NEPE FIELD REPORT 74/0

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Emergency Planning Canada
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by

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The 1973 St. John River Flood Response

The purpose of this paper is to describe and analyze the observations made in our recent field trip to New Brunswick. The initial purpose of the field trip was to examine: (1) the nature of the problems related to the flooding and (2) the response of the Fredericton community to these problems. In the field, the research objectives were somewhat redefined to include: (1) an examination of the response to the disaster for the St. John River valley (including Fredericton), and (2) an examination of the recent history of Provincial Emergency Measures Organization (EMO) which offers an opportunity for a useful case study of the social change of an organization, both in terms of its structure and its legitimacy.

Much of the focus of our field work was on Provincial level organizations, especially Provincial EMO. This action was taken because: (1) EMO was central in the response to the flooding, (2) the structure of Provincial Government and the social structure of the province as a whole makes the Provincial level best equipped to deal with general emergencies, and (3) EMO provided a good opportunity to study the change of structure and legitimacy of an emergency-relevant organization.

Historical Sketch of Provincial Emergency Measures Organization

Provincial EMO in New Brunswick has gone through some rather major changes in the past decade. Previous to 1968, it had approximately an 18 member staff. At about this time the nuclear attack orientation of EMO lost legitimacy with legislators and the mass media. While EMO was searching for a viable role, criticism mounted until EMO was finally reduced to one man and all equipment was reallocated to other Provincial departments.

Although it is not exactly clear at this point when it occurred, as a result of a Provincial government commission, a new structure for Provincial-Muncipal responsibility sharing was instituted. Under the new arrangement, health, education, justice, and welfare became Provincial responsibilities. As a result, EMO responsibilities no longer were a municipal responsibility; rather they became a Provincial responsibility under the Department of Municipal Affairs.

Between the years 1968-1972, the EMO function was carried in the Department of Municipal Affairs budget and it consisted of one man and a secretary. One other person in the Department of Municipal Affairs was also involved in EMO functions, but on an unofficial part-time basis. During this time there was no separate vote for funds for EMO in the legislature. At this point it was not only without legitimacy, it was also virtually invisible.

By 1972, however, the outlook for EMO was somewhat more favourable. It had redefined its role to include natural disaster planning and also Provincial emergency planning. Also a small flood in 1970 and the F.L.Q. crisis were cited as additional factors which helped underline the need for a Provincial organization specifically designed to plan for and deal with natural disaster and emergency problems. As a result, the Minister of Municipal Affairs became convinced of the need for the types of services that EMO could provide under its new task definition. Early in April, 1972 he began pushing for the expansion of EMO in the legislature. One official commented "but last year when they tried to increase it from 1 to 5 or 6 you should have seen the opposition the people gave. The front page of the paper, in large letters, stated that EMO was not the type of thing we needed and that it was spending money for nothing." Thus while the Minister of Municipal Affairs was convinced of the need for EMO, the legislature and the media were still highly critical of the need for EMO. When it came to a vote in June 1972, the expansion of EMO was approved and was allocated a budget of $103,000 for the 1972-1973 year. Subsequently, it was given an approved budget of approximately $115,000 for the 1973-1974 year. As a result of this, the Provincial EMO was expanded to a staff of one part-time director, one full-time deputy director, one training officer, one planning officer, one emergency health officer, and three secretaries. One welfare planning officer is soon to be added also. Thus EMO was expanded in size, with an adequate budget and it had some degree of visibility. At this time, however, it still lacked any great degree of legitimacy with the legislature and the media and it remained virtually unknown to the general public.

Prior to January 1, 1973 there was only one part-time director and one deputy director and two clerical staff. After this time, the additional three full-time officers were added and one secretary was also added. Since the staff was expanded, most of the activities of the organization were of an orientating and exploratory nature. The new staff was sent to the EMO College at Arnprior for orientation and meetings were held with various local emergency planning officers (e.g. with the Royal Canadian Mounted Police and Canadian Forces). As a result, very little in the way of specific, concrete disaster plans were prepared by EMO when the St. John River began flooding.

