

When disasters defy borders: what we can learn from the Red River flood about transnational disasters.

Introduction

In his 1990 presentation to the World Congress of Sociology, Uriel Rosenthal stated that ‘we are moving from cross-national research of separate disaster cases to transnational research demands imposed upon us by the international and transnational dimensions of modern disasters themselves’ (Rosenthal 1990). This assertion should come as no surprise to researchers and practitioners alike. After all, political boundaries often intersect natural systems (Ingram et al. 1995) or rely on these systems—such as rivers and mountainous ranges—as their borders.

As a result, the actions taken in one country can significantly affect the disaster vulnerability and effectiveness of emergency management strategies in the neighbouring country. Recent cross-border floods, hurricanes, and ice storms,

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as well as technological disasters such as the 1986 Chernobyl radiation release and the 2000 Romanian cyanide spill, demonstrate the importance of examining borderland vulnerability, cross-border decision-making on environmental issues, and how or if political jurisdictions interact in response to the threat or impact of transnational disasters.

The 1997 Red River flood is a relatively recent case of a transboundary disaster. The flood occurred in the spring of 1997 in the Red River Basin—a 45,000 square mile area spanning sections of the prairie province Manitoba, Canada and states of North Dakota and Minnesota, USA.

northward (see table 1).

Several communities were completely overwhelmed by the flood-waters; residents in many more were forced to evacuate their homes as a precautionary measure; almost all expended resources in an effort to mitigate or respond to the disaster. More than 80,000 people were evacuated from their homes and the region suffered billions of dollars in flood preparation costs and property damage.

To study the transnational dimensions of the flood, in-depth interviews were conducted with sixty-two key government officials and non-governmental representatives from principle organisations on both sides of the international border and attended several flood-related public meetings in Manitoba and North Dakota. Document research was also conducted, from early March 1997 until approximately May 1998, which involved analysis of flood-focused news articles, press releases, maps, historical data, water-level updates, pictures, governmental and non-governmental reports, emergency response plans, and cross-border agreements.

Who depends on whom?

When planning for transnational disasters, it is important to consider whether or not organisations will depend on their foreign counterparts for information, direction, and resources. In the case of

Setting the scene

The Red River Basin is found in the upper center of North America (see figure 1). While the majority of the basin lies in North Dakota and Minnesota, USA, the northern portion of the basin lies in Manitoba, Canada. The Red River is a 315 mile long, northwardly flowing body of water that serves as the state border between North Dakota and Minnesota, and vertically connects the many Canadian and American cities, towns, and rural communities along its banks.

The region has a long history of flooding, with significant flooding of the Red River occurring approximately every 10 years. But the 1997 flood was more severe than most due to high autumn soil moisture, high winter precipitation, the rate of the spring snow melt, the timing of the south-to-north progression of the melt, and spring precipitation. Over several weeks, the flood threat travelled



Figure 1: Map of the Red River basin.

Courtesy US Army Corps of Engineers, Remote Sensing/GIS Centre, Hanover, NH and Environment Canada, Ecological Research Division, Regina, Saskatchewan

City or town	date of river crest
American Cities	
Wahpeton/Breckenridge	April 16
Fargo/Moorhead	April 18
Grand Forks/East Grand Forks	April 22
Pembina	April 26
Canadian Cities	
Emerson	April 27
St. Agathe	May 2
Winnipeg	May 3

Table 1: Progression of the 1997 Red River flood crest

the 1997 Red River flood, Canadian and American organisations were more dependent on each other for information than for shared decision-making or resources (although instances of the latter also occurred.) Moreover, much of the interaction between Canadian and American organisations that took place during the warning and response phases of the flood mirrored the relationships and dependencies in place during routine periods. The direction of that dependency—that is, who depended on whom—was often connected to the timing of the disaster impact, which in this case occurred at different times for each country.

One example of these relationship patterns can be found between Canadian and American forecasting agencies. The Red River flows northward and, therefore, American data was particularly important to Canadian hydrologists. In order to determine its water-level predictions for Canadian communities, the Manitoba Department of Natural Resources heavily relied on American organisations—such as the United States Geological Survey and the National Weather Service—for precipitation, soil moisture, snow-cover, stream-flow, and water-level data. Yet these same organisations routinely exchanged such data during non-crisis periods to determine potential water-levels for the Red River, as well as other rivers systems that flow south from Manitoba into Minnesota and North Dakota. Here patterns of interaction between Canadian and American organisations during the disaster were based on routine relationships; however, where there was an interdependence during routine periods, Canadian organisations were more dependent on the United States because the flooding threat moved from south to north.

