary source material availability.

Primary source material is original documentation and interview data. The first problem encountered in gathering document data was that of availability on the part of the Red Cross and the my own high initial expectations. Much of the information in

which I was interested was not available in documentary form. Either these documents never existed or they were disposed of after the emergency response operations. Some documents that at one point did exist were misplaced or not available through a Red Cross office. Of the documents that were available, there was evidence of poor record keeping and a haphazard communication of information between various levels of the Red Cross. For instance, Branch, Division and National Red Cross offices all had a different collection of documents on the Barrie tornado response. No single office had a complete account of what the Barrie Branch did in response operations.

The problems associated with interview data and interviewees were twofold: life and scheduling, as well as the degree of willingness to participate in the interview process. Firstly, people have lives. Interviewing had to be scheduled into the lives of the people who consented to be interviewed. This, in conjunction with the ethics procedures associated with interviewing and the further complication that many interviews were conducted as long distance telephone conversations, caused the entire process to stretch for several months. Secondly, people move and when they move between households they do not always provide a change of address or another way of being located. As a consequence, some people were just not available to be interviewed.

The willingness to participate in the interview process is important in relation to the Barrie, Ontario case study only. In 1987, the entire volunteer Board of Directors of the South Simcoe Area Red Cross resigned for reasons that were not clear to the staff director at the time of this research. Only one 1985-member of the Barrie Red Cross was willing to be interviewed and he did so reluctantly. Likewise, with these resignations an "institutional memory" was lacking on the part of governing volunteers of Red Cross activities. Therefore possible recourse to documentation not held in the branch office archives was not available.

Institutional turn-over posed the second problem. Through various forms of

attrition, staff and volunteer members of an organization leave; on occasion, documents are taken with them. In the case of volunteer organizations, many volunteers keep documents related to their individual projects at home. The process of moving from one building to another also creates an opportunity for documents to be misplaced or discarded.

Secondary source material, such as published accounts of the tornado response operations, were limited. The Barrie tornado is remembered in a special edition of the Emergency Preparedness Canada Digest. The Edmonton tornado was written about more, although not extensively. Local newspapers focused on the human-interest aspects of the stories rather than putting a heavy emphasis on the response efforts. Much of the time, descriptions of response activities were minimal and still tended to view the human-interest aspect of the situation. For example, articles would relate how much food and clothing was donated, illustrating the community pulling together after the disaster, rather than a detailed description of how the food and clothing was distributed to the victims.

These three aspects when combined, resulted in an extensive amount of data being available, although not all of it was directly or obviously relevant to this research. At the end of the data collection period, the quality of the interview data which I had collected balanced the primary documentary data.

3.4 Data Analysis

The ability to provide an effective humanitarian response in a disaster situation is based on coordination. Personnel and resources may be available but without direction this materiel is useless. Quarentelli (1987: 6-8) describes two methods of organization: the Command and Control model, a highly centralized militaristic mode of operation and the Emergent Resource Coordination Model, where a loosely planned structure exists which allows individual components to develop with the situation as

the need arises. He notes the failure of the Command and Control model in the facilitation of emergency response due to its rigidity of structure and misconceptions of disaster behaviour:

[T]he command and control model assumes that disasters create a tremendous discontinuity with everyday life which lowers the effectiveness of individual behaviour and reduces the capacities of the social organizations involved. Given this, planning is centred on the development of mechanisms to control supposedly widespread maladaptive individual behaviour and on the creation of ad hoc structures to replace the supposedly disrupted and nonfunctioning social organizations in the disaster area (p. 7).

Quarentelli goes on to state that this approach attempts to impose a new normality on the social structure of a disaster affected area. This type of response is directed from the perspective that the behaviour patterns of all individuals will change in every aspect as the result of an emergency. Therefore, the command and control model of response aims to impose new rules of conduct on the disaster stricken populace (see Chapter Two, section 2.2.2 #5 concerning myths and misconceptions in emergency planning).

Conversely, the Emergent Resource Coordination Model is based on the premise "that in disasters there is less discontinuity with everyday life than is frequently supposed...[and] disaster victims maintain, as much as possible, their traditional activities and their usual occupational and family responsibilities" (Quarantelli 1987: 7). The objective of this mode of operation, therefore, is to utilize existing community structures and the resultant response mechanisms, coupled with mandated agency responses.

3.4.1 Developing The Emergent Resource Coordination Model

The Emergent Resource Coordination Model, as outlined by Kreps (1991: 45), provides a broad frame work of response objectives:

- i. Efficient mobilization of personnel and resources*
- ii. Timely communication of information within and between local clusters of*

organizations

iii. Timely communication with the public

iv. Resolution of conflicts over goals, tactics, and resources

v. Effective interaction with regional and national government units when needed

vi. Effective exercise of authority when needed.

Kreps does not say definitively how this is to be operationalized. It can be compared to a series of conceptual boxes with no specific contents, as the objectives will differ from one organization to the next. This model is aimed at the government arm of operations, as is indicated by the terminology in the fifth point although the model is general enough making it easily adapted for any response agency.

For the purpose of this research, the Emergent Resource Coordination Model has been expanded and operationalized, based on the concepts discussed in Chapter Two, my three years of direct personal involvement in emergency services and from observational experience:

i. Efficient mobilization of personnel and resources

The general requirements for the efficient mobilization of personnel and resources include an organized response-personnel base, a material resource base or access to others' resources (for example: R&I materials, vehicles and food). A method of call-out is required for mobilizing volunteers as well as an organized transportation network for the distribution of emergency goods (such as food) or for mobile registration. Additionally, some sort of communications network needs to be devised and employed to assure efficient communications within the responding organization, with other responding organizations and with the general public. Much of this organization is based upon the level of training the responders have received, the amount of previous experience on the part of the organization (either through real disaster situations or simulations), the level of operational-organization the response team(s) has and the previous and pre-disaster planning the organization has conducted.

ii. Timely communication of information within and between local clusters of organizations

The general requirements for maintaining timely communication within and between local clusters of organizations call for a designated liaison(s) who will meet with representatives of other organizations (possibly at an EOC - Emergency Operations Centre) and disseminate information both to these organizations on the response operation, as well as gather similar information from these other agencies to keep an up to date picture of the response operations at large. There should be some sort of meeting schedule/ process for responders internal to the organization where topics of concern to the response operations may be discussed on a regular basis as well as updating responders on the operations as a whole. A designated communications method is preferable as public utilities cannot always be relied upon during an emergency. This may take the form of an emergency radio network (and the possible association with an amateur radio group), designated direct-dial telephone lines and runners or message carriers. To facilitate this, organizations must realize the need to cooperate in both the planning and operational aspects of emergency response.

iii. Timely communication with the public

The general requirements for timely communication with the public include designating a spokesperson(s) or community liaison, who is knowledgeable about the specific response operations of the organization, who will be able to make announcements to the general public and answer questions from the media through public service announcements (PSAs) on television or radio or via printed media of newspapers or handbills. Information telephone lines may be set up; information may also be disseminated to the public by field representatives or other authorities (such as the police, fire, or social services representatives). Initial communication with the general public should take place as soon as it is technologically possible to alert the public of organization's services, reception locations and the like. The public should be updated on a regular basis or as the need arises.

iv. Resolution of conflicts over goals, tactics, and resources

In one sense this is the whole process of emergency response. The general requirement for the resolution of conflicts over goals is problem solving by means of innovation and adaptation within the organization's means and the coordinating structure of the emergency response. The organization's personnel should have the flexibility of training to take over jobs that were not originally designated for them when necessary, as well as the ability to learn during response operations and not shirk unexpected responsibilities because of inexperience.

v. Effective interaction with regional and national [parent] agency units when needed

The general requirement for assuring effective interaction with regional and national parent agency units is the ability to maintain a vertical information flow (through (a) designated liaisons). The provision of a "chain of command" communications system is not only essential within an organization but between different levels of the same organization. This is important in terms of exercising authority, disseminating information and the acquisition of resources not available at the local level.

vi. Effective exercise of authority when needed

The general requirement for judging the effective exercise of authority in an emergency situation is the ability to recognize the need for an authoritative action to alleviate a disruption. The exercise of authority should not add to the disruption which already exists. Leadership or lack of it, may end up characterizing the response operations for an individual agency as a whole.

This framework is used to assess the emergency services activities of the two Red Cross branch offices discussed in the case studies. Following the individual assessments, a comparative analysis is provided.

3.4.2 Comparative Analysis

A brief secondary analysis will compare emergency response operations of the two Red Cross branch offices on the basis of preparedness, response and the intraorganizational communication of information.

3.5 Conclusion

Chapter Three has described data acquisition and organization as well as the problems associated with the data and data gathering process. Two methods of analysis have been established for the assessment of emergency services response operations. The following chapter describes the tornado disaster case studies.

Chapter Four

Two Tornado Case Studies

4.0 Introduction

This chapter describes the tornado disasters in Barrie, Ontario and Edmonton, Alberta. A general introduction to the phenomenon of tornado storms opens the discussion on the specific case studies. The case studies are discussed chronologically. Each case study covers three topics: an overview of the tornado disaster, the preparedness level of the two specific Red Cross branch offices directly involved in the disaster response and the response operations of the Red Cross to the tornadoes. Where applicable, interview data have been incorporated into the descriptions so as to expand on details not provided elsewhere.

4.1 Tornadoes

According to statistics compiled by Emergency Preparedness Canada (January 1993), there have been 14 tornado disasters in Canada since 1900 (not including Aylmer, Quebec in 1994)¹. Of these, 6 occurred in Ontario and 1 in Alberta with the remainder occurring in Quebec, Manitoba and Saskatchewan. All of the tornadoes occurred between the months of April and August inclusive (p.p. 34-35).

Tornadoes may occur during large thunderstorms where there is a "juxtaposition of layers of air with great contrasts in air temperature, moisture and wind" (Briggs and Smithson 1986: 104), creating an "internal structure of updrafts and circulation" (Eagleman, et al 1975: 2) conducive to cyclonic activity. This then may produce a funnel cloud which is suspended from the base of a cumulonimbus cloud, that is called a tornado when it touches the ground. Heavy storm activity may create one or more tornadoes simultaneously or sequentially (Alexander 1993: 172).

¹ These statistics deal only with tornadoes that have affected human populations resulting in disasters. Annually, numerous tornadoes occur in Canada in unpopulated areas and do not result in a disaster

Strahler and Strahler (1978) describe a tornado as an:

intense cyclone in which the air is spiraling at tremendous speed. It appears as a dark funnel cloud... hanging from a cumulonimbus cloud. At its lower end, the funnel may be 100 m to 500 m (300 to 1500 ft) in diameter.... Estimates of wind speed run as high as 400 km (250 mi) per hour. (p. 118)

The path of a tornado may stretch up to 20 km in length (Briggs and Smithson 1986: 104). As a tornado moves across the ground, it picks up dust and debris while it destroys anything in its path. This debris adds to the dark colour of the funnel cloud. Although the destruction is extreme, it is also localized, confined to the path of the tornado and the immediate area. Plates #1, #2 and #3 show graphically the destruction a tornado may create and how that destruction can be localized to the tornado path.

