

# **Evaluation of a Literature Review of the Social Impacts of the 1997 Red River Valley Flood**

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by the

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## Introduction

The purpose of this project was to evaluate and draw conclusions from the social science research studies described in “Social Impacts of the Red River Valley Flood: A Literature Review,” by Janet Rex, which was submitted to the International Red River Basin Task Force of the International Joint Commission by the Natural Hazards Center of the University of Colorado in July 1999. That literature review identified social science research, either completed or underway, that explored social impacts of the 1997 floods on the Red River of the North in the United States and Canada.

This report evaluates the methods and findings of those previously identified studies, notes common and missing themes, and suggests further work to remedy the principal gaps. An author and geographic index to the prior literature review is also provided.

The literature review included abstracts to 44 research studies or reports on the aftermath of the flood. A total of 25 abstracted reports had no pertinent scientific findings: 18 were merely descriptive, one was a model of future economic conditions, one discussed a disaster research method, two were suggestions for improvements in operations of specific agencies, and three referred to work in progress. The abstracts for which there were no findings are indicated by an asterisk (\*) in the Index. The remaining 19 reports have research findings on these topics: 1 on flood warnings; 1 on flood insurance; 2 on human services; 3 on domestic violence after the flood; 1 on psychological predictors of distress; 1 on gender roles; 1 on marital relationships; 3 on the flood’s impacts on women; 1 on its impact on students; 4 on the business community after the flood; and 1 on government response.

## Findings and Themes

Because of the relatively small amount of research undertaken after the Red River flood (in comparison to the number of issues that *could* have been investigated), there was almost no duplication of findings from one study to the next. No single area of inquiry was exhaustively studied, either, so while there are several conclusions to be drawn about the impact of the flood on women, for example, it cannot be said that we now know *all about* the flood’s effect on women in the Basin.

What follows are conclusions that can confidently be made about the social impacts of the flood, based on the research listed in the prior literature review. Care has been taken to present only clear findings, without layers of interpretation. It remains for policy makers to analyze the implications of these findings, and make judgments about the significance of the research findings to Basin policies, programs, and activities.

**Although the National Weather Service predictions could have been better, people contributed to the problem by misinterpreting them.**

In hindsight, the National Weather Service's flood stage predictions could have been more accurate, but local decisionmakers and the public misunderstood and misused the predictions that were issued. In reality, there was (and is) a degree of uncertainty about any flood stage prediction, particularly under the circumstances prevailing in the Grand Forks area before the flood. Misunderstanding of this, and overreliance on the warnings that were issued, led people to neglect their own options for preparing for the flood, purchasing insurance, and mitigating damage (Pielke, 1999).

**The involvement of numerous levels of government in the greater Grand Forks area during and after the flood led to a “disconnected and uncoordinated” recovery.**

Some of the principal problems centered on the limited technical and financial capacity of the local governments; the apparent lack of communication among different organizations at all levels; and control, or the flow of responsibility, from level to level and from agency to agency (Kweit and Kweit, 1998). It should be noted that the main source relied upon by these researchers for information about local perceptions of the recovery was the *Grand Forks Herald*.

**The vast majority of people in Grand Forks knew about flood insurance but thought they did not need it.**

Of all the homeowners in Grand Forks, 94% knew about flood insurance, but only 20% had it at the time of the flood. Of those who did not have insurance, about 40% had actually inquired about purchasing flood insurance, but decided not to do so. Those who decided not to purchase insurance cited these reasons: they believed the National Weather Service crest predictions; they thought the dikes and flood control devices would provide adequate protection; and they thought that a flood would not damage their home (Pynn and Ljung, 1999).

### **Impacts on Business**

- **During the summer after the flood, most Grand Forks businesses had resumed operations.** Only about 9% of all Grand Forks businesses remained closed a few months after the flood (about 22% of the downtown businesses). Of those, over half indicated that they planned to reopen, most at the same location. “Financial burden” was the reason given by over half of those who said they would not be reopening (Staples, no date).
- **Most Grand Forks businesses had other concerns one year after the flood.** When asked what their biggest business problem was one year after the flood, only 3% of businesses said “finding time and money to recover” from the flood. When asked what single change they would like to make to Grand Forks, having the flood protection systems finished ranked fifth out of 17 choices (with 4% of businesses choosing this change) (Staples, no date).
- **The flood resulted in some relocation of businesses in Grand Forks.** One year after the flood, about 15% of Grand Forks businesses had relocated because of the flood; 43% of those said that their new location was better (Bronson, no date).