For the most part, Canadian and American organisations were dependent on each other for information, including water-related data, road closure updates, water-quality reports, and accounts of the flood's severity. In several isolated cases, American organisations provided or offered resources to Canada. Several American communities provided excess sandbags to towns in Manitoba and some Americans who evacuated to Manitoba stopped to aid sandbagging efforts in the province. After the river's crest passed Grand Forks and East Grand Forks, the National Weather Service offered to send hydrologists to assist the Manitoba Department of Natural Resources. Manitoba turned down this offer, as they



Figure 2: Aerial view of the international border. The dry area on the lower right is U.S. Customs, while the dry area on the immediate lower left is Canada Customs. The communities of Emerson, Manitoba and Noyes, Minnesota are in the upper portion of the picture, beyond the community of West Lynn. The normal channel of the Red River, outlined by trees, flows right to left in the picture. The line vertically intersecting the trees along the Red River marks the international border. (Photo courtesy of Manitoba Conservation, Water Resources Branch)

felt that the National Weather Service could better serve them by remaining in the American home-offices and providing Manitoba accurate water-level data.

Manitoba also provided resources to North Dakota and Minnesota. The City of Winnipeg, Manitoba offered temporary housing to American evacuees and Manitoba personnel were responsible for closing and monitoring a transnational ring dike protecting Emerson, Manitoba and several buildings in Noyes, Minnesota. Manitoba Hydro, a Canadian utility company, provided equipment, supplies, and man-power to the American utility company Minnkota Power. The cooperation between these two companies illustrates another example in which transnational interaction during routine periods provided the foundation for interaction during disasters.

The request for cross-border assistance came after the two American states suffered severe damage to electric power lines and poles as a result of an early April ice storm. Many houses were left without heat, and pumps that were fighting flood waters around fragile dikes were rendered inoperable. Manitoba Hydro, Minnkota Power, and several other small American utility companies were in the process of establishing mutual aid agreements in the months before the disaster struck. Smaller American electric companies benefit from Manitoba Hydro's size, expertise, and proximity while Manitoba Hydro sells electricity to these companies and relies on some of their power lines to transmit

electricity to states further south. Although the lines Manitoba Hydro relies on were not damaged by the 1997 ice storm, the mutual dependence between these organisations during routine periods led to American dependence after the ice storm and in preparation for the Red River flood.

There were few cases of cross-border planning meetings for decision-making purposes; most flood-response decisions were made independently in each country, albeit based on shared information. Transnational planning did occur, however, in regards to cross-border transportation routes. Continuity of commercial traffic during a disaster is an important consideration, particularly between nations—such as Canada and the United States—that have strong economic ties and trade relationships. In the weeks prior to the 1997 flood, organisations representing highways departments, customs agencies, and large trucking companies from both sides of the international border met to coordinate the rerouting of commercial traffic during the disaster.

These examples demonstrate that facilitating cross-border interaction during routine periods can improve interaction during disasters. Proximity, availability, expertise, and the existence of established relationships can sometimes make assistance from a neighbouring country faster and more efficient than relying on help from adjacent provinces or states. In fact, organisations across the international border may have

a vested interest in the well-being of their foreign counter-parts. In transnational disasters, flood-response issues within an organisation's own jurisdictions take priority; but these same organisations are often willing to assist agencies and departments in the other country as soon as they are able to.

Are agreements in place to guide transnational interaction?

And what about informal interaction?

Formalised agreements were important to the effectiveness of transnational interaction during 1997 Red River flood, but informal interaction was also instrumental to planning and response efforts. Some of the more formalised organisational structures that guided American and Canadian interaction included: planning meetings; transnational boards; written agreements, service contracts, and procedure manuals; and cross-border exercises.

Again, the inter-agency meetings regarding traffic rerouting exemplify how these organisations anticipated the flood's impact and took advantage of what preparation time they had. These formal planning initiatives generally consisted of one or two meetings in which relevant data, procedures, and contact information were shared. Agencies and departments typically did not meet with their cross-border counterparts again during the response phase. Although a debriefing meeting may have proved beneficial to future planning efforts, these organisations also did not meet after the disaster because, according to respondents, they did not encounter any serious coordination problems during the flood and they felt they had other pressing tasks to

address. It appears that once the hazard threat or the emergency has passed, it is a challenge for organisations to find time to meet—especially with foreign counter-parts—to debrief and build on their experiences.