The Nature of the Problem

On Friday, April 27, 1973, the St. John River was in its normal spring freshet and while being closely watched, there was no cause for alarm. Between Friday night and Saturday night, however, heavy rains in the St. John River Estuary resulted in the worst flood since 1923. A reported 1.90 inches of rain fell at Fort Kent, Maine, which is near the source of the St. John River. In the north central area of the Province, Plaster Rock recorded 3.21 inches of rain. In the central area of the Province, Beechwood reported 3.39 inches of rain. The fact that there was approximately two feet of snow on frozen ground in the northern limits of the St. John River Estuary further increased the volume of water which was running into the river.

As a result, a 100 mile stretch of the St. John River was overflowing its banks. Over 2,500 private homes were flooded and 536 families (1,600 persons) were forced to evacuate their homes in the central part of the Province. Major roads to the east and south of Fredericton and several bridges were knocked out while others were simply under water. In the Maugerville, Sheffield area, 5,000 to 10,000 acres of farmland were inundated and many of the greenhouse crops were destroyed. Approximately 1,000 to 1,200 cattle were rescued and transported to safety on barges. The hydro dams along the St. John River were cut to half their normal output (approximately 600,000 kwh) as head ponds were lowered to minimize their effects on the flooding. The power shortage was alleviated by bringing in power from Quebec, Nova Scotia, and New England.

Only one death has been attributed to the flooding. The major losses will be property damages. An estimated 5.25 million dollars damage to public property has occurred and total damages will be approximately 10.3 million dollars. While less than 20 head of livestock were lost, major losses to crops have resulted from the high water, erosion, and loss of greenhouse plants.

The Nature of the Response

The power company which operates the dams on the St. John River, has recently developed a program to collect information regarding the amount of precipitation falling in the St. John River Estuary and, by computer analysis, determine the effect on the height of the river. Based on their Saturday afternoon readings, they saw cause for serious alarm. This flood forecast system had only been in operation for approximately three weeks and consequently there was little historical data to predict how the river would react. As a result of the preliminary nature of the system it could not predict flood stages; rather it could only make flow forecasts. Thus, while unable to predict when the river would rise, it could roughly predict the level it would reach.

At approximately 4:00 p.m. on Saturday, the power company contacted the federal EMO respresentative and arranged for a meeting with EMO at 8:00 that evening. It also made news releases at 5:00 p.m. and 7:00 p.m. over the radio to warn the public of the coming flood. At that point, they estimated the highest peak would reach Fredericton on Tuesday, May 1. Actually it came on Sunday.

The federal EMO officer called the Provincial EMO officers and at 8:00 p.m. there was a meeting at the New Brunswick Electric Power Company Building. The federal EMO officer, four Provincial EMO officers, and five representatives of the power company met and the nature and magnitude of the problem was discussed. This meeting was a result of an earlier agreement by which EMO was given reports on expected water levels in the flood season. It was decided that an Emergency Operations Centre (EOC) be set up and the power company offered a large conference room on the top floor of their building as an EOC. Eventually the whole floor was to be utilized .

Emergency Operating Centre

At approximately 8:30 p.m. the meeting was completed and a series of other organizations was contacted. Among them were the Royal Canadian Mounted Police (RCMP), Canadian Forces, CBC radio station and CFNB radio, the Mayor's office, the Provincial Department of Agriculture, and the Provincial Department of Health and Welfare. From here, the EMO officials had a meeting in which they discussed the various task areas and problems which would arise. Since the pre-1968 plans were out-dated, the response to the flooding was of an ad hoc nature. The general procedure utilized was, first of all, to establish task areas; secondly, to call in resource people from various organizations; and thirdly, to assign to them the responsibility for the task area when they arrived at the EOC. The task area when they arrived at the EOC. The task areas discussed in this meeting were warning, evacuation, accomodation, feeding, health, and agriculture. The problems generated and organizations selected to respond will be discussed as we focus on each relevant organization.