- **The flood had some positive impacts on the Grand Forks business community.** About 40% of Grand Forks businesses experienced an increase in business volume as a result of the flood; of those, the majority were undamaged by the flood. About one-quarter of the city's businesses used the flood recovery as an opportunity to upgrade or adopt new technology: half of those planned to obtain new computer hardware or software; 20% were planning to install new manufacturing or processing equipment; and 15% planned to upgrade their facilities (Staples, no date).
- **The flood resulted in a labor shortage in Greater Grand Forks.** There was a shortage of labor in the early months after the flood. (Staples, no date). One year later, 44% of businesses said that employees were the single resource hardest to obtain (Bronson, no date) and one-third of the businesses reported they were looking for employees at that time (Staples, no date).
- **Business recovery in Grand Forks was influenced by the owner/manager's optimism.** The optimism of business owners and managers (as measured by a simple test) was more important in predicting successful business recovery in Grand Forks than was the extent of damage to the business or to the owner/managers' residence (Bronson, no date).

#### **The University's student population was somewhat affected by the flood.**

According to a survey conducted during the summer after the flood, only about one-half of one percent of the student body could have been expected not to return to the University of North Dakota in Grand Forks at the next term because of the flood. Varying percentages of students had concerns about future floods occurring, flood safety, flood damage to property, and impacts of the flood on campus and community life. Students who had suffered little or no damage during the flood had the lowest levels of concern (Staples, 1997).

#### **Day care for children was seriously disrupted by the flood.**

Two months after the flood, only about 12% of the children previously in day care had spots available to them. This disruption lasted many months, and presented problems for people trying to return to work, contributing to the reported labor shortage (Fothergill, 1999; Kenna, 1997; Staples, no date; Enarson, no date).

#### **The flood had a disproportionate impact on women in both Canada and the United States.**

- **The widespread disruption in housing after the flood seriously affected women,** perhaps more so than men. Women tended to shoulder more of the responsibility for domestic arrangements and duties, and these were made much more difficult when undertaken in temporary, often unsuitable housing arrangements (Enarson, no date; Fothergill, 1998).
- **Women with home-based businesses, especially day care, had their businesses as well as their homes disrupted**—first by the evacuation and then by the flood damage to housing (Enarson, no date).

- **Female-owned or managed businesses in Grand Forks were twice as likely to remain closed** as the others in the early months after the flood (Staples, no date).
- **Women in the United States were at increased risk of domestic violence after the flood;** protection orders increased significantly, as did counseling calls to crisis centers. The Grand Forks shelter closed, leaving a gap in safe housing. Shelters closed or relocated and some women were forced by the flood to re-establish contact with or even return to violent partners (Enarson, no date).
- **Stereotypic gender patterns became more prominent after the flood, to the detriment of women.** Women's domestic and kin work intensified when living conditions were disrupted, but both men and women tended to discount the extra behind-the-scenes work women did before, during, and after evacuation (Enarson and Scanlon, 1999; Enarson, no date).
- **Most women interviewed in Grand Forks reported a sense of accomplishment, confidence, and competence as a result of having to assume multiple roles** (additional domestic duties because of flood and the related evacuation; a paid job or profession; and volunteer relief, emergency response, and other activities),(Fothergill, 1998).

**Some marital relationships were affected by the flood.**

Among Greater Grand Forks couples, marriages that were strong before the flood emerged stronger in its aftermath; weak pre-flood relationships were weakened. The relationships of couples with moderate levels of flood damage fared somewhat more poorly than the relationships of couples with little damage or total damage (Davis and Ender, forthcoming).

**Domestic violence in Grand Forks increased after the flood.**

Those with lower social support, the elderly, and those with a prior history of violence were most affected (Clemens et al., 1999).

**Domestic violence programs in the Red River Valley were seriously hindered by the flood.**

As much as one year afterwards, programs reported increased demands for service but fewer organizational resources (personnel, facilities, and money) than before the flood. In addition, the programs were largely unprepared to protect battered women and their children during and immediately after the flood, when housing was disrupted (Enarson, no date).

**Racial and cultural bias was evident in some aspects of recovery in the United States.**

Migrant families lost access to low-cost housing and other supplies, but were offered little recovery assistance. Some Hispanic women reported that volunteers in some relief projects effectively restricted aid to non-Hispanic residents (Enarson, no date).

**Grand Forks residents threatened with the loss of their resources reported the most psychological distress in the early stages of the flood.**

The prospect of losing such valued attributes as possessions, relationships, and financial status was a better predictor of who would experience distress in the weeks before the flood than

factors like age or prior disaster experience. The distress reported included stress-related physical and psychological symptoms and negative moods. Further, the people who anticipated the greatest amount of loss reported the most distress (O'Neill et al., 1999). It should be noted that the researcher's sample was limited to university faculty and staff.