Transnational boards are one way to facilitate cross-border interaction and planning. While meetings generally occur during routine rather than crisis periods, these boards affect the interaction that develops during the disaster. In the Red River Basin, some boards—such as the Prairie Regional Emergency Management Advisory Committee (PREMAC) and the International Joint Commission (IJC)—provide a forum to receive, review, and resolve emergency management issues. Others—such as the International Red River Pollution Board—have formal agreements and guidelines for action. Still others allow for formal discussion and planning on river-related—the Red River Basin Board—and non-river related issues—the Central North American Trade Corridor Association and the Red River Trade Corridor Association.

For boards that are more open in their membership and less stringent about mandatory participation, it is often difficult to maintain equal participation from organisations in both countries. Many respondents reported that they could not afford to spend the time needed to attend non-mandatory meetings during non-crisis times, particularly when they must travel several hours to attend. Several respondents felt that because of time constraints and multiple requests to participate on a variety of boards, they could not commit to regular participation. But because they do not restrict membership

to only a few representatives from each nation, these same boards provided an excellent opportunity for those who could attend to network and establish informal relationships called upon during the Red River flood.

Several formalised cross-border agreements guided Canadian and American emergency response efforts. For example, a 1909 treaty exists between Canada and the United States regarding boundary waters. As a result of this treaty, the IJC was formed in 1909 to resolve water-related disputes. Another important agreement between Canada and the United States, signed in 1986, outlines comprehensive civil emergency planning and management assurances. Articles governed by this agreement include the facilitation of moving evacuees, emergency personnel, material resources, and equipment; the treatment of foreign evacuees; requests for cross-border assistance; charges for assistance; and the structure and mandate of transnational groups—of which PREMAC is one. There are also agreements regulating the maintenance, monitoring, and closure of the cross-border, joint ring-dike surrounding Emerson, Manitoba and Noyes, Minnesota, as well as contracts for airborne gamma snow surveys. Organisations involved in the survey had substantial knowledge of what these documents entailed. In terms of the other agreements, however, only a few of the respondents I interviewed were very familiar with them. Yet this lack of familiarity did not seem to generate problems during the Red River flood, perhaps because the formalised agreements provided an implicit foundation for informal interaction, and these organisations had already established relationships with their counter-parts through routine interactions. Formalised documents and procedures can lead to bureaucracy; in the case of the 1997 flood, however, transnational agreements acted as enabling documents to expedite the emergency response and did not infringe on the ability of organisations to contact their counter-parts across the international border.

Informal interaction was common during the flood response. Border communities shared information about sand-bagging activities, evacuations, and updates they received from their respective country's organisations. Most of the informal interaction involved departments or officials telephoning to seek or provide answers to emergent questions and update each other on the flood's impact. Their informal relationships bolstered the trust



Figure 3: Flooding in Manitoba

they had in their counter-parts and the information these organisations provided.

When standardisation inconsistencies exist

Although Canada and the United States share many similarities in terms of culture, language, and the development of emergency management, there are clear differences in policy and practice that played out during the 1997 flood (Wachtendorf, 2000a).

Canadian and American hydrologists exchanged precipitation and water runoff data; however, organisations in each country calculated their flood predictions independently, each concentrating on the portion of the Red River Basin that falls within its respective jurisdiction and issuing outlooks based on the needs of other departments within their own country. As a general practice, hydrologists discuss their predictions for the international border with their cross-border counterparts and attempt to coordinate their predictions for the border communities of Emerson, Manitoba and Pembina, North Dakota. But sometimes these water-level predictions do not match. When the Red River threatened Grand Forks in April 1997, the National Weather Service justifiably concentrated much of its efforts on predictions for this city. While they did not update communities further north along the Red River during this period, Manitoba updated their own predictions for Emerson. After much of Grand Forks succumbed to the Red River, the National Weather Service increased its projected forecast for Pembina. Manitoba, after careful consideration of the information provided by the United States, opted to maintain its original prediction for the town of Emerson. Consequently, the Manitoban and the American river-level predictions differed by several feet during these periods. Ultimately, each organisation takes responsibility for the impact of its prediction on its own jurisdiction.