After this meeting, other relevant organizations were called in and assigned tasks. Communication links were established by various means. Six land line phones were installed and the numbers were released over the radio so that the public could give and request information, report problems, volunteer equipment, and request assistance. A citizen's band club had been organized in January 1973, by a planning engineer of the power company at the request of EMO. As a result it was activated quickly in the early phases. Liaison personnel, equipped with links to their radio nets from the RCMP, city police, Department of Transport, Department of Natural Resources, and Canadian Forces were also present. Through these various land line and radio hook ups, an adequate communications ability was established. All communications were set up in two rooms. As a message came in, an EMO officer sent it to whatever group had been assigned to take care of that particular task by way of a runner. Each of these various groups had an office with liaison personnel on the top floor of the hydro building. Thus all information and task requests came in via the communications room and were directed to the appropriate organization which then activated its field resources to meet the requests. In this way, EMO was able to coordinate and direct all emergency-related tasks to maximize efficiency and minimize duplication. If the various organizations needed assistance they would inform EMO of the problem and EMO would contact the organization able to assist. By 10 o'clock on Saturday evening, all needed resources had been determined and all needed organizations had been contacted. As they arrived at the EOC they were briefed on their tasks and were given instructions as to how to operate within the EOC structure. They were requested to organize themselves to handle their task area and to check with EMO if they had any questions or problems.

Problems

While the EOC managed quite adequately, the EMO officers described various problems which arose in organization and coordination, especially in the early

phases. As already mentioned, the EOC was not a preplanned phenomenon. As a result, most people did not know each other nor did they know who was in charge of each task area, especially in the early phases. The operation expanded very quickly, between 10:00 p.m. and 12:00 a.m., and EMO felt they were losing control of their task of coordination. As a result things tended to get confused from time to time. To counteract this trend, EMO officers continued to check with each organization to ensure that it was preparing for its assigned task and they also continued to attempt to explain the overall structure which they wanted. As a result, EMO managed to establish their legitimacy as coordinators and the various organizations got to know each other. Duplication was eliminated very early in the operation.

The decentralized structure of the EOC was also problematic especially in the early stages. Until task area designations were learned and until the organizations began to turn task requests which were not their responsibility over to EMO for reallocation, duplication occurred. As soon as EMO was able to establish itself as coordinator and "priority maker," the decentralized nature of the EOC became less of a problem. However, it remained somewhat problematic since it was difficult to keep everyone abreast of changes in conditions, needs, and requests. An EMO officer was often forced to make decisions without the consultation of representatives of other organizations. An EMO official stated that he would have preferred a central core group which had liaison personnal with decision making authority from each organization so that everyone would have been abreast of developments and also to ensure the best utilization of available resources. Decisions could then have been relayed to the various decentralized offices in the EOC and the rest of the structure could have been the same. This would have minimized or eliminated the problems they experienced when the EOC was developed.

Once the division of labour which EMO had established was learned and once decisions for task allocations were deferred to EMO, the EOC began to function more smoothly. The deference to EMO for decisions is somewhat of a puzzle if we consider that: (1) EMO was not very legitimate before the flood, and (2) there was no pre-existing plan so that some other group could well have assumed the coordinating role. Many factors seem to have contributed to this eventual outcome. The fact that EMO was involved centrally from the beginning of the community response was important. The fact that EMO contacted the various organizations and requested that they come to the EOC to handle a specified problem helped to create the pattern to look to EMO for direction. The fact that EMO had previously met with the disaster planners of the Canadian Forces and the RCMP and had already legitimated themselves as an emergency coordinating organization also contributed. A less visible factor seems to have been the fact that the Director of Provincial EMO was already seen as being a powerful figure. He had previously been the Minister of Education for the Province and he was currently the Director of Administrative Services in the Provincial Department of Municipal Affairs. Thus his decisions may have been respected not so much because they came from an EMO officer but rather because they came from him.

At any rate, EMO became legitimate in the EOC and in the community very early in the emergency. The Mayor put the city departments "under the umbrella of EMO" and encouraged the public to listen to the EMO. All organizations contacted were satisfied with EMO's performance and the Premier, the leader of the Opposition

in the legislature, and the media all publicly praised EMO for its performance. Thus, from rather shaky beginnings EMO emerged with greater legitimacy and visibility than it had enjoyed for some time. By 12:00, the EOC was ready for operation.

Selected Organizations

In an attempt to describe how tasks were completed various organizations will be focused upon to explicate their role in the community response. Subsequent to this, the community response will also be described with reference to the tasks performed. In this manner a more complete picture can be conveyed.