**Overall, clients of social services entities in Grand Forks reported getting better service after the flood.**

Clients reported receiving more and better attention from individual professionals and from organizations, and cited the expanded efforts of some entities (such as the Salvation Army and various churches and church groups) and the appearance on the scene of new sources of assistance (such as the Federal Emergency Management Agency and the Red Cross) (Heitkamp, 1999).

**The Grand Forks human services delivery system rose to the challenge of responding to the flood.**

Practitioners dealing with social issues of children, families, mental health, and gerontology, although victims themselves, functioned well in coping with their professional duties arising from the flood (Heitkamp, 1999). The Grand Forks area's human services system's response to the flood was "effective and innovative." This was due to dedication of people; an organizational structure with central leadership and accountability; availability of technology like cell phones, computers, email; and empathy in dealing with clients brought about by the workers being victims themselves (Dawes, 1997). It should be noted that the latter finding is not based on empirical research but rather on a series of evaluative descriptions by area practitioners and program administrators of how various organizations and agencies coped with the emergency. The human services agencies that analyzed their own response and recovery work (the basis of the Dawes analysis) generally noted that preparedness could have been better, and they made numerous recommendations for improvements in coordination, organization, operations, and procuring supplies for the next disaster.

**Certain groups in Greater Grand Forks were negatively affected by the flood.**

A majority (65%) of social practitioners dealing with juveniles, the family, mental health, and gerontology said that their clients were negatively affected by the flood. Those with fewest economic and personal resources beforehand were most negatively affected. Financial and housing problems caused clients more anxiety and depression; and increases in family violence, alcohol abuse, and acting-out behaviors among youth were reported (Heitkamp, 1999).

## **Methods**

By and large, all of the findings listed were the result of adequate and appropriate research methods. The samples were of sufficient size and appropriately selected. As far as can be determined, the surveys, interviews, and questionnaires used were appropriate techniques, and they appeared to have been analyzed by standard means. The exceptions to this were three studies whose findings should be considered in light of the methods used. The study on predictors of psychological distress (O'Neill et al., 1999) was carried out on a sample drawn only

from university faculty and staff. To the extent that these subjects are not representative of the rest of the Basin population, that study's findings should not be generalized to that population. Second, the summary of the performance of Grand Forks human services agencies was based on self-evaluations by the agencies themselves, not by external, objective sources, and thus is subject to bias. Third, the judgement about the intergovernmental recovery efforts in Greater Grand Forks was based on newspaper articles, considered to be non-authoritative sources.

Because there was little or no overlap in topics and findings, there is no judgement to be made about whether a given study's finding is more reliable than another. About half of the work described in the Literature Review was of a simple descriptive nature; these published articles did not yield scientifically based findings, so none were listed above.

### **Inconsistencies among the Findings**

There were no notable inconsistencies among the findings reported in the literature review. There were, of course, differences in point of view, and in drawing implications from the findings. For example, both Fothergill and Enarson found that the flood imposed great burdens upon women. Enarson interprets this situation as a need for additional planning and support services for women as part of disaster preparedness by the public and private sectors. Fothergill, on the other hand, notes that women made the best of the situation and found meaning and increased self-confidence in fulfilling multiple roles.

### **Missing Topics**

The social science disaster research has for many decades bemoaned the lack of truly comprehensive evaluations of the aftermath of extreme events, and the Red River flood is no exception. It is much easier (and more accurate) to list what is known as a result of the social research conducted after the flood than it is to state what is missing, because the topics for which scientific data now exists are but a small fraction of those that could have been explored. It is possible, however, to outline some broad areas in which the gap in findings may be significant: research that was not uncovered for this study, research that is incomplete, and topics for which research simply was not done.

### **Undiscovered Research**

Because the traditional bibliographic search techniques used to generate the literature review focused almost exclusively on formally published documents, there doubtless are completed studies missing from that compilation. The findings from any such studies may have been reported "in-house," or posted on an Internet website rather than in the academic literature, or released, if at all, through other means. An example of this is the study of the impacts of the flood on basin-wide resilience, conducted for the International Red River Basin Task Force by the University of Colorado and the University of Manitoba, which was not uncovered in this search because it was not published in the formal literature. Also missing from this analysis is any work

in progress (and hence not published) by individual researchers or university research offices that did not respond to inquiries.