Plate # 1
Arial View of the Path of the Barrie Tornado

Plates # 1, # 2 and # 3 show damage caused by the Barrie Tornado in May 1985. The photographs are reproduced here courtesy of The Canadian Red Cross Society, Ontario Division, Emergency Services.

Plate # 2

Structural Damage Caused by the Barrie Tornado

Plate # 3

Selective Damage Caused by the Barrie Tornado

The severity of a tornado storm is classified according to a point scale which links damage to wind speeds:

[The] relationship between wind speed and risk has been recognized for many years, but until 1971 there was no system in place to deal with it, quantitatively. After the Lubbock, Texas tornado of May 11, 1970, Professor Fujita of the University of Chicago devised a six-level scale that relates wind speed ranges to various degrees of structural damage. (Grazulis 1993: 141)

In very simple terms, the Fujita Scale delineates tornado intensities in the following seven categories:

F0 Gale tornado: wind speeds range from 40 miles per hour (mph) to 72 mph causing light damage.

F1 Moderate tornado: wind speeds range from 73 mph to 112 mph causing moderate damage.

F2 Significant tornado: wind speeds range from 113 mph to 157 mph causing considerable damage.

F3 Severe tornado. wind speeds range from 158 mph to 206 mph causing severe damage.

F4 Devastating tornado: wind speeds range from 207 mph to 260 mph causing devastating damage.

F5 Incredible tornado: wind speeds range from 261 mph to 318 mph causing incredible damage.

F6 Inconceivable tornado: wind speeds range from 319 mph to 379 mph causing damage that would only be identifiable by ground swirls that would not be separable from the previous three tornado ratings or identifiable through engineering studies. (Grazulis 1993: 141)

After a brief geographical comparison of the two cities in question, the remainder of this chapter relates, in chronological order of occurrence, the devastation of the 1985 and 1987 tornadoes, the level of preparedness of the Barrie and Edmonton Red Cross emergency services programmes and the activities of these Red Cross branches in their responses to the respective tornado disasters.

4.2 Geographical Differences Between Barrie, Ontario and Edmonton, Alberta

The cities of Barrie, Ontario and Edmonton, Alberta have several geographical differences. The City of Edmonton is situated in the Canadian Prairies and the City of Barrie in the Great Lakes-St. Lawrence region of Central Canada. In terms of size, the census metropolitan area (c.m.a.) of Edmonton, the capital city of Alberta, had a population base of over 500,000 in the mid 1980s (Matthews and Morrow 1986: 93-4), whereas the City of Barrie, situated approximately 80 kilometers north of Toronto in the Lake Simcoe area, had a population of approximately 25,000 at that same time (Matthews and Morrow 1986: 97-8). As the capital city of Alberta, Edmonton is the political administrative centre for the province, hence, several levels of government are located in one centralized place. Not only the provincial bureaucracy and that of the City of Edmonton are situated here: ten other cities and towns are also included in the c.m.a. (Matthews and Morrow 1986: 177). On the other hand, the City of Barrie has one main layer of government, that being of the city itself, as well as representation from some provincial government departments, such as Community and Social Services. Although overshadowed by the c.m.a. of Toronto, the City of Barrie is the largest urban centre in the Simcoe Area and it aids in providing essential services to outlying areas. For example, the Barrie Fire Chief has an administrative responsibility for the Simcoe Area (McAllister 1994). Barrie may also be considered a bedroom community of Toronto, connected to the city via the "GO Train" (a commuter train), which suggests that many of Barrie's residents work in the Greater Toronto area. The City of Edmonton differs from Barrie in terms of population, size, levels of political bureaucracy and availability of resources, human or otherwise.

4.3 1985 Tornado

The City of Barrie, Ontario, is located on the West side of Lake Simcoe, on Kempenfelt Bay. The path of the tornadoes moved from the west to the east, terminating over the bay. The 1985 Barrie Tornado affected the south section of the city. Emergency Preparedness Canada states that the tornadoes killed 12 people, injured 500 people, left 800 people homeless and caused \$117 million in property damage (Emergency Preparedness Canada 1993: 35).

In June of 1985, the Ontario Weather Centre of the Atmospheric Environment Service department of Environment Canada released a report on the tornadoes that struck Southern Ontario on 31 May 1985. The report was constructed from "on site investigations or aerial surveys of the tornado paths during the week following the tornado outbreak" (Lawrynuik, et al 1985: i). The following technical information on the Barrie Tornado has been summarized or excerpted from that report:

On 31 May 1985 several areas in Southern Ontario were affected by severe thunderstorms and tornadoes as the result of unstable weather conditions over the Central United States and Lake Erie. A total of 9 tornadoes were reported in Ontario on this day (Lawrynuik, et al, 1985: 4). The Barrie area was heavily affected by the storms:

About 4:10 p.m. a funnel cloud dipped down from a severe thunderstorm in Egremont Township about 4 km southwest of Hopeville. For the next 50 minutes the severe thunderstorm travelled east-northeastward at 75 km/h over a distance of 85 km. It appears to have generated a series of 5 tornadoes which culminated in the devastating storm which struck southern portions of the city of Barrie. It is also conceivable that the damage paths could have resulted from one or two tornadoes touching down more than once. (Lawrynuik, et al, 1985: 5).

This set of tornadoes affected the townships of Hopeville, Corbetton, Lisle and Essa as well as the City of Barrie. Buildings were destroyed in all areas except for Essa; Barrie suffered the most damage. Much property was destroyed: an entire plantation of ten

meter tall pines, numerous houses, twelve factories, a townhouse complex, four warehouses as well as thirty-five sailboats, plus the concrete moorings in the marina, all "disappeared". Another housing complex, four factories, the racetrack grandstand and the horse barns at the racetrack all suffered damage on a lesser scale (Lawrynuik, et al, 1985: 6).

Environment Canada estimated that, at times, the tornado wind speeds were in excess of 400 kilometers per hour (248 miles per hour) and that the tornadoes cut swaths through the landscape ranging from 50 meters to 600 meters in width (Lawrynuik, et al, 1985: 6).

Plate # 4
The Path of the Barrie Tornado

This illustration was reproduced from a slide courtesy of Fire Chief J McAllister, City of Barrie Fire Department

4.3.1 Red Cross Preparation

Prior to the tornado, The Canadian Red Cross Society, South Simcoe Area Branch, had an active Emergency Services programme, which was put in place in 1979. As a result, Red Cross volunteers had already participated in several emergency

response operations in the area. For example, in 1981, the Emergency Service team provided accommodations for 240 people stranded by a snowstorm and in 1982 accommodations were provided for 25 people who were displaced due to a fire in a high-rise (The Examiner 30 March 1984). That same year the Branch provided assistance in the clean up operations after a train, which was carrying chemicals, derailed.

The person who held the position of Chairperson of Emergency Services describes the level of Red Cross preparedness as at 1985:

We started in '79 and our training, on the job training,..., was going out at two and three and four in the morning in winter time to fires and displaced people and snow storms and the rest of it. So that took the rough edges off what we thought we might have to do.

And our first big trial was the Medote train derailment. We were ten continuous days at that one. So the team really got a work out then. It was 30 [degrees Celsius] below zero, that's what it was. The closest concession road was a quarter of a mile from the wreck. The closest water was a mile.... So, we fed them around the clock for 10 days. We had feeding shifts go out, it's about 5 miles from here [Barrie], we had feeding shifts at noon and four o'clock and midnight and four in the morning. They never left. They pumped the fire for 10 days straight. Anyway, that was our baptism of fire. We learned how to feed. We set up shelters at Georgian College, because they evacuated everyone from 5 miles around the wreck. And those who didn't have any place to go came into Georgian College. There was a reception centre there.

In the snow storm business we learned how to run shelters. And we learned how to handle people, if you like. How to put in their time, and sit in front of the walls. Managing the shelterees. You get a hundred people in the shelter, what do you do with them?

The question, were we ready? Yes, we were ready. (Skelding 1994: Interview)

This opinion was echoed by both the city Fire Chief and the Director of Social Services for the City of Barrie, although the Fire Chief questions the current Red Cross level of preparedness:

I think the Red Cross has a lot of facilities available. I think they were prepared then, whether they are now I will put a question beside that because we haven't had an exercise. (McAllister 1994: Interview)

The city Social Services director believed that the Red Cross responders were more equipped than his own staff to deal with the issues of immediate social services needs on the day of the tornado. His staff assisted the Red Cross in the emergency response:

Well, members of the Red Cross, and I can't remember particularly who, we met and it was apparent from the initial discussions that I had with folks from the Red Cross that as far as providing shelter and clothing and food and transportation and human resources, whatever it was that had a social services ring to it, they were far and away far superior, from an organizational point of view and a practical point of view, than I ever would have been.... So, I sort of turned my responsibilities, with the Council's approval, over to them. (Calvert 1994: Interview)

The level of preparation was evidenced in how the Red Cross conducted emergency response operations after the Barrie Tornado. The previous training, planning and experience of the Barrie Red Cross volunteers prepared them for the roles they would fulfill in the 1985 response activities. The following section provides an overview of the Barrie Red Cross response to the tornado.

4.3.2 Red Cross Activities

The 1984 Barrie Red Cross Emergency Services plan formalized the Emergency Services responsibilities of this particular branch office:

1. To assist the fire department and/or the police department upon request, in any day to day occurrence that may not be an officially declared emergency.
2. To assist the community, when, where and for as long as requested, where municipal officials have declared an emergency under the present city by-law. (Barrie Branch Emergency Services Plan 1984: 1)

The bulk of the Red Cross emergency response in the Barrie area was handled by the local Red Cross branch. The local branch received assistance from the Toronto area

branch volunteers who fielded over 5000 inquiry calls in the first six days of the disaster (Syer, June 1985: 1-2). The following, italicized section, is a summary of the formal Barrie Red Cross operations (Skelding 1985), 12 page report². Where applicable, interview data (boldface) has been incorporated to expand on details not covered in the original report.

By 5:00 p.m., within an hour of the occurrence of the tornado, Friday 31 May 1985, the Barrie Red Cross branch Emergency Services team was activated by request of the Fire Department. The Red Cross responders were asked to manage four shelters, conduct mass feeding operations, and provide R&I services.

They were excellent, there's no question about it. And, I give full credit to that to Doug Skelding because I don't know whether they would have been on the ball to ensure that everything was in place. ... In his case he said "What do you want?", I said "We need the whole thing!" and I didn't have to say "registration" or "shelter" or any of these things, he just called his team together and what a great job they did. (McAllister 1994: Interview)

Of the initial four shelters, two were without power and one was operational but not used by those displaced by the tornado. All shelter activity was transferred to the fourth location, an armoury, by the second day of operations. One of these former shelters, a church, continued to operate as a food preparation site and bulk food depot, with the help of the church group. By 0300 hours on Saturday, all remaining displaced persons were moved to the armoury, registered and billeted by 0400 hours, at which time the remaining shelter closed.

By the time that the evening [of 31 May finished], by 11:30, I think the tornado came through about 5:30, by 10:30, eleven o'clock, people who had been displaced had been taken care of. Most of whom, by the way, had been taken to relatives, but still, someone had to coordinate that, and the Red Cross did that. So anyone who had been displaced had been taken care of by 10:30, eleven o'clock, no later than midnight that night....