Canadian Forces [1]

As mentioned previously, EMO had had prior contact with the Canadian Forces. This was done through the Provincial Warning Officer who was the liaison officer to the Provincial Government for the Atlantic Region of the Canadian Forces. On Friday night, the Federal EMO official contacted him and after a short meeting with Provincial EMO, a request was sent to Ottawa to release troops and equipment from the Canadian Forces Base in Gagetown, New Brunswick (approximately 35 miles southeast of Fredericton on the St. John River). A small liaison cell was set up in the EOC to fill requests from EMO and to procure releases for troops and equipment from Ottawa and/or the Atlantic Region headquarters. This liaison cell would take requests from EMO and then relay them to Camp Gagetown or the training centre over their own communication radios where the normal chain of command and normal operating procedure was used to fill the requests.

In terms of troop strength, approximately 300 troops were released in this emergency: one squadron of field engineers and one company of regular troops. In terms of equipment, the military released one heavy ferry, two power boats to move non-motorized barges on the river, one squadron of helicopters, heavy trucks, and sandbags. An additional squadron of helicopters was put on stand-by but the need never arose to call it up. The Canadian Forces officer stated that there was still a good deal more equipment (both communications and other) available so that their abilities were not taxed to a maximum by the flood. As a result, there never arose a need to establish priorities in the filling of requests from EMO. There were always enough helicopters to fill the requests as they came in. Perhaps the only shortage experienced was in the number of barges available to evacuate cattle to higher ground. This did not cause any losses;

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1. The Canadian Army, Air Force, and Navy were reorganized into the Canadian Forces and while they are still operationally distinct, they are under a more central chain of command as a result of the merger.

it merely meant that cattle evacuation took four to five days. In addition to its role in the evacuation of farm animals, evacuees from the nearby area were housed in Camp Gagetown until they could return to their homes. Canadian Forces troops were also involved in search-and-rescue operations with amphibious aircraft, helicopters, and smaller water craft.

Royal Canadian Mounted Police

At about 9:00 p.m. Saturday, EMO contacted the RCMP and requested that they send a liaison unit to the EOC to establish a working link between the EOC and the RCMP. The RCMP sent this liaison team to the EOC and proceeded to put its own disaster plan into operation. It called its regular forces and put them on weekend alert but did not activate more regular forces since those on highway patrol could be put on emergency tasks. These forces were freed since large parts of highway regularly patrolled were now under flood waters. About 25 to 30 non-paid, trained auxiliary police came in when contacted and the RCMP also had about 100 of its regular people on land and water. It had three large boats and one truck capable of moving in deep water to augment its cruiser capabilities.

During the emergency response, it kept close radio contact both with the EOC and with the Canadian Forces to ensure that all task and responses were well coordinated. The types of tasks that the RCMP handled were: (1) barricading highways under water to prevent people from getting their cars stalled and thus blocking roads in use by high wheel vehicles; (2) evacuating and warning people about the high water; (3) looting patrols, by boat, in the areas of evacuated homes; and (4) patrolling boat traffic on the river. They estimated they checked about 75 percent of the 500 homes evacuated in the Fredericton area, as well as checking some 75 boats on the water to ensure that they were being utilized in a safe manner to try and prevent water accidents. They were primarily involved in looting patrols and boat checking and only carried out about 25 evacuations.

Provincial Departments of Forestry and Natural Resources

Between the two departments, this organization had about fourteen boats large enough for use on the river in the evacuation stage. The department of Natural Resources used its radio capabilities along with the RCMP and Department of Fisheries to augment the communications abilities of the EOC operation. The Department of Natural Resources personnel were also given the task of building an inventory of volunteers and equipment as it was volunteered and/or located. They were also placed in charge of dispatching this equipment and attempted to increase efficiency by assigning the nearest equipment to the location requesting it.

Ham and Citizen's Band Radio

As previsouly mentioned, an amateur radio net had been developed to handle emergency problems on EMO's request in January 1973. As a result, the radio communications which it could offer were set up by early Sunday morning. Some 50 amateurs were used on a rotating basis to augment other communications nets as they were needed. They played a major role in supplying the communications on the barges with the cattle evacuation centre at the Burton Bridge. They also acted as relay stations between the cattle rescue centre and the EOC.

Local Radio Stations

Both local radio stations were called by 9:00 p.m. Saturday and were requested to send liaison personnel to the EOC to act as an information link to the general public. From the beginning it was made mandatory that all news releases were to be approved by an EMO official before being used to ensure that they were accurate and factual. One station was normally in 24-hour operation and the other station went to a 24-hour operation from Saturday until Thursday. The stations broadcast the EOC telephone number to the public and relayed to the public any requests for assistance or equipment. The mobile units of one station also patrolled the north side of the river and gave the EOC updates on the changing conditions of the river, especially on Saturday night.

City Departments

The Police Department received a call at about 10:00 p.m. on Saturday and sent a police officer with a portable radio to the EOC to act as a liaison officer. Throughout the emergency, the department was concerned with traffic control, prevention of looting, and restricting use of the only bridge in service between the north and south side of the river in the Fredericton area.

The City Engineers were alerted and proceeded to "water proof" the pumping station for Fredericton which was situated at the water's edge. As a result, the water supply was not interrupted.

The only other city department directly involved was the Fire Department and its task was to pump out the basement of the legislature to try and save documents stored there.

The Local EMO Planners

As stated earlier, the EMO function is a Provincial responsibility and as such the municipality has no EMO organization. Provincial EMO has divided the

Province into ten districts along county lines. In each of these districts, an employee of the Provincial Department of Municipal Affairs has (among other duties) the role of EMO coordinator. In Fredericton, the Local Coordinator was the election's return officer for York and Sunbury Counties. He did not take a very active role throughout the emergency, perceiving that since Provincial EMO was situated in Fredericton, they would handle the emergency. The local coordinator, having no emergency plans, saw his role as that of acting as a resource person if needed. There seemed to be some uncertainty, furthermore, about what the local coordinator's task responsibilities were, this partly being indicated by the fact that the EMO responsibilities were seen as tacked on to other duties and responsibilities which were attended to during the emergency.

Downstream in the city of St. John, the situation was somewhat different. Provincial EMO contacted the County Coordinator in St. John and he set up an EOC to coordinate that community's response to the flooding. From what little we learned of that operation, it seems that the local coordinator in St. John was quite active in carrying out his responsibilities.

Further research would be necessary to determine if the current linking of EMO responsibilities with other task responsibilities of local area coordinators is a particularly vulnerable point. It may be that a local area coordinator may not take his EMO tasks seriously because he knows that the Provincial EMO will act. It may also be that a local coordinator will neglect his EMO responsibilities because of other tasks, and particularly since emergencies are intermittent, the disaster responsibilities may be laid aside. Perhaps this EMO function is set aside because Provincial EMO is low on legitimacy and in many cases until recently, short on manpower. It may be that the EMO task is not stressed or clearly defined when local encumbents receive there positions. At any rate we had two different patterns of response in our cases, the explanation for which may or may not be indicated in the just stated possibilities.

The Emergency Response

Warning

Warning was inadequate for a number of reasons. First of all, the rain came twice as fast as the weather bureau had predicted. Secondly, while water was already in its normal spring freshet and had caused some flooding in the Maugerville-Sheffield area, there was no cause for alarm since this was an annual occurrence. As often happens, when the people who lived in this area were warned of extensive flooding, they refused to evacuate themselves and did not move their animals to higher ground. Relying on previous experience, they did not think they would be in any greater difficulty than they normally were. Thirdly, since the power company was not able to predict river flood stages, their estimated time of flood impact was very inaccurate and the flooding reached Fredericton several days before expected. Thus while people were warned that major flooding would occur the above problems tended to counteract its effect.

Evacuation

As a result of the above problems, evacuation was generally carried out on a last minute basis. The effects of this were quite serious in the area of cattle evacuation. Since farmers would not move their livestock by truck when advised to do so, a great deal of time and effort was required to move the cattle by barges after the cattle had been trapped on high ground.

As for human evacuees, the local ministerial association had arranged for their shelter in the residences of the University of New Brunswick in Fredericton since the semester was over and they were empty. Accomodations were also made available at Canadian Forces Camp Gagetown. Approximately 280 of the estimated 500 evacuees in the Fredericton area went to accomodations at UNB. The other evacuees stayed largely with friends or relatives.