## Research Underway

Of course, there are no findings available from studies that are not yet finished. There are doubtless a number of projects underway that fall into this category. Three such studies are listed in the literature review (see section on Work Needed, below).

## Issues not Studied

The social issues on which research was conducted after the 1997 flood were fairly subjectively chosen. Although, as is usual, a proportion of research was policy-driven, in most instances researchers used the opportunity presented by the disaster to study topics and issues that interested them, or that had a bearing on their areas of expertise. Thus it would be wrong to assume that the issues that appear in the literature review and in this analysis—those for which scientific data now exist—are really the most important policy issues faced by the Basin. Among the topics that appear not to have been addressed are the following.

- **Basin-wide flood resilience.** To what extent did the flood contribute to, or detract from, building individual, local, and regional resilience in the face of future floods? This is a very significant and enduring social question, because it gets to the heart of whether or not progress is being made over the long run in minimizing overall flood loss throughout the Red River Basin. There are innumerable questions that go to this issue. Have the many “mitigation& actions taken after the flood on both sides of the border (for example, the “97 + 2” rebuilding standard in Canada and the many projects funded in the United States under the Hazard Mitigation Grant Program) actually increased flood resiliency? If not, how can they be changed?
- **Temporary housing.** The extensive and long-lasting displacement of the population after areas in both Canada and the United States were evacuated provides a fairly unusual opportunity for investigation. What was the effect on people of living in temporary housing for so long? To what extent was new technology—such as the Internet or cellular telephones—used to keep people informed about flood recovery and in touch with each other or with the outside world?
- **Quality of life.** How was the Basin residents’ quality of life altered as a result of the flood? Were there lasting impacts on such components of sustainability as recreation, aesthetics, local and regional environmental quality, and economic vitality? If so, how can such impacts be avoided in the future?
- **Long-term impacts.** Some of the most important questions will be those about the long-term social consequences of the flood. A good opportunity for answering some of these questions exists in the Red River Basin because of the large amount of baseline information gathered in the wake of the flood on both sides of the border. Even for issues

that were not systematically studied, some basic information often exists, and it would be extremely useful to be able to assess what the long-term impacts of the flood have been on any of the topics listed below after three years, five years, and so on.

- **Children and families.** How did the flood affect children of various ages? Adolescents? Family relationships? Was there a cross-border difference?
- **Marginalized populations.** Were there differential or disproportionate impacts on racial and ethnic minorities; low-income households; the elderly; the disabled? Was there a difference in these impacts between the United States and Canada?
- **Cultural impacts.** Did the flood affect cultural programs, activities, facilities, church membership, sense of community?
- **Agriculture.** Were there long-term impacts on agriculture? Did farmers change practices as a result of the flood? What kinds of damage were experienced? Were agricultural buildings differently affected?
- **Schools and the educational system.** To what extent were schools disrupted? Were there long-term impacts on the Grand Forks students who missed two months of school? How did the experience of the two countries differ?
- **Housing.** Was there differential damage to certain housing styles? Are certain architectural features less prone to damage? If so, how could their use be encouraged? Were there preferences in rebuilding? What were the cross-border differences and similarities?
- **Non-market losses.** Was non-market damage catalogued or quantified? If not, how could the loss or diminution of cultural attributes, sense of place, environmental amenities, and the like be valued? To what extent did the flood result in other “unmeasurable” losses such as physical and mental illness or postponed retirement?

### **Work that is Needed**

One next step would be to monitor the progress of the projects not completed at this writing, namely:

- The study of the interaction of government and non-governmental entities across the U.S.-Canadian border (Wachtendorf, see p. 11 of the literature review);
- The study of the effect the flood—and the caretaking responsibilities it brought—had on women’s health in southern Manitoba (Grant, see p. 34); and
- A survey of clients’ perceptions of the social services provided in Greater Grand Forks during recovery from the flood (Heitkamp, see p. 51).

It would be worthwhile to follow up on any of the research ideas listed in the section on Issues Not Studied, above.

It would be particularly useful, and relatively simple, to do followup studies on some of the findings presented in this report. For example, a certain number of years after the flood, how many people carry flood insurance? Why or why not? Have the reasons changed from those reported by Pynn and Ljung (1999)?

Another, different type of search for studies could be conducted of entities that might have done policy analyses (like local, state, regional, provincial, or federal agencies or non-governmental organizations). For example, the Minnesota Center for Environmental Advocacy did an analysis of the impacts of the state's flood recovery activities on the environment. These types of reports could yield additional significant information that has a bearing on Basin programs and policy for flood loss reduction and resilience.

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\*Denotes abstract of study for which no pertinent scientific findings are reported here.