Exploring the Boundaries of Crisis Communication:

The case of the 1997 Red River Valley Flood

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Based on an analysis of the Red River Valley flood of 1997, this study seeks to explicate the expansive and intricate nature of crisis communication research. Specifically, the crisis is examined from four perspectives: chaos theory, retrospective sensemaking, crisis communication logistics, and apologia. This case serves as evidence that multiple methods are necessary for building a complete understanding of complex crisis events. Furthermore, the authors argue that it is essential for crisis managers to adapt their interpretive frameworks during crises in order to ascertain the unique nature of each crisis, regardless of their previous experiences with similar crises.

Organizational crisis, natural disasters, community tragedies, and similar cataclysmic events are increasingly powerful social forces. The recall of Firestone Tires has significantly affected Bridgestone Firestone, the Ford Motor Company, the auto industry, and millions of consumers. The recent summer wild fires of Montana and Idaho displaced entire communities, devastated industries and destroyed the homes and property of thousands. The school shooting in Littelton, Colorado, took the lives of 13, forever changed the community, and fundamentally altered perceptions of school security. These and a wide variety of similar crisis events are increasing in magnitude, in frequency, and in scope of impact. In this essay, we examine the highly dynamic and increasingly important area of crisis communication, including the evolving understanding of the role of communication in crisis. We describe four major theoretical perspectives for the examination of crisis. Further, we report on an extensive research program detailing the devastating 1997 North Dakota floods from a variety of perspectives, including issues of risk communication, the role of communication in crisis renewal, and the role of information and the media in crisis.

Our examination and analysis of the 1997 flood is based on a wide array of information collected using a variety of methods. Approximately 50 residents whose homes and property were directly affected by the flood were interviewed. City, county, and state officials who were active in the flood resistance efforts were also interviewed. Media accounts of the flood and a report generated by an interstate and international task force, as well as data from such agencies as the Federal Emergency Management Administration and the Army Corps of Engineers were also examined. These approaches were consistent with our goal of constructing the most comprehensive understanding possible of this seminal event. We argue that this case analysis allows us to identify implications for understanding the communicative aspects of the 1997 flood and the study of crisis communication more generally.

Concepts of Crisis and Communication

As a general principle, crisis related-risk is more pervasive in modern society than ever before. Charles Perrow (1984), for example, argues that crisis is associated with increased technology and modern society's drive to build more things "that can crash, burn and explode" (p.

9). Larger, more complex systems and greater dependence on these systems have also contributed to greater crisis vulnerability. The ability of any single manager to see all aspects of a system and identify unanticipated interactions is reduced proportionate to system size and complexity. Moreover, organizational environments are increasingly dynamic, interrelated, complex, and hostile, enhancing the probabilities of crisis. Globalization and constant technological change are two immutable forces accelerating environmental complexity and creating unforeseen interactions.

Scholars and practitioners increasingly recognize the need to develop a richer understanding of organizational crisis. Two trends are driving this recognition. First, practitioners need more information regarding how best to manage these events. Professional crisis managers, associated primarily with state and local governments, are increasingly called on to reduce the harm and disruptions associated with crises. These practitioners, in turn, are seeking a fuller understanding of the processes of crisis, including the ways in which communication can assist in planning, coordination, uncertainty reduction, forms of support, and crisis mitigation. Second, a small but important effort is underway to see crises from new perspectives. While crisis has almost universally been seen as negative and disruptive, crises are archetypal events fundamentally altering relationships, structures, and belief systems. Crisis removes the assumption of the status quo and creates the opportunity for radical change and readjustment. In fact, a common rhetorical strategy is to characterize an issue as a crisis to create attention, free up resources, and facilitate change.

Crisis is generally defined as a “a specific, unexpected, and non-routine event or series of events that create high levels of uncertainty and threaten or are perceived to threaten” high priority goals” including security of life and property or the general individual or community