Search and Rescue

Search and rescue was essentially carried out by the RCMP, Departments of Forestry and Natural Resources, Canadian Forces, and volunteers. While a door-to-door search was conducted, most of the effort was simplified since telephone service remained intact for a long time into the emergency stage and people called in for requests to be rescued. As mentioned earlier, most of the need for rescue was created by short warning and the expectations of the people in the flooded area. Most of the search and rescue, which had begun at dawn, was completed by late afternoon on Sunday. Some people who had stayed the night without heat or power, however, requested to be rescued on Monday. Much of the equipment used in these rescue operations had been procured as a result of an EMO request over the radio early Sunday morning for boats and trucks, etc.

Livestock Evacuation

Two agriculturally related problems were created by the flooding. Large greenhouse crops were grown in the Maugerville-Sheffield area and due to the short warning and incredulity of the farmers, they were not moved in time and were lost. The other problem was the removal of approximately 1,000 to 1,200 cattle which were stranded on high ground. The EOC had anticipated this problem and prepared to act on it at sunrise. The livestock rescue centre was a joint effort of volunteers, Canadian Forces troops, Department of Agriculture, Ham Operators, and the affected farmers. Some problems were experienced in the early stages until the EMO training officer, who was raised in the area, appeared on the scene to reassure the farmers and to initiate a more efficient dispatch of rescue barges. After about 11:00 p.m. on Sunday duplication was eliminated. This operation continued until late Thursday with the loss of only four head of livestock.

Community Order

As mentioned previously, the RCMP took care of most of the traffic patrols in the county as well as a boat patrol on the river to check boat use and to check the evacuated homes to ensure they were not being looted. The city police took responsibility for traffic patrols and security surveillance in the city. No other outside forces were needed and neither force called in extra staff, although they put extra troops on standby. Thus it is apparent that the flood did not create many extra demands for community order organizations.

Recovery

Although the field research team was to leave the area before this stage was reached, a few indications of how this would be handled were available. On Wednesday, as the flood waters receded, the Health Department began inspecting homes to determine if the residents could return to them. Money for a relief fund was being collected by a local bank and a committee would be established later to dispense the funds. Assessment of damages would be done in the public sector by the Federal Department of Public Work, the Provincial Department of Highways, the Federal Department of Agriculture, and the Provincial Department of Agriculture. Private sector damages would be estimated by the Maritime Insurance Adjustments Association.

Under Federal- Provincial releif sharing arrangements, New Brunswick must spend $627,000 before the Federal Government pays anything. For the next million dollars, the cost is shared on a 50-50 basis. The next million is split 75-25. For any further expenses the split of a relief is 90 percent Federal and 10 percent Provincial. Since the EOC was phased out on Friday afternoon, most of the recovery operations were carried out via normal time channels.

Conclusion

In short, it can be said that EMO played a central role in the response to the flood and in the process it greatly increased its visibility and legitimacy. While the EOC experienced some problems in the early stages, it eventually was successful in coordinating a rather effective emergency response. Perhaps the weakest phase of the response was the warning. This problem may well be alleviated in the future as the flood forecasting system gets more basic data on the St. John River Estuary and becomes able to accurately predict not only the flow but also the stages of flood crests.

Appendix A

A list of potential disaster agents was distributed to eight representatives of various disaster relevant agencies and they were asked to state the probability of the various disaster agents affecting the Province in the next decade. While the sample is small, a rough estimate of their perception of the disaster proness of their Province is possible. Below the disaster agents are arranged in order of probability along with the mean score given by the respondents.

key

0 = not applicable
1 = not probable
2 = low probability
3 = moderate probability
4 = high probability
5 = nearly certain

Disaster Agents	Mean Score
Blizzard	4.4
River Flood	4.3
Severe Fog	4.3
Forest Fire	3.8
Major Frost	3.6
Chemical Spill	3.5
Ice Storm	3.5
Water Pollution	3.3
Flash Flood	3.1
Oil Spill	3.0
Electric Black Out	2.8
Massive Automobile Wreck	2.8
Ship Disaster	2.8
Industrial Explosion	2.5
Mine Disaster	2.5
Hail Storm	2.4
Sudden Waste Disposal Problem	2.4
Dam Break	2.0
Water Main Break	1.9
Radiation Fallout	1.8
Hurricane	1.8
Earthquake	1.8
Epidemic	1.6
Landslide	1.6
Drought	1.5
Meteorite Fall	1.5
Water Shortage	1.4
Plane Crash	1.4

Disaster Agents	Mean Score
Volcanic Eruption	1.3
Sand Storm	1.3
Smog Episode	1.1
Tornado	1.1
Gas Main Break	1.0
Tidal Wave	1.0
Avalanche	0.3

Appendix B

On June 12th, 1973, an article in the St. John Newspaper, The Telegraph Journal, gave a brief history of the flooding on the St. John River. While it is sketchy in places, it gives some indication of the regularity of the flooding on the River. The rest of this Appendix will be a partial quotation of the mentioned article. From it, it can be seen that the St. John has tended to flood about every 20 to 40 years.

> Records of flooding on the St. John go back as far as 1696 when, apparently, a late and very high spring freshet caused late planting and crop failures at Jemseg. Little is known of the real magnitude of those early floods, but the instance of a store in Fredericton being swept by ice in the flood of 1768 conjures up a bizarre picture.
>
> In October 1798, so the reports at the time say, not a mill dam was left intact for 30 miles around Fredericton following three days of flooding. The floods also left pasture lands covered with sediment.
>
> Getting closer to the present time, accounts of floods become more frequent and more comprehensive -- which is not to say the floods themselves have become more frequent, merely that a greater number of records have survived.
>
> In 1831 (or 1832 -- there is some confusion), an ice jam caused water to rise four feet on Queen Street in Fredericton, while in the spring of 1846, Kewsick Island lay for a time under 12 feet of water, with all houses swept away.
>
> In 1851, reports tell of what may have been the first instances of flood warning, with loss of goods stacked on wharves at Fredericton avoided, thanks to a telegraph message sent from Grand Falls.
>
> The period of April 25-May 14, 1887, witnessed one of the most serious floods ever to have occurred in the St. John basin, produced by a combination of ice jams, heavy snow accumulation, and heavy rain on April 19-30 over the upper and middle portions of the basin. This was also complicated by a high spring tide in the Bay of Fundy.
>
> A peak level of 26.82 feet above mean sea level was estimated in newspaper reports at the time . . . four feet of water on Brunswick Street in Fredericton . . . the main railway line upstream of Woodstock was washed out . . . and the Maugerville-Sheffield area was particularly hard hit (as in this year's flooding).

Water rose halfway up many houses. No division was discernible between the waters of the St. John and those of Grand Lake.

On May 13 of the 1887 flood, the 75-foot-long Nerepis Bridge was seen floating past Indiantown.

Loss of livestock during these reports of flooding was high, but only occasionally was there a loss of human life. One occurred this year.

In March 1902, one life was lost when an ice jam on the Nashwaak at Stanley gave way.

In June 1922, newspapers reported flood damage totalling $1-million in the province (mostly on the St. John).

April-May 1923 saw 57 bridges damaged or destroyed, and a total crop loss to market gardens in Maugerville-Sheffield.

In April 1934, at least a million feet of lumber were lost in the Grand Falls and Woodstock areas.

In March 1936, unusually warm weather at spring breakup brought about ice jams all over the basin. The CN railway bridge at Fredericton eventually gave way due to ice piling up against it. An all-time level of 30.7 feet above mean sea level resulted in the Fredericton district, leaving three-quarters of the business district under water.

And so the story of flooding continues, with the flood of April-May 1973, only the latest chapter in a continuing and, possibly, never-ending saga.

The Plan d'Action Plan report says this year's "was a particularly bad one."

"Damage estimates certainly are an all-time record for the basin, but we might contemplate a little on how much this was due to the magnitude of the flood itself and how much to our continued thoughtlessness in siting new developments in areas of flood risk. The location of mobile home courts on an obvious flood plain is a classic example."

"Let there be no doubt, of course," says the report, "that we have just witnessed a very extreme hydrological event, with an estimated probability of occurrence of once in several hundred years. Let us also remember, however, that this low probability gives no absolute guarantee that it won't happen again next year."

The 1973 St. John River Flood response /