Organisations may also find that their structure and responsibilities differ from the agencies they interact with in other countries. In Canada, the Canadian Red Cross maintains registration services and handles donations. In contrast, American Red Cross holds the additional responsibility of providing basic social services, a role carried out by the municipalities in Canada. During the flood, a small number of Americans who evacuated to Manitoba did not know which organisation they were to approach for food, shelter, and



Figure 4: Aerial view of Emerson, Manitoba and Noyes, Minnesota, two communities within the transborder ring-dike. The American area is the lower portion extending downward. Photo courtesy of Manitoba Conservation, Water Resources Branch.

clothing, and consequently experienced some delays in receiving assistance. As another example, the Manitoba Department of Natural Resources, a provincial department, is in charge of tasks in its jurisdiction that are administered by several state and federal organisations in the United States.

The differences between Canadian and American procedures extended beyond these few illustrations:

- Canada uses the metric system while the United States uses U.S. customary units of measurement;
- Manitoba reported water-levels in height-above-sea-level while the American states reported in height-above-river-bed-level;
- the Manitoba Department of Natural Resources reported three predictions: the best estimate as well as the lower and upper deciles (includes the 10% likelihood of the best case scenario based on ideal weather conditions, and the 10% likelihood of the worst case scenario based on adverse weather conditions) while the National Weather Service issued a best estimate prediction;
- Canadian and American connecting roads sometimes had different restrictions regarding allowable weight for commercial traffic.

Interestingly, these differences did not result in many problems during the 1997 flood.

Although some officials felt that these standardisation inconsistencies do not generate confusion, most of the respondents interviewed were cautious regarding the potential for error and expressed a heightened awareness about conversion and communication problems. Because most of these organisations work together

during non-crisis period and routine emergencies, many representatives from these agencies were already familiar with the standardisation inconsistencies and had also taken measures to address their threat to response efforts (Wachtendorf, 2000a). In some cases, it is appropriate to standardise practices across agencies. Other times, particularly when more than one country is involved, standardisation is neither possible nor is it ideal. Before a disaster strikes, organisations must look closely at their own and their neighbouring country's policies and practices, consider how these inconsistencies may cause conflict, confusion, or pose challenges during an emergency, and put in place safeguards to prevent problems from occurring in the future.

What has happened in the Red River Basin since the 1997 flood?

Transnational relationships between emergency response organisations and the structures that guide this interaction are not static. These relationships and structures change over time, often respond to emerging needs of the communities, and shape according to political demand. Since the 1997 flood, many changes have occurred in the Basin that will likely impact transnational interaction in future cross-border disasters.

In the weeks following the 1997 flood, the Canadian and American governments asked the International Joint Commission to form a binational task force to study the causes and effects of the flood and to provide recommendations for reducing and preventing harm from future floods. One of the activities the International Red River Basin Task Force pursued was a partnership with the Global Disaster Information Network (GDIN).

These two groups have worked together since the 1997 flood to develop the Red River Basin Disaster Information Network (RRBDIN). The RRBDIN is an open network of stakeholders in the Basin who participate in online workshops and have access on the network's Internet site—www.emforum.org/redriver/—to data, membership directories, reference material, and meeting schedules.

The International Red River Basin Task Force also held public meetings and commissioned numerous studies and reports on flood-related issues facing communities in Manitoba, North Dakota, and Minnesota. In April 2000, the International Red River Basin Task Force released its final report: *The Next Flood:*

Getting Prepared. In addition to suggesting strategies for individual jurisdictions, this document makes specific recommendations on ways to improve disaster resistance through binational input and coordination.

In December, 1998, the International Flood Mitigation Initiative was launched. This binational project held a series of community meetings over an 18 month period in an effort to facilitate partnerships and collect statements from stakeholders in the region about ways to reduce repetitive disaster losses and move toward effective, long-term disaster prevention and mitigation.

The recommendations put forth by these groups and, perhaps more impor-

tantly, whether or not these suggestions precipitate action will have significant effects on how transnational interaction will manifest itself in the Red River Basin in future disasters.

What about transnational disasters between other countries?

These findings from the 1997 Red River flood provide a useful starting point to understanding transnational disasters. We should remember, however, that because of characteristics particular to this disaster—for example, the close economic and cultural ties between Canada and the United States and the relatively slow-onset of the flood—we may find that when we study other types of disaster

Selected recommendations for transnational interaction in the Red River Basin

Organisations in each county must be able to maintain the ability to make decisions and take responsibility for actions taken within their own jurisdictions.

Organisations should take steps to anticipate and plan for what types of cross-border assistance would be beneficial in an emergency situation, under what circumstances, and how best it could be executed. This planning may involve some cross-border training or the documentation of formalised procedures. Before countries engage in transnational assistance, both sides should consider if such aid is really the best option available.

Organisations should be given support and encouraged to integrate new technologies into their cross-border emergency communications procedures and trained to maximise the benefits of these resources.

Organisations who currently do not interact with cross-border counterparts during a disaster may benefit from transnational board participation. Attendance could generate new networks and point to ways that cross-border interaction would benefit those agencies.

Transnational boards should not unduly impede upon participants' time or other activities. Instead, meetings should be limited in number and goal-focused to maximise participation across agencies and ensure effective planning and networking. In return, participants should be expected to participate in board meetings when they do take place. This involves organisations providing adequate support for them to do so.

Formalised [transnational] agreements, contracts, and manuals need to provide structure while still allowing for flexibility, adaptive emergency response, and informality. When they do so, formal organisational structures can allow for informal interaction and operations to take place simultaneously.

Private and public sector organisations should discuss ways their skills might be transferable across the border in an emergency situation and seek out opportunities where mutual aid is beneficial and appropriate. When cross-border assistance does occur, guides should be provided to the international teams to facilitated requests and help with standardisation problems that may arise.

Standardisation inconsistencies do not necessarily need to lead to problems in disaster response if: 1) the individuals or organisations involved are aware of the inconsistencies; 2) they are also aware of the potential consequences those inconsistencies may cause within and outside of the respective organisation; and 3) they take adequate steps before the disaster to prevent problems in their response.

A more detailed account of these and other recommendations for the Red River Basin can be found in *Interaction Between Canadian and American Governmental and Non-Governmental Organizations During the Red River Flood of 1997*, a report by T. Wachtendorf (2000b), commissioned by the International Joint Commission.

events or coordination between different nations, organisations exhibit quite different transboundary interaction patterns.

Consider organisations in neighbouring countries that do not have the same level of access to technology as Canadian and American organisations, or nations that have unequal access to technology. The presence or absence of cross-border technological models and technology-based communication channels—such as faxes, the internet, email, and satellite systems—would impact a nation's ability to predict a disastrous event, share data transnationally, and communicate with cross-border counterparts. Unequal access by one country to technological models and equipment used for prediction could render the other country more dependent on the technologically advanced country than if access to the technology was equal.

Political conditions within and between the impacted countries would affect how they interact transnationally during a disaster. National security concerns or political fallout might prevent a country from providing complete warning information to other nations regarding the release of hazardous materials into the environment. Canada and the United States have a strong bilateral relationship and consequently cooperate during emergency events. In sharp opposition, countries engaged in political conflict may not provide information or assistance to each other. Governments and other organisations could receive political pressure to assist a neighbouring country in need, or, on the contrary, receive pressure not to aid the adjoining nation and instead invest all resources in its own country's disaster response. Likewise, the political affiliations of the ruling governments could influence the amount and nature of interaction during a disaster or to cross-border disaster planning.

Economic conditions would also impact interaction during a disaster. Nations that rely on each other for trade might have better-established networks and be more willing to assist each other during a disaster than countries that do not have economic ties. In addition, nations and organisations under financial constraints may be less able to provide cross-border assistance and travel allowances for transnational meetings than wealthy or less financially conservative countries.

Demographic characteristics play an instrumental role in the interaction between disaster-impacted countries.

Examples of possible influences include the population size, its density, and its distribution. Countries may show reluctance in assisting some neighbours because of lingering racial, ethnic, or religious prejudice against its citizens. Other population demographics—such as income—could render residents from a region in one country especially vulnerable to the disaster and, therefore, more dependent on the other country.

In addition to technological, political, economic, and demographic conditions, differences in language, culture, ecology, geographic terrain, laws, and immigration policies can influence an organisation's shape, the actions it takes (Hall 1972), and its interaction with other organisations in transnational disasters. Furthermore, the influence of gender, race, and class systems on an organisation's structure impacts its institutional assumptions, expectations, and consequently its actions and interactions (Anderson 1997; Acker 1992). As countries become more globally connected through politics, environmental issues, economics, and technology, the need to understand transnational phenomenon like cross-border interaction during disasters becomes increasingly relevant and pressing. The 1997 Red River flood demonstrates that, despite challenges, successful binational coordination can be achieved under certain conditions. Effective coordination might be more difficult to accomplish between organisations whose routine relationships are notably strained or in countries where the conditions discussed above are quite different than what currently exists in the Red River Basin.

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