² A full copy of the Barrie Red Cross tornado report is available upon request from the researcher or her supervisors

For those who had not been injured in any way, and had simply been displaced, the Red Cross, along with my small group [from the City's Social Services department], and quite frankly, we were there in a support role only, all of them had been relocated by that evening.... I'm not sure what [Red Cross] did on the Monday, we took care of the [long-term] housing. And over the weekend that's what we decided we would do, they would continue to help with the clothing and the food and those sorts of things that were needed on an ad hoc basis. (Calvert 1994: Interview)

Amateur radio operators established an emergency radio network, operating out of the Red Cross branch and all shelter locations. This became a necessary mode of communications, both internally and externally, as phone lines were down immediately after the tornado.

Concurrently, Red Cross and other volunteers were inundated at the shelter locations with donations of food, clothing and furniture. Local television and radio media broadcast unsolicited requests for donations, causing this convergence. This caused the inconvenience of having to divert volunteers from other jobs to deal with this influx of goods.

Couple of hours after the tornado hit, I couldn't believe the numbers of people who were there, volunteers from the Red Cross and elsewhere. And the number of or the amount of food and clothing that had come in was unbelievable... The Red Cross were top notch in the way they handled things from the outset. (Calvert 1994: Interview)

By the afternoon of the 01 June 1985, 9 truck loads of food (packaged in family sized portions) were delivered to another church for distribution, and the clothing and furniture were diverted to other volunteer social service agencies better equipped to deal with them.

Throughout this process, R&I was operating on a continual basis. A local electronics chain store donated the use of a computer and an employee to operate the data entry for this purpose. By Monday, the 03 June, R&I became the main function of the Red Cross. The telephone company donated the use of two desk spaces and "assistance in the operator services area in the adjacent switching centre" (p. 8) to accommodate call-backs³. Red Cross volunteers conducted call-backs, 12 hours a day, from 04 to 16 June.

³ "Call-backs" are the calls placed to friends or relatives, who placed inquiries with the Red Cross, to inform them of the safety or whereabouts of their family members.

On 07 June, the Red Cross was requested by the City to conduct mass mobile feeding operations in support of the Mennonite Disaster Services personnel who were travelling to Barrie to aid in the clean-up operations.

So we ran a giant mobile canteen food service. If one van ran out of food, it would radio in. We'd pick up another van that had surplus and send them in to take over. And that's the way it worked. We were in that for [approximately] two weeks. For anybody who was working to clean up. Any body who was working.... It didn't cost us five cents for the food. It was prepared. I can't remember where it came from, it dropped like manna from Heaven. Anyway, we called it Operation Loaves and Fishes. We started out with a little bit of food and we never seemed to run out. Stores, eh, would send stuff in.... We didn't have any displaced people to feed, but we fed the support services. Otherwise, I don't know how they'd have got fed. The City was not prepared for reasons known only unto themselves. (Skelding 1994: Interview)

The local Red Cross arranged for several Red Cross vehicles to be borrowed from neighbouring branches for this operation. From 10 to 16 June, the Red Cross distributed food for 500, three times a day. The Red Cross also arranged for the Mennonites to be billeted at the vacant nursing college.

After 17 June, Red Cross operations consisted of providing 50 meals per day (p. 12) to relief workers until their clean-up tasks were finished. R&I operations continued after this date until all call-backs were completed⁴. Red Cross debriefing sessions for Red Cross staff and volunteers were conducted 7 July (Skelding July 1985: Memo).

In all, the Barrie Red Cross was involved in response operations, in varying degrees of mobilization, for over a month. In that time Red Cross volunteers supported not only the victims of the tornado and their families through R&I functions, feeding, clothing and the provision of emergency funds but they supported other support services which conducted emergency response operations in the City of Barrie and the surrounding areas.

⁴ Both the Interim and Final reports end on 17 June, within the text, although the Final Report quotes the operation date as lasting until 27 June 1995. This could easily be a typing error on the part of the producer.

4.4 1987 Tornado

The 1987 Edmonton Tornado⁵ was the worst tornado disaster in Canada since the Regina tornado of 1912 which killed 28 people (Vanstone 1987: 1, Emergency Preparedness Canada 1993: 34). The Edmonton Tornado caused \$300 million in damages, killed 27 people, injured 600 and left 1700 people homeless (Emergency Preparedness Canada 1993: 35). Six hundred people were left without employment (Vanstone 1987: 1).

At 1455 hours a tornado dropped to the ground.... It struck... near Beaumont as the "Edmonton tornado" and remained on the ground for an hour over a 40-kilometer (25 mile) path.... The track of damage exhibited rather large variations in width from a few tens of meters up to more than one kilometer. Tornado intensity estimates based on damage observations ranged from F0 (light) near the edge of the track to F4 (devastating) in intermittent patches near the centre of the track. (Hage 198-: 12)⁶

The tornado affected four significant areas to the north-east of Edmonton: two residential areas, a mobile home park and an industrial park (Vanstone 1987: 1).

4.4.1 Red Cross Preparation

Unlike the Barrie Red Cross, which had been called upon to respond to much the same situation two years prior, the Edmonton Red Cross Branch was only marginally prepared to conduct an emergency services response. The former Director of Disaster and Social Services for the province of Alberta, commented on the level of preparedness of the Edmonton Red Cross Branch:

They were not prepared because they didn't have a mandate, they didn't have anyone telling them what was their role. And because they didn't have anyone, they were not as prepared as they would have been if someone said "You guys are going to do this." So they were looking for clarification as to what their role would be. There had been one training session I had done for the Red Cross a few months before. Probably Spring of that year. And in that one we covered a lot of stuff and again,

⁵ For a related study concerning mass casualty management during the Edmonton Tornado, see Scanlon 1987

⁶ There is no date listed on the publication. It stands to reason that the publication was produced shortly after the Edmonton Tornado of 1987, hence the blank in the date

what we covered was not their role but the municipal role for disaster response for all five services. (van Goethem 1994: Interview)

This was echoed by the former President of the Edmonton Red Cross Branch with respect to training and resources:

So as far as Red Cross goes, 'no', none of us were prepared because there had been no training or role establishment in disaster response, in the Edmonton Branch of the Red Cross prior to the tornadoes....

[And] if the question is purely: was the Red Cross adequately prepared to facilitate us in this role, the answer is no. Material wise, people wise, plan wise, no wise, okay? We had never even considered what we would do if a tornado happened to trash part of Edmonton. We knew how to package toothbrushes for fires. We had, I suppose some... We went from toothbrushes to tornadoes overnight, actually we went there in about half an hour. So it's like we were flying along in an airplane over the pole to a vacation in the Mediterranean, and over the pole the plane crashes and we're all of a sudden in the Arctic and we're dressed in Bermuda shorts and a t-shirt. And, we had to deal with it. (Tyre 1994: Interview)

Although now aware of the greater scope of emergency response on the municipal level, the Edmonton Red Cross did not officially establish the role of Emergency Response Chair until June of 1987 (Tyre 1994). It was not until the day of the tornado that supplies were acquired to fulfill the main function of a Red Cross response: Registration and Inquiry. The following anecdote is widely told in the Alberta emergency services community. Four of the five people interviewed for this research relayed this same story:

There was a general awareness of what needed doing. We had known that Emergency Services was a function of Registration and Inquiry, getting people together, family members and that sort of thing. And we had a bit of training in it. So we went to the Alberta Public Safety services one day and asked if they had any ideas or suggestions as to what forms we should be using for tracking this information. And, they said that as a matter of fact there is. The federal government puts out a form and they just changed it from a two copy form to a three copy form. He said they hadn't thrown out the two-copies, so he said "If you want, I'll give you the old copies." So we went over there and picked them up at noon on the day of the tornado. So in a way it was good management. So, to answer your question, yeah, basically, there was a general awareness, but we really weren't very prepared. (Vanstone 1994: Interview)

Regardless of the lack of preparation, the emergency response of the Edmonton

Red Cross Branch was extensive and impressive. The Edmonton Red Cross volunteers had little or no experience in responding to large scale emergencies. With the exception of R&I functions, much of the response activities of the Red Cross were conducted on an ad hoc basis. The following section summarizes the roles and activities of the Edmonton Red Cross during the 1987 tornado response.

4.4.2 Red Cross Activities

Considering the level of preparedness, the emergency services response operations of the Edmonton Red Cross Branch were effective. Two coincidences occurred on 31 July 1987 which greatly increased the Red Cross response ability: the acquisition of the Registration and Inquiry cards, as well as the on-site presence of the Branch President and the Director. The Branch President was an emergency management consultant:

At the time that I had control, I had a private consulting practice and my area of expertise was disaster management. I happened to be the right person in the right place at exactly the right time. It was one of those times that you say "my god, this is the whole reason why I spent my life doing this". (Tyre 1994: Interview)

On the afternoon of 31 July, both the Branch Director and President were planning on leaving for their holidays:

And on our side I believe that we were very lucky, because I happened to come on scene and because [the director] happened to still be there, [he] was leaving on vacation and so was I. As a matter of fact, when the tornado hit I was on my way downtown with the car loaded to pick up my wife from an office across the street from Red Cross to go on vacation for 2 weeks. An hour later, we would have been on the highway, the radio would not have been on, and we would not have heard for a minimum of probably 2 weeks that a tornado had occurred. [The director] was only in the office that day because he and I, earlier that morning, had been working on the annual budget. He was supposed to be on vacation. He would have been out of the city on vacation. The question we have always asked ourselves, was because there was no plan, or defined roles of what we should do, if either one of us had been away, what would people have done? (Tyre 1994: Interview)

The Edmonton Red Cross Director and President both played integral roles in supervising the branch's response to the tornado. Their collective experience in personnel management and disaster management provided the necessary direction which made the Red Cross response that much more successful.

The Edmonton Red Cross had only expressed interest in city-wide emergency response in recent months preceding the tornado disaster. Red Cross personnel were not designated a role in the City plan (van Goethem 1994: Interview). Therefore, in addition to providing R&I, Red Cross people became "floaters" in the emergency response operation:

While agencies of the provincial and municipal governments assumed responsibility for the long-term care of victims, Red Cross was continually asked to solve immediate problems as they occurred. Red Cross workers became "fixers", constantly finding ways to provide for the needs of the hundreds of people victimized by the tornado. (Vanstone 1987: 1)

Below is the, italicized, summary of the 8 page Edmonton Red Cross final report, "Report on the Red Cross Response to the Tornado, July 31, 1987, City of Edmonton, Alberta" (Vanstone 1987), outlining the response activities to the tornado⁷. Additional information is incorporated from interviews.

The main Red Cross emergency response took place from Friday 31 July through Sunday 02 August 1987. Auxiliary response activities took place from Monday 03 August to Monday 10 August 1987.

By 4:00 p.m., within an hour of the tornado, the Edmonton Red Cross Branch began emergency response operations. The response employed over 650 volunteers and staff. The Red Cross received a total of 11000 inquiries - matching 5000 of them. Emergency accommodations were found for 89 displaced people; the Red Cross fed over 600 volunteers for over the ensuing week.

⁷ A full copy of this report is available on request from the researcher or her supervisors.

The Red Cross provided R&I, food delivery and assistance at the Victim Assistance Centre.

Two occasions of convergence occurred during the operation:

1) The Edmonton Red Cross was inundated with telephone calls after the news media (with permission of the Red Cross) broadcast the branch telephone number. All ten phone lines were jammed with incoming calls. The call rate averaged 300 calls per hour. The telephone company temporarily installed eight more lines into Red Cross House. Two of these lines were then designated as outgoing lines for the command centre. Also, a telefax system was installed:

For instance, all our phone lines were jammed. Couldn't get calls out. So what we did was, my wife's office was across the street. So I said to my wife who was working with us, "Go over to your office, open it up and turn it into an outgoing call centre. We'll put operators at all your tables. I'll send 20 people over in half an hour." We didn't even ask the organization if we could do it. If you're going to be a general, you give orders. "Go over and do this, we'll send 20 people over and we'll send runners across with messages with stuff we want to go out. And we will alert particular individuals, the police, the fire department, the city hall, that they can call into there and you will get messages to us." Actually it worked out fine. They were thrilled to be able to help. We also used their kitchen, that's where most of the food was prepared. It was a seniors citizens centre, so it was ideally suited. Then, when the telephone company came in about ten o'clock, when they arrive, and looked at our lines to get us some more lines in they said "You don't have any more lines". They stripped lines out of all the offices in the buildings around us and ran them down the street and just brought us in extra phones. They just stripped them out of other buildings. Said "We'll get you lines". It worked well because Monday was a holiday, it was a long weekend to play with. And by that time they were able to get us [eight] extra circuits, and all that stuff. But on Friday night, within an hour, those guys were incredible, they said "You want lines, we'll get you lines". That's what happens in a disaster. (Tyre 1994: Interview)

2) Off-the-street volunteers converged on the Edmonton Red Cross Branch. People stood in line for hours in the pouring rain to volunteer their services. Over 1300 people were registered.

I went out about eleven o'clock [Friday night], there's this desk and people are registering one at a time there was a line up of people up the steps. And that line up, in the pouring rain, eleven o'clock at night, was down the block, and a block down the other way. And when those people got through the door, they had been standing in the rain for two

to three hours waiting to get in and register to be a volunteer for Red Cross. That's more than heartwarming, that's absolutely mind blowing. They just wanted to work and they knew where to come. And there was no question.... I couldn't believe it. What were all these people doing? "We're waiting to register as volunteers.". People had been standing in the rain all that time waiting to come in and work. (Tyre 1994: Interview)

Another thing that we had, because Red Cross is a volunteer organization, we have some degree of expertise in handling volunteer management. So consequently, when we had volunteers show up offering their assistance, it was not a big problem putting those people to work. It was raining cats and dogs at that time and these people were very patiently waiting outside. (Vanstone 1994: Interview)

Those volunteers who were put to work all experienced on-the-job training. Shifts would overlap by half an hour so that the new volunteer could gain some experience from the volunteer going off shift.

On the day of the tornado, the City requested that the Red Cross provide R&I at the designated reception centre, a high school. The reception centre was empty of clients because most had already been accommodated in hotels by the Red Cross.

In the case of the Edmonton tornado, the City decided it would open a reception centre in a... high school. And the fact is, nobody went there. Because it was well out of the way from the bulk of the problem. And so the people, themselves, kind of made their own way to a hotel on the north end of town. And in effect, we [the Red Cross] opened that hotel as a Reception Centre. So, rather than the City doing it, Red Cross kind of established it, got it going. (Vanstone 1994: Interview)

The Red Cross dispatched R&I teams to the hotels to register those who were displaced by the tornado. This registration took place "around the clock" until 2300 hours Saturday 01 August, by which time those located were registered and temporarily sheltered.

Mobile registration. Because, quite frankly, there were a number of people who didn't bother showing up. They made their own arrangements at other hotels and motels and things like that. So we sent people out just with their own cars, in pairs, to go around and just try to round up people who hadn't come to the reception centre. So that was another function of trying to get all the registration of the evacuees. (Vanstone 1994: Interview)

Registration and Inquiry continued. A Central Registry (a filing depot) was established at Red Cross House. By the Saturday, amateur radio operators were set up at the branch and relaying inquiries from cities across Canada.

We did not have a computer programme, we made one up to meet our particular needs, we have one now in all the Branch offices in Canada. At that particular time we did not have an R&I programme. We were using a manual system for the first few days and quickly realized that with a little bit of time being taken in terms of setting up a basic programme we could handle information much more quickly by computerizing the records. We were able to accommodate a lot of things in terms of lists that would go to the police department, the coroners department, the various hospitals, we became very..., as soon as word got out that Red Cross had this ability, our phone was ringing off the hook because no one else in the organization of the Edmonton Tornado had the complete list like the Red Cross did. Everyone looked to us including the City of Edmonton and the city police and so on. (Cook 1994: Interview)

From Monday 03 August to Monday 10 August, the Red Cross provided R&I and other assistance, at the request of other agencies, at the Victims Assistance Centre set up by the City at a high school. This resembled a clearing house, a "one-stop-shopping" affair where all assistance services were available under one roof. An additional 842 families were registered with the Red Cross at the centre.

What they [Social Services] were proposing was a one-stop-shopping centre, and Red Cross's role in that thing was, literally no one got past us until we had registered them. So, you couldn't even get into the centre until we had checked your name against registration so that we could pick up people we couldn't find. (Tyre 1994: Interview)

As a case in point, the City opened something along the lines of one-stop-shopping, where the victims could go to one place and meeting everyone they needed to from insurance companies to welfare agencies, things like that. And the day that place opened, they forgot to make arrangements to feed people. So, they came to us and asked if we could provide meals for 400, and we said "sure". But as I say, we had the resources, so it wasn't a scary situation (Vanstone 1994: Interview)

At the end of operations, the Edmonton Red Cross staff and volunteers were offered four volunteer debriefing sessions conducted by Alberta Mental Health workers.

The Edmonton Red Cross Branch was aided in the R&I process by the Red Cross Alberta - NWT Division office in Calgary. Until external phone lines were available for calls coming in to Edmonton, the Calgary office fielded inquiry calls. The Division Commissioner came home from his holidays to aid in the disaster response:

When I came back to Division, I got back in 8 hours, and spent the first 2 days setting up phone lines because the phone lines in Edmonton were down, and we set up the phone and tracing programme here. And then I went to Edmonton after we set up here. We didn't even have a fax machine then, so we got fax machines right away and set them up here, so when the phones were jammed we could fax things right away which worked out well. Our phone lines here were fine, they were operational in a few hours, nor did we have the ham operators. We did that within hours too... we had to scramble for who to call. (Stewart 1994: Interview)

In addition to organizing the Calgary response, Commissioner Keith Stewart established and helped administer the assistance fund. This fund assessed claims from thousands of people in the Edmonton community.

... we raised about 2.5 million dollars, that wasn't a problem.... I think setting up the one committee that looked after the clients. If it had been Edmonton Social Service, and the government social service, the Red Cross and the Salvation Army, and then there were a whole bunch of other smaller agencies, the people would have been bounced around all over the place. They had one access point, being the Edmonton Tornado Advisory Committee, to try and get information. Whether that information was on insurance claims, the government had put a member on our committee that was the head of disaster and safety services which gave grants also for rebuilding of homes. They knew the insurance angle and all that very well, so they took care of that side. They had sort of like one-stop-shopping, they could go and get their questions answered by us. And we would be the referral agency on record that would help the client get further information that they required. By having these people on the committee, because of the different sources [of funds], we were ensured that people weren't going to our fund for assistance, and also the government fund for disaster, and also the city's fund.... We weren't paying out claims twice or three times, so that worked out well.

Communications were good because they were done by us, the Tornado Committee, the public were informed. We had press releases out all the time, we put ads in the newspapers. We did newspaper ads that showed what they were eligible for under our funding criteria,... and they had a long deadline to reply, like a month or six weeks, and if they hadn't applied, then to apply. They would be reviewed, we reviewed every single application we got, we hired a lawyer which was critical. I hired her when I was in Edmonton setting up the disaster committee, she reviewed all the claims, and the criteria. (Stewart 1994: Interview)

Once all relief claims were reviewed, fifty three claims qualified for payment. The final claims were paid out in the autumn of 1994, seven years after the tornado (Stewart 1994).

The Red Cross emergency response activities were intensive for an eleven day period immediately after the occurrence of the tornado. The Edmonton Branch conducted R&I functions, provided food and emergency shelter to those in need. The commitment of the Red Cross in the Alberta - NWT Division to the victims of the Edmonton Tornado did not end with the closing of the emergency response field operations in August of 1987. It continued through the activities of the Tornado Advisory Committee for the following seven years.

4.5 Conclusion

Chapter Four has provided a general overview of the composition of tornado storms as a background for the discussion of the two case studies. The tornado disasters which occurred at Barrie, Ontario and Edmonton, Alberta have been described. For both case studies, an examination of the level of emergency preparedness of each local Red Cross branch has provided a basis from which to examine the emergency services operations of the two branch offices. Chapter Five will assess and contrast the emergency services activities of the Barrie and Edmonton Red Cross operations in relation to the Emergent Resource Coordination Model as was developed in Chapter Three.

Chapter Five

Two Case Study Analyses

5.0 Introduction

In narrative form, Chapter Four described the general preparation, as well as the specific activities of the two respective area Red Cross branch offices for the 1985 and 1987 tornadoes. This chapter will analyze and compare the emergency services operations of the Barrie and Edmonton Red Cross branches in accordance with the Emergent Resource Coordination Model.

As was discussed in Chapter Two, there are several principles of planning and preparation required to achieve the end result of a successful emergency response. Quarantelli (1987), as cited in Chapter Three, advocates that an emergency response should be organized in a manner so that the roles and activities of an organization are malleable. Complying with this tenet allows the responders to adapt to specific situations as they arise: the response roles are not rigid or constrained. Such rigidity may hinder the organization's ability to respond in the most effective manner possible.

5.1 Emergent Resource Coordination Model Analysis

The emergency response operations of the Barrie and Edmonton Red Cross branch offices, as presented in Chapter Four, are analyzed below with respect to the six points of the Emergent Resource Coordination Model. Both Red Cross responses met the objectives demanded by the respective emergency situations, although the Barrie Red Cross was more prepared to respond to a disaster situation of this scale.

Overall, the Barrie Red Cross emergency response was successful in providing the required emergency support services during the Barrie tornado disaster and it was effective in terms of fulfilling the criteria of the Emergent Resource Coordination Model. The Red Cross emergency response team was well organized and had the benefit of emergency response experience. The Edmonton Red Cross response to the tornado

disaster was ad hoc. Although the Edmonton Branch office responded effectively both in reality and according to the Emergent Resource Coordination Model, if the branch had been previously prepared and trained to handle a large scale emergency of this sort, the response might have been more efficient and effective.

1. Efficient mobilization of personnel and resources

1985 Tornado Response

The Barrie Red Cross mobilization was swift and efficient. At the request of the Barrie Fire Chief, the Red Cross was mobilized by 5:00 p.m., within an hour of the tornado. Four reception sites were opened to provide R&I services, although all the sites were utilized to their full potential because of their geographical locations to the disaster site. Later in the response period, the Red Cross arranged to borrow vehicles from other Red Cross branch offices to perform mobile feeding operations in support of the volunteers from the Mennonite Disaster Services who came to Barrie to aid in clean-up operations.

Prior disaster response experience enabled the Barrie Red Cross to mobilize efficiently in 1985. The Barrie emergency response team was established in 1979. The ensuing six years prior to the tornado were used to plan, train personnel and gain hands-on experience in responding to a variety of emergencies. In short, the Barrie Red Cross had the personnel base, equipment and knowledge required, should an emergency arise. For example: the Red Cross made regular appearances at house fires, distributed food and sheltered travellers waylaid by snowstorms. Perhaps their most demanding emergency, prior to the tornado, was a mobile feeding operation. In 1981, a train derailment in a neighbouring community, required the support of the Barrie Branch to feed the firefighters for a period of ten days.

The Barrie Red Cross had a formal emergency plan (South Simcoe Area Branch

1984: 1-15), which was produced in 1984, in which roles and responsibilities for leading a disaster response, R&I, transportation, communications, reception centres and public relations are clearly described¹. A detailed list of school facilities is included and material requirements for reception centres are listed. Additionally, plans for the distribution of food and clothing are outlined.

The combination of advance preparation, planning and experience resulted in the ability of the Barrie Red Cross to mobilize personnel and resources in an effective response to the tornado disaster.

1987 Tornado Response

As was stated earlier, the Edmonton Red Cross response was on an ad hoc basis. Despite this being the case, however, in Edmonton the response to the emergency was also initiated within an hour of the tornado striking, by 4:00 p.m.. Although the Red Cross did not have a trained personnel base for the response and only received preliminary supplies for R&I on the day of the event, the Edmonton Branch did, however, have the knowledge to deal with an influx of "off-the-street" - or irregular - volunteers. As a result, the Edmonton Red Cross was able to employ these irregular volunteers in positions that would have been filled by emergency response team members *if such a team had existed*.

During the 1987 tornado emergency, supplies and resources were acquired as required, with the exception of the R&I cards which were obtained - entirely fortuitously - on the morning of the tornado. Examples of the acquisition of resources as the need arose, include: "usurping" office space in a neighbouring building to set up telephone and kitchen facilities, telephone lines were borrowed from other office buildings and food supplies were donated by corporations and the public.

¹ A copy of the Red Cross South Simcoe Area Branch emergency plan is available from the researcher or her supervisors.

The Edmonton Branch did not have an emergency plan. Emergency response experience had been limited to responding to house fires, therefore, the Edmonton Red Cross was not prepared by training or previous experience to respond to a large scale disaster. In terms of pre-disaster response planning, the mobilization of personnel and resources on the part of the Edmonton Red Cross was inadequate. Conversely, considering the personnel supply, as well as the resources on hand, the Edmonton Red Cross mobilization was effective and executed in a competent manner.

ii. Timely communication of information within and between local clusters of organizations

1985 Tornado Response

There is little information available on the organization of the internal communications of the Barrie Red Cross Branch. Within the emergency plan, there is no call for a formal meeting process to discuss the day's events or consider organizational planning. The plan advocates that all information be filtered through the emergency services chair. Throughout the plan, activity leaders are encouraged to familiarize their workers with their roles and responsibilities but no structured meeting process is mentioned. No meeting process was indicated in the Barrie Red Cross final report or the interviews conducted for this study. The only firm indication of an intra-organizational communications link occurs in the division of the chair's role. A primary emergency services chair, which deals with the overall organization of the response, is located at the branch office headquarters. A co-chair is situated in the "field", in order to assess the on-site disaster situation and report back to the chair. While this division of title is stated in the emergency plan (1984: 7), the actual role-divisions of these two positions are not delineated. However, I have evidence that this role-division did take place in the Barrie tornado response, as the former emergency services chair has stated:

..., my job was coordinating the services required. I had a team of Registration and Inquiry, that was the big thing. Then, developed out of this, by me, was an outside co-chairman, if you like. A field person. When you were in the branch doing your thing, this person was out seeing a) that it was done, and b) what had to be done, and c) making recommendations to change. Very important, because you can't be everywhere. (Skelding 1994)

On an external level, there is strong evidence of the Barrie Red Cross having communicated with other organizations. The first indication is the initiation of the emergency response. The Red Cross response was activated by the chairman but at the request of the Barrie Fire Chief in accordance with the City's emergency plan.

Throughout response operations, the Red Cross was constantly in contact with other organizations:

- 1) After one of the reception centre sites was inundated with donations the Red Cross arranged with other volunteer organizations to have these goods distributed,
- 2) cooperation with the local amateur radio group was evident through this group's support and interaction with the Red Cross, and
- 3) a relationship was developed with the City's Social Services department to provide temporary shelter. This relationship later expanded to include the provision of emergency funds:

[The Director of the City's Social Services] tipped me off. There started to be a lot of people double dipping [, requesting emergency funding from more than one organization for the same resources]. So what happened, we worked out a nifty scheme. If Mr. Jones went to the social services in the City, and they gave him something, [they] would call me at the Branch and say that they just had Mr Jones in from whatever address. So we had a listing. And if Mr Smith came into us and we gave him something, I'd call [Social Services] and say Mr Smith was here and we gave him whatever. So, it took about a day to work that one out. Because initially you're too busy to get the stuff done to realize that could happen. Anyway, [the Director of the City's Social Services] tipped me off, so we got that one worked out really good. (Skelding 1994)

In neither the Red Cross emergency plan nor in the interviews conducted for this study is there any mention of a Red Cross representative regularly meeting with the Emergency Operations Centre, the control group for the disaster which was made up of

representatives of organizations involved in the response; neither is there any mention of a designated liaison between these groups.

Therefore, those communications that occurred within the Red Cross branch, as well as with external organizations were efficient and timely when they did, in fact, take place.

1987 Tornado Response

The Edmonton Red Cross was not part of the City's emergency plan, therefore, Red Cross responders had to work undirected in the first hours after the tornado disaster, often unknowingly taking-on roles allocated to other organizations. Not being part of the City's emergency plan also resulted in the initial communications between the Red Cross and other responding organizations being limited.

Once additional telephone lines were either accessed or borrowed from surrounding office buildings, city officials were contacted and notified of phone lines which were dedicated to the Red Cross. This action served to better incorporate the Edmonton Red Cross into the overall response operations, enabling them to work with the other agencies until the close of response operations. There is no mention in either the reports or in the interviews conducted for this study, of a formal meeting process between the Edmonton Red Cross and other emergency response agencies.

From the perspective of communications, the actions of the Red Cross responders were effective: dedicated means of communication were established for the use of communicating with other organizations. The absence of knowledge of dedicated roles in the City emergency plan, however, resulted in the Red Cross responders duplicating response activities which were assigned, in the City emergency plan, to other organizations.

iii. Timely communication with the public

1985 Tornado Response

Timely communication with the public on the part of the Barrie Red Cross is difficult to assess. There is no evidence, either in the Barrie Red Cross final report or the interviews conducted for this study, that the existence of the reception centres was immediately communicated to the public. This may explain, in part, why the attendance level at the reception centres was low. The majority of displaced persons were accommodated by friends and relatives prior to their registration with the Red Cross and the local news media had to "advertise" the need for residents affected by the disaster to register with the Red Cross in the days following the tornado (The Examiner, Monday 2 June 1985: 1). The purpose of registration was to provide information for relations and friends who did not reside in the affected area, or who were out of town at the time, but were concerned about the individuals they knew, who were affected by the disaster.

There was no mention in the Barrie Red Cross final report or the research interviews of any press conferences or media briefings. Although numerous local newspaper articles stated the Red Cross was involved in the emergency response efforts - and reported on the Red Cross activities - I believe this activity was initiated by the news media and not the Red Cross. There is no evidence that the Barrie Red Cross actively sought on-going communication with the public during the disaster. The only example to the contrary occurred when the Barrie Branch strove to correct an unasked for, media generated plea for donations of food, clothing and furniture - to be delivered to the Red Cross - immediately after the tornado.

From the data I have gathered, the only mention of disaster victim referrals to the Red Cross from an external organization was in the discussion about the distribution of

emergency funds. I cannot comment on information which may have been generated by other organizations concerning the Red Cross because there is no data available on this issue.

Based on the available evidence, it is my opinion that the Barrie Red Cross lacked sufficient communication with the public, especially in a timely manner. This aspect of the emergency response was less than efficient, effective, or successful.

1987 Tornado Response

Conversely, the Edmonton Red Cross did communicate in a timely way with the public. At the beginning of the Red Cross response, the media were contacted and given permission to broadcast the Red Cross House telephone number as an information line and for the purposes of R&I. However, due to the Edmonton Red Cross having had no previous experience in responding to large scale disasters, this act caused a flood of telephone calls to the branch which resulted in a complete jamming of all the telephone lines. Not only did people call the Red Cross to request [R&I] information, members of the public called to inform the Red Cross of the locations of groups of people who were displaced by the tornado. Once this secondary information about displaced residents was acquired, the Red Cross was able to mobilize R&I teams to go to these sites and extend the registration process.

To my knowledge, no press conferences were held by the Edmonton Red Cross. However, the divisional office produced several press releases on the tornado situation in Edmonton. At a later date, press releases were also issued on the status of the relief fund.

Barring planning and logistical problems - in that the branch had no emergency plan or plentiful resources - the Edmonton Red Cross made a concerted effort to communicate with the public and to offer assistance where needed.

iv. Resolution of conflicts over goals, tactics, and resources

1985 Tornado Response

The Barrie Red Cross was successful in the resolution of conflicts when they arose, although there is little evidence in the final report or the research interviews to indicate that any major conflicts occurred during the emergency response. In fact, only two incidents arose where immediate conflict resolution was required. The foremost example of the Barrie Red Cross Branch's capable handling of conflict resolution occurred when unsolicited donations of food, clothing and furniture began to converge at a reception centre site on the first day of the disaster. The Red Cross quickly contacted other organizations more suited for the distribution of these goods to handle the influx of donations. The second example occurred when the City was reluctant to support the Mennonite Disaster Services volunteers by feeding them during their ten day stay in Barrie; although the exact reason for this is unknown I suspect that it stemmed from financial concerns. The Red Cross arranged for the preparation and provision of food for these volunteers. Hence, where conflicts were noted, they were handled quickly and efficiently by the Red Cross.

1987 Tornado Response

The Edmonton Red Cross Branch successfully resolved conflicts which arose over goals, tactics and resources. Being without a body of trained personnel and a ready store of resources, the Edmonton Red Cross successfully employed irregular volunteers in the response process, providing them with on-the-job training. Communication problems were resolved by utilizing telephones in - and from - other office buildings. Furthermore, a mobile R&I service was established to find and register dispersed groups of displaced persons. It would be logical to assume that more

conflicts should have arisen due to the lack of planning on the part of the Edmonton Red Cross. I attribute this accomplishment to the firm leadership of the Red Cross staff and the former Branch President, with his "civil" experience in disaster management and to the ability of the Red Cross staff and volunteers to adapt quickly to a pressing situation.

v. Effective interaction with regional and national [parent] agency units when needed (emphasis added).

1985 Tornado Response

The Barrie Red Cross emergency plan notes that the branch is to keep the divisional office informed on a regular basis (1984: 6) during a disaster response. Although this is the procedure in theory, in Barrie it did not occur. There is only one situation report produced by divisional office on 5 June 1985 reporting on the emergency response in Barrie (Ontario Division: 1985). The only other mention of contact with the divisional office was in the Barrie Red Cross final report in reference to the loan of vehicles from the neighbouring Red Cross branch offices to facilitate mobile feeding operations.

Likewise, I located only one situation report sent from the National Red Cross office to the League of Red Cross and Red Crescent Societies, in Geneva, Switzerland, detailing the tornado situation in Barrie (The Canadian Red Cross Society, National: 1985).

Where there was a good interaction between the Barrie and other Red Cross branch offices was with reference to R&I activities. As stated in Chapter Four, the Metro Toronto office fielded telephone calls for the Barrie Red Cross. Additionally, the Barrie Red Cross handled R&I for the surrounding communities of Grand Valley and Tottenham via amateur radio operators (Skelding 1985: 7).

I would suggest that in view of the situation reports, the vertical flow of

information concerning the Barrie tornado was less than acceptable, per the Emergent Coordination Model. In relation to R&I, however, I believe that the information flow was up to par.

1987 Tornado Response

The Edmonton Red Cross Branch kept in constant contact with both the divisional and national offices. Regular situation reports were telefaxed to the national office in the first days following the tornado disaster. The divisional office was kept informed by amateur radio of the Red Cross activities taking place in Edmonton. The Commissioner of the Division also spent some time in Edmonton reviewing the branch operations. Likewise, the divisional office provided back-up R&I services for Edmonton. There was no lack of communication within the Red Cross organizational structure with regard to the tornado disaster response.

vi. Effective exercise of authority when needed

1985 Tornado Response

The Barrie Red Cross effectively exercised authority in response operations. The Red Cross already had designated - and was later assigned further - functions to perform; the responders performed them effectively. The responders worked well in conjunction with other organizations and did not overstep their operational boundaries. Where authority over a certain area of responsibility was uncertain, the Red Cross cooperated with the other organizations involved to alleviate the conflict.

1987 Tornado Response

Since the Edmonton Red Cross did not have an emergency plan, the "effective exercise of authority" guided the entire emergency response. There were three main

decision makers in the Red Cross response: the Branch President, the Branch Director and the Emergency Services Chairman. The two former individuals guided the operations from a command centre, in the Director's office, in Red Cross House, while the latter took charge of field operations. Lacking an internal plan and clear direction from the City, in terms of the City's plan, Red Cross personnel did what they felt needed to be done at the time of conducting their response. Although this caused some overlap with the operations of other organizations, it also enabled the Edmonton Red Cross to respond effectively to the tornado disaster.

1985 Tornado Response

With the exception of the lack of communications with the public and between the branch and the divisional and national offices of the Red Cross, the Barrie Red Cross Branch performed efficiently and effectively in the emergency response to the Barrie tornado disaster. Previous experience training and involvement in the emergency planning process, both internal to the Red Cross and externally with other organizations, aided the Barrie Red Cross in the emergency response operations of the tornado disaster.

1987 Tornado Response

Overall, the Edmonton Red Cross Branch response to the tornado disaster was successful, despite having to overcome several shortcomings. Red Cross personnel worked with the staff, volunteers and resources available to them, with little direction or clear focus as to the role they were to play. The absence of a branch emergency plan and lack of communication, in terms of pre-planning with the City and other emergency response organizations, hampered Red Cross operations due to having a lack of a trained personnel base, as well as a store of resources required for the response. The

Edmonton Red Cross also had to deal with no definite direction or definition of their exact role in the overall emergency response. The ability - or lack thereof - of controlling the influx of telephone calls to Red Cross House was also a difficulty that had to be dealt with.

On the whole, the Barrie and Edmonton Red Cross branch offices both successfully responded to the respective tornado disasters, according to the Emergent Resource Coordination Model. Several weaknesses in the response operations were identified in the independent analyses. Table "2", summarizes the results of these analyses:

Table # 2 Emergency Response Analyses Summary		
Emergent Resource Coordination Model Point of Analysis	Barrie, Ontario	Edmonton, Alberta
	Emergency Response Analysis	
• Efficient Mobilization	Successful	Partially Successful
• Communication with other Organizations	Successful	Partially Successful
• Communication with the Public	Unsuccessful	Partially Successful
• Resolution of Conflicts	Successful	Successful
• Intraorganizational Communication	Partially Successful	Successful
• Effective Exercise of Authority	Successful	Successful

The following section provides a comparative analysis of the two tornado disaster response operations.

5.2 Comparative Analysis

The differences between the emergency response operations of the two branches can be categorized into four areas. First, where the Barrie Red Cross had a well established emergency services programme, with experience in providing support in

both minor and major emergencies, the Edmonton Red Cross had an emergency services programme consisting of one person, the chairman. Although the Edmonton Red Cross did have experience in responding to house fires, the branch had not responded to a large scale emergency prior to the tornado disaster.

Second, the Barrie Red Cross had a trained and organized volunteer base from which to initiate emergency response operations. The Edmonton Red Cross had to rely on branch staff, volunteers from other programmes and off-the-street volunteers for their personnel base. For the most part, the Edmonton Branch had few people trained in emergency services, therefore, most of the responders learned while on the job.

Third, the Barrie Branch had an emergency plan that outlined the roles and responsibilities of the Red Cross in case of a large scale emergency. The Barrie Red Cross was also in contact with City officials and had certain responsibilities which were designated in the City's plan. The Edmonton Branch did not have an emergency plan, as the emergency services committee was only established a month prior to the tornado disaster. The Edmonton Red Cross was in contact with government emergency services providers but mainly on an informational basis. The Edmonton Branch was not designated a role in the City's plan nor involved in the City's planning process as a result. Therefore, the Edmonton Branch was at a disadvantage in its response operations, in terms of knowledge of other organizations' activities and designated roles.

Fourth, although there is no direct evidence of this in the research data, the geographical size of each city may have affected the planning process. In a smaller urban centre such as Barrie, there is a tendency for community leaders to know each other or to at least know of each other. As such, it is easier to establish a centralized planning structure. In a larger urban centre, the size of Edmonton, several layers of government exist: different offices deal with the provision of emergency services and

the emergency services community is decentralized. This decentralization tends to inhibit a multi-organizational planning structure.

To risk oversimplifying, in the former situation, one knows one's neighbour, in the latter, one does not. The situation in a smaller centre can inspire an overconfidence, as exemplified with the Barrie Red Cross failure to communicate promptly with the public, as well as with Red Cross divisional and national offices. In a larger urban setting, a situation of forced independence can arise. The Edmonton Red Cross was unaware that it was duplicating services designated for other organizations.

There is little evidence to suggest that after the Barrie Tornado, information was disseminated to other Red Cross branches in Canada concerning the emergency services response process. This is not to say that other Red Cross offices in Canada were not aware of the Barrie Red Cross emergency response activities. But as a result, the Edmonton Red Cross did not have a "guideline" - or the knowledge of another branch's learned experience - from which to conduct the 1987 tornado emergency response. In this case, both Red Cross offices conducted their response operations independent of prior, external Red Cross emergency response experience.

Both, the Edmonton and Barrie Red Cross branch offices, exhibited strengths and weaknesses in their emergency response operations to the respective tornadoes. Although different in structure, planning, personnel and resources available, both responses were effective and responded to the crisis at hand.

5.3 Conclusion

This chapter has provided two analyses on both: the individual and comparative levels of the emergency response operations of the Barrie and Edmonton Red Cross branch offices in the respective tornado disasters.

Chapter Six

Conclusion

6.0 Study Conclusions

Overall, the emergency response operations of the Barrie and Edmonton Red Cross branch offices were successful in assisting in the mitigation of the respective tornado disasters. Both branches fulfilled their primary functions with respect to R&I, in addition to several auxiliary activities. Through their actions, Red Cross workers played a vital role in enabling the communities to reorganize: they re-established links between family and friends through R&I services, they arranged for temporary shelter for persons displaced by the tornadoes, the Red Cross provided food for the displaced persons as well as volunteers working during the response and they provided funding assistance to families affected by the tornadoes through emergency and long-term assistance programmes.

Although the outcomes of both response operations were successful, according to the Emergent Resource Coordination Model and within the context of this research, I suggest that the Barrie Tornado response was the more successful of the two. The Barrie Branch was fully prepared to respond to a large scale disaster. The branch emergency services committee was well organized and trained. From the inception of the emergency services committee in 1979, the Barrie Red Cross emergency response team had provided emergency social services in several small scale emergencies and in a major train derailment disaster. The branch had a well developed emergency plan, established contacts in the emergency services community in the Barrie area, as well as a designated role in the City's emergency plan. The Barrie Red Cross response was not as effective, however, in the area of communications. The public was not as well informed as it could have been in the hours after the tornado. The Barrie Red Cross could have also been more vigilant in communicating with the divisional and national offices of

The Canadian Red Cross Society.

Conversely, the emergency response operations of the Edmonton Red Cross Branch were hampered by the absence of previous planning and training. When the tornado occurred, the Edmonton Red Cross was in the process of establishing an emergency services committee and defining the role the Red Cross would play in a disaster. Until the tornado struck in 1987, the Red Cross personnel had no emergency experience except for providing support services for house fires. The Edmonton Red Cross did have some advantages, however, which assisted their tornado response: the branch president, at the time, had external experience in emergency management, branch personnel had experience in volunteer management and the Edmonton Red Cross had the welcome aid of over 1000 off-the-street volunteers to supplement regular Red Cross volunteers and staff in the emergency response activities. The Edmonton Red Cross was disadvantaged in training, planning and communications with other members of the emergency services community prior to the disaster. However, the Edmonton Branch had the advantage of strong and innovative leadership being present and available during the tornado disaster response.

Since the tornadoes of 1985 and 1987, the Barrie and Edmonton Red Cross branch offices have undergone changes in their respective emergency services programmes. At the time of this data being collected, which was nine years after the Barrie Tornado, the Barrie Red Cross no longer had a fully active emergency services programme. When the (volunteer based) board of directors resigned in 1987, the emergency services response team was one of the programmes left without leadership or support. When I was in Barrie in July 1994, the emergency services programme had only two dedicated volunteers.

The Edmonton Tornado precipitated a different reaction from the Red Cross. As a direct result of the tornado, the Edmonton Red Cross developed a comprehensive

emergency services plan which became the model for branch offices in the Alberta - NWT Division of the Red Cross.

Although Red Cross emergency services programmes and provisions are not yet (in 1995) standardized across Canada, Emergency Services is considered one of the five primary programmes requiring branch attention. Currently, the National office of The Canadian Red Cross Society is developing standardized training modules, in text form, for use across the country.

6.1 Recommendations

I propose two recommendations for future actions and research of the emergency services programmes of The Canadian Red Cross Society, as well as a further recommendation for subsequent research in this field. First, I recommend that a standard be set for the keeping of detailed records of Red Cross emergency response operations. Accurate and complete information should be stored in at least two locations: the branch office of the response in question and in the National Red Cross archives. This information is critical for purposes of legal liability, research and for the simple purpose of keeping a record of events. Since emergency preparedness planning and management is a continuous process, records further the learning and planning processes. Without recourse to archived information the learning process is stalemated: not growing beyond the present needs and the present situations. To advance this process one must learn from the past. This recommendation arises from the great difficulty I had locating complete primary documentation for this research.

Second, I suggest that the development of a standardized Red Cross emergency services programme in Canada be monitored through the research of planning, training and emergency response operations of branch offices. Since each branch office is unique unto the community in which it is located, the functioning of each branch office is dependent upon a volunteer base drawn from that community. Each community is also

subject to hazards unique to its location, which would be reflected in the different planning, training and emergency response activities particular to each community, regardless of standardization. Therefore, I advocate the promotion of continued research and evaluation of Red Cross emergency services programmes as they develop.

Finally, I suggest that through furthered research into the response operations, not only of the Red Cross but other agencies as well, a more comprehensive yet flexible method of analysis be developed. In this study, I have found that the value of the Emergent Resource Coordination Model, as outlined in the initial six points established by Kreps, which is presented in Chapter Three, is insufficient as a workable model for the evaluation of emergency response operations. These points so provide a very basic framework, but all require considerable amplification. Alone, these six points provide very general benchmarks for evaluating a response operation without specifically delineating the process necessary to achieve these points. Although Kreps' model offers a very broad basis from which to assess the performance of an emergency response, the generalities of the model leave an assessor without proper direction as to how to proceed. At the very least, an assessment model should provide examples of the type of information and activities one is looking to assess. Is it well enough to ask: "Have we communicated timely with the general public - those whom we are here to help?" without outlining what that statement really means? Of course, this may mean something different for each response agency, yet, there will be similar needs and requirements for every response organization. These should be identified and provided as a base from which individual assessment mechanisms may be built upon.

This thesis has focused upon two case studies of the same type of disaster, responded to by two different branch offices of the same organization. Despite the commonality of disasters and organizational structures both responses were successful

in some areas and unsuccessful in others. Regardless of the commonalties, the areas of success, as well as failure, were completely different in both instances.

At first glance, the importance of this study to the field of hazards research in geography, with reference to the evaluation and effectiveness of disaster response operations, may not be obvious. Although this study provides analyses of two organizational responses to disasterous events, to realize its full import one must look beneath the surface analysis of the respective emergency responses. This research, as well as the difficulty I encountered in acquiring data to do this research, illustrates the necessity for the discipline of geography to broaden its scope to encompass a more human element in disaster research.

In these cases studies, the organizational responses to the disasters are significant to the human population in need. If the Barrie and Edmonton tornadoes did not affect the social fabric of the two cities, the lives of the inhabitants, and the built urban environments, there would have been no need for the Red Cross to respond; no need to mitigate the disasters. An emergency social services response to a disaster, therefore, is a consequence of need on the part of those affected by the event. The organizational responses cannot be taken out of context and viewed as isolated events: they are symptoms of the disasters. Therefore, the scale of the emergency response is in direct correlation with the damages to the urban units on the whole. Likewise, from a sociological perspective, there is a need for volunteer organizations to define a place in the structure of society. Therefore, the Red Cross needs disaster to seem to be happening to legitimate its existence.

Employing this study of two very human emergency responses to tornadoes, however, is relevant to natural disaster studies. By its very definition, a tornado is not a tornado unless reported by a human being to another human being. Therefore, the actual processes of a tornado (high winds, etcetera) are going to have a negative impact

on at least one human being - or number of human beings - depending upon circumstances. It goes without saying, this disastrous event will have negative ramifications. A tornado, therefore, is the perfect natural disaster that can be incorporated as a transitional model to broaden the discipline of geographic studies of hazards to encompass a more human focus.

There is no master plan that will provide for a "picture perfect" emergency response for each and every situation which may arise because each disaster will manifest itself differently. Each situation, even if the cause is the same, is unique unto itself, as has been proven in this research. Accordingly, there are only 'best guesses'.

Some sort of response is better than none at all; it is preferable for the emergency responders to have some foreknowledge of what they will be confronting. A haphazard, ill planned response could aggravate, if not worsen, an already calamitous situation.

By their very natures, risks, hazards and disasters are dependent upon there being a population, or something of importance, to which these events pose a risk. As the population of the world increases and more sophisticated technologies are employed in everyday life, there are more potential for risks, in a greater number of areas of society. For this reason, geographers must devote more effort to studying not only the underlying causes of these hazards but the variety of methods used in mitigating disaster situations so as to keep pace with a changing world. Not only should the changes in society be studied but their safeguards as well.

Likewise, these societal changes should not be seen as one sided. For practical uses, on a macro scale, there is a need for a greater variety of cross-cultural research in to how hazardous situations are dealt with, since each response is situation specific. On a micro scale, there is a lack of research on how, on an individual level, people deal with daily emergency situations and hazards. The results of research on areas of disaster studies such as these can add to the existing knowledge base and aid emergency

response agencies in preparing for, as well as implementing their response operations. Furthermore, a higher visibility of research in disaster studies may inspire better programmes for public education and help minimize potential risks in society at large.

Risks are out there.

INQUIRY CARD — DEMANDE DE RENSEIGNEMENTS
PLEASE PRINT — EN LETTRES MOULÉES S.V.P.

NO 749501

LIST ONLY PERSONS WITH THE SAME FAMILY NAME AND ADDRESS. FILL OUT SEPARATE CARDS FOR OTHER PERSONS.
INSCRIRE SEULEMENT LES PERSONNES AYANT LE MÊME NOM DE FAMILLE ET ADRESSE. REMPLIR UNE CARTE DISTINCTE POUR TOUTE AUTRE PERSONNE.

1 FAMILY NAME OF PERSON(S) YOU ARE INQUIRING ABOUT
NOM DE FAMILLE DES PERSONNES RECHERCHÉES

2 FIRST NAME — PRÉNOM

3 INITIAL

4 SEX — SEXE

5 AGE — ÂGE

6 PERMANENT ADDRESS — ADRESSE PERMANENTE

7 TELEPHONE — TÉLÉPHONE

8 ADDITIONAL INFORMATION — AUTRES RENSEIGNEMENTS

9 PLACE OF INQUIRY — LIEU DE LA DEMANDE

10 DATE — DATE

11 TIME — HEURE

12 NAME OF PERSON MAKING THE INQUIRY — NOM DE LA PERSONNE (PERSONNEL)
13 FIRST NAME — PRÉNOM

14 RETURN ANSWER TO — ENVOYER RÉPONSE À
ADDRESS — ADRESSE

15 TELEPHONE — TÉLÉPHONE

16 REPLY — FOR OFFICE USE ONLY
RÉPONSE — À L'USAGE DU BUREAU SEULEMENT

17 CONDITION — ÉTAT

18 EMERGENCY ADDRESS AND TELEPHONE NUMBER — ADRESSE ET NUMÉRO (N) TÉLÉPHONE TEMPORAIRES

19 REMARKS — REMARQUES

20 ANSWER — RÉPONSE

21 SIGNATURE

MS 8111 (8-85)

Health and Welfare Canada
Medical Services Branch
Emergency Services

Santé et Bien-être du Canada
Direction générale des services médicaux
Services d'urgence

COPY 1 — PLACE OF INQUIRY
COPIE 1 — LIEU DE DEMANDE

COPY 2 — CENTRAL REGISTRY
COPIE 2 — FICHER CENTRAL

COPY 3 — CENTRAL REGISTRY
COPIE 3 — FICHER CENTRAL

REGISTRATION CARD — CARTE D'INSCRIPTION
PLEASE PRINT — EN LETTRES MOULÉES S.V.P.

NO 499751

1 FAMILY NAME — NOM DE FAMILLE

2 FIRST NAME — PRÉNOM

3 INITIAL

4 MIDDLE NAME — SURNOM

5 SEX — SEXE

6 AGE — ÂGE

7 CITY — VILLE

8 PROVINCE — PROVINCE

9 TELEPHONE — TÉLÉPHONE

10 EMERGENCY ADDRESS AND TELEPHONE NUMBER — ADRESSE ET NUMÉRO DE TÉLÉPHONE TEMPORAIRES
PLEASE INFORM CENTRAL REGISTRY BUREAU IF YOU MOVE
AVERTIR S.V.P. LE BUREAU DU FICHER CENTRAL SI VOUS VOUS DÉPLACEZ

11 SPECIAL MEDICAL NEEDS — BESOINS MÉDICAUX PARTICULIERS

12 ADDITIONAL INFORMATION — AUTRES RENSEIGNEMENTS

13 PLACE OF REGISTRATION — LIEU D'INSCRIPTION

14 DATE — DATE

15 TIME — HEURE

16 FOR OFFICE USE ONLY — À L'USAGE DU BUREAU SEULEMENT
22 CROSS REFERENCE — RENSEIGNEMENTS

MS 8111 (8-85)

Health and Welfare Canada
Medical Services Branch
Emergency Services

Santé et Bien-être du Canada
Direction générale des services médicaux
Services d'urgence

COPY 1 — PERSON REGISTERED
COPIE 1 — PERSONNE INSCRITE

COPY 2 — PLACE OF REGISTRATION
COPIE 2 — LIEU D'INSCRIPTION

COPY 3 — CENTRAL REGISTRY
COPIE 3 — FICHER CENTRAL

"From *Registration and Inquiry Manual*, Health Canada, 1986. Reproduced with permission of the Minister of Supply and Services Canada, 1995."

2 of/de 2

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

PRECISIONSM RESOLUTION TARGETS

Appendix B Ethics Proposal

Natalia Skapski
MA Student
Department of Geography
Supervisors: David Bennett, Geography
Charles Gordon, Sociology

RE: PROPOSAL FOR RESEARCH WITH HUMAN SUBJECTS; SECTION NO. 3,
PROCEDURES

PROJECT TITLE: An Examination of Selected Aspects of Disaster Recovery in Urban
Environments

The object of this research is to examine how urban communities are disrupted by disasters, and how non-government relief organizations enable the community recovery process (the recovery process being that time immediately following a disaster event in which external aid is provided to the disrupted community). For the purpose of this research, the activities of The Canadian Red Cross Society will be examined and assessed in the case studies of Barrie, Ontario tornado (1985) and the Edmonton, Alberta tornado (1987).

There will be a primary focus on how, and what, Red Cross activities enable processes of community reorganization after a disaster; and, how, or if, the lessons learned from one disaster are carried through into the recovery phase of another. Therefore, the bulk of the research will be conducted using the Barrie tornado data; once an assessment is made from this case study, the results will be compared to events of the Edmonton tornado.

Although disaster response is a function of The Canadian Red Cross Society, the Red Cross is not the primary response agency for disasters in Canada (this is the role of various government agencies); and, since large scale disasters, where a state of emergency is declared, in Canada are relatively few, this study will provide increased knowledge to disaster researchers and relief agencies. A final assessment of Red Cross activities in enabling community reorganization in these two disaster events will conclude this research.

SUBJECT DATA

Data will be collected in two different forms: primary documentation, and personal interview with key responders. That collected by interview will be used to supplement the documented data.

The bulk of the data to be employed in this research will be in the form of primary documentation already archived by the Red Cross. The data collected will concern information on both the disaster responders (Red Cross employees and volunteers) and the disaster 'clients' (those affected by the disaster). These data will be combined with interview data on the operations of the organization, as a whole, to produce an image of the organizational and urban communities as they were affected by the disasters, and to assess what actions were, or were not, taken by the Red Cross. These data will then provide the basis for assessment and comparison between disaster events.

Any personal data that may be able to identify individual responders or victims will be dealt with in an aggregated and generalized manner as not to identify any one person without their permission. For example, when presenting data on the number of families left homeless in a given neighbourhood, specific houses and families will not be identified (either graphically or by narrative) but the area itself will be discussed in general terms and using descriptive statistics: the path of the tornado travelled though "X" section of the city, destroying "X" number of homes, and leaving "X" number of families homeless. Graphically, the areas affected will be portrayed in general neighbourhood terms, no one house will be identified on a map, and only main thoroughfare will be identified (if necessary).

The data gathering will be done by the researcher (Natalia Skapski) for the Barrie tornado case study, and possibly for the Edmonton tornado case study (funds permitting; if funds are unavailable for field work in Edmonton, a data request will be submitted to the Red Cross asking for the relevant information to be sent to the researcher). Existing Red Cross files are identified by name and event. For all analysis done by the researcher, two separate files will be kept: a master file and a reference file.

The master file will hold all the pertinent document-generated data. Personal data collected on disaster 'clients' and 'responders' will be identified by a number-letter code, for example, R85B0001 or C87E0301: the "R" or "C" indicating responder or client; the "85" or "87" indicating the year of the event; the "B" or "E" indicating either Barrie or Edmonton; and, the "0001", "0301" and so on, indicating the file number attributed to an individual. These number-letter codes will identify all the data associated with a particular person before the data is aggregated for presentation purposes.

The reference file will cross reference the number-letter codes to individual names. This file will be kept strictly for cross checking data and if any follow-up or review is necessary. This will be a closed file, it will be kept in a sealed envelope, and only the researcher will have access to this information. Arrangements have been made for both the master and reference files to be held (in a locked file cabinet and office) by the local Red Cross office (The Ottawa-Carleton Branch of the Canadian Red Cross Society). Once the research for this thesis is complete, the reference file will be returned to the Red Cross archive from which the information was obtained.

Data will be aggregated using descriptive statistics for this does not represent a systematic sample in a statistical sense, and statistical inference would be limited.

Documentation Requested:

1. Red Cross Disaster Responders:

- 1.1 What is the responder's home address (city and province only)?
- 1.2 What is the responder's employment category (paid or volunteer)?
- 1.3 When did the responder arrive at the disaster site?
- 1.4 How long did the responder stay at the disaster site?
- 1.5 Where did the responder stay while at the disaster site (hotel, billet, barracks, and so on; site specific information only for institutionalized lodgings like barracks and hotels, but not for billet information that may identify another family)?
- 1.6 What function did the responder perform (job title)?
- 1.7 What were the locations of the work stations?

1.8 After the initial response trip, did the disaster responder return for a subsequent term?

2 Red Cross Disaster Clients:

2.1 Where are the home sites of the disaster-affected clients (neighbourhood area)?

2.2 Where were the clients sheltered relative to their home sites (numbers billeted, numbers in public shelters and location of public shelters, numbers in hotels; site specific information only concerns shelters, not hotels and billets)?

2.3 Were clients relocated to another urban area?

2.4 For how long were clients billeted (duration of stay)?

It is not the intent of this research to disclose personal identifying information of the responders or the 'clients'. The names of either the disaster responders or 'clients' will not be used without their expressed permission (see informed consent).

The interview selection process for Red Cross personnel will be based on the responder's role and activity in the disaster event, usually at the 'management level' for both employees and volunteers. These people will be identified from the document data analysis. Most interviews will be done in person. Where this is not possible, a copy of the interview questions will be sent to the interviewee and the interview will be conducted by phone at a convenient time to both parties.

There is a possibility of interviewing the 'clients' of these disasters as a "10 years after..." scenario, but I feel that this will require great tact and sensitivity, and I would rather take the cautious route and not do this at this point in time. If the research lends itself to this interview process, I will, at that time, submit supplemental interview and research method proposal to the Ethics Committee for review.

Appendix C Interview Questions

INTERVIEW FORMAT

Interview date:

1. Name:

2. Position:

3. Disaster situation:

4. Disaster recovery roll: Briefly describe your job during this event.

4.1 Were you prepared for this role (training and personal knowledge)?

4.2 Do you think that the Red Cross was adequately prepared to facilitate you in this role (materiel)?

4.3 How necessary was your job to the disaster recovery process?

5. By your actions, do you feel that you helped enable the community recovery process in this event? How/why?

6. Do you think that the Red Cross was prepared for its role in the response/recovery phase of the Barrie/Edmonton tornado?

6.1 How would you assess the activities of the Red Cross in this disaster?

6.2 What do you feel was the most outstanding accomplishment of the Red Cross in this event?

6.3 What do you feel could have been done to make the Red Cross response/recovery process run more smoothly?

6.4 Was the Red Cross in the position to do this (re 6.3)?

6.5 What do you feel the Red Cross did in this event that may not have been necessary to the response/recovery process (ie hindered operations)?

7. Do you think that the Red Cross enabled community reorganization in (Barrie/Edmonton)?

7.1 How do you think that the Red Cross achieved this?

7.2 Why do you think the Red Cross DID NOT enable community reorganization?

7.3 What would you suggest the Red Cross do to further community reorganization in post disaster situations?

7.4 Do you think that the Red Cross is in the position to do this (re 6.3)?

8 Do you feel that after 9 years (Barrie)/ 7 years (Edmonton) that you (and or the Red Cross) are prepared to respond to a similar disaster event?

8.1 Do you feel that there is just as great an urgency to prepare for disaster now as there was 9/7 years ago, immediately after the tornado, or that you (your community) have lapsed into complacency?

Appendix D Informed Consent

INFORMED CONSENT FORM

Natalia Skapski, BA
MA Student
Department of Geography
Carleton University
Ottawa, Canada

TITLE: An Examination of Selected Aspects of Disaster Recovery in Urban Environments.

STUDY DESCRIPTION:

The purpose of this research is to investigate and assess Red Cross activities as enabling community reorganization in post disaster situations. Specifically, how does the Red Cross as a disaster response community, through its activities, enable the reorganization and cohesion of a disaster affected community? The case studies for this research are the tornadoes of Barrie, Ontario (1985) and of Edmonton, Alberta (1987).

This research will benefit those interested in disaster response by increasing knowledge of the affects of The Canadian Red Cross Society activities in disaster stricken communities. It will provide an original body of research with respect to the tornadoes of Barrie, Ontario (1985) and Edmonton, Alberta (1987). And, by exploring the response capabilities of an organization that is not constantly involved in responding to large scale disasters, it will provide recommendations for future response activities of this magnitude.

Data for this research is being collected from primary documentation and from personal interview. Anonymity will be guaranteed for all personal data obtained in this research unless written consent is provided (ie from the interviewee). All document data collected will be portrayed in aggregate format as to negate any personal identifying information in presentation. Graphic presentation will also be done in a generalized manner as to circumvent personal identification by location. Subjects have

the right to terminate the interview process, or withdraw permission to access data at any time. Written consent is solicited by Natalia Skapski, MA Student, Carleton University, Ottawa, Canada, from:

- * The Canadian Red Cross Society
 - * Ontario Division
 - * Alberta Division
- * Various Red Cross officials who were involved in these two disaster events.

CONSENT: 1. For primary document data collection:

On behalf of _____, I, _____, agree to permit Natalia Skapski of Carleton University, Department of Geography, access to archived data for the Barrie/Edmonton (circle one) tornado. I understand that this data will be used for the purpose of research toward a Master of Arts degree from Carleton University, Department of Geography.

Having read the research description and in speaking with the researcher, I understand that:

- * Anonymity will be provided for all personal data gathered through a document search, for both disaster responders and 'clients'; and, that this data will be presented in aggregate format and generalized locational terms in the resultant thesis.
- * I may withdraw permission to access to data at any time.
- * Only Natalia Skapski (the researcher) will have access to the "raw" data collected from this organization.
- * Final copies of this thesis will be held by the Carleton University Library, and the Department of Geography Map Library for circulation purposes.
- * I have access to the final copy of this thesis either through my own copy provided by the researcher for the cost of printing or through access through either of the libraries listed above.

Date signed: _____

Natalia Skapski, BA
MA Student (researcher)

Interviewee/Agency
official.

Copy 1: Researcher

Copy 2: Interviewee/Agency

CONSENT: 2. For interview data collection:

I, _____, agree to participate in research being conducted by Natalia Skapski. I understand that data from this interview will be used for the purpose of research toward a Master of Arts degree from Carleton University, Department of Geography.

Having read the research description, and in speaking with the researcher, I understand that:

- * I have agreed to participate in one interview of approximately 1 hour, at a mutually agreed upon time and place, or over the telephone.

- * A subsequent interview may be desired, and may be arranged for a later date with advanced notice from the researcher as to the above specifications.

- * This interview will be audio taped and that the tape will be returned to me or erased at my request.

- * Only Natalia Skapski (the researcher) will have access to the audio tapes of this, and subsequent, interviews.

- * Participation in this interview is voluntary and I may terminate the interview at any time.

- * My anonymity is guaranteed in the presentation of this research unless I give written consent for the use of my name or title.

- * Final copies of this thesis will be held by the Carleton University Library, and the Department of Geography Map Library for circulation purposes.

Date signed: _____

Consent to future, supplemental, interview: YES NO

I consent to having my name or title made public in this research if necessary: YES NO

Natalia Skapski, BA
MA Student (researcher)

Interviewee/Agency
official.

Copy 1: Researcher

Copy 2: Interviewee/Agency

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Tables, Illustrations and Plates

Table # 1: "The Organizational Structure of The Canadian Red Cross Society" courtesy of The Canadian Red Cross Society, (no date), Ontario Division, Ottawa-Carleton Branch, Ottawa: Volunteer Services.

Figure # 2: "The Path of the Edmonton Tornado" after Bennell, Bernard (Globe and Mail Monday 4 August 1987) A map of the path of the Edmonton Tornado, p A3.

Plate # 1: "Aerial View of the Path of the Barrie Tornado", Plate # 2: "Structural Damage Caused by the Barrie Tornado" and Plate # 3: "Selective Damage Caused by the Barrie Tornado" original photographs courtesy of The Canadian Red Cross Society, Ontario Division, Emergency Services.

Plate # 4: "The Path of the Barrie Tornado" original side courtesy of Fire Chief J McAllister, City of Barrie Fire Department.

Appendix A: Registration and Inquiry Forms: Health Canada (1986) Registration and Inquiry Manual, Ottawa: Minister of Supply and Services Canada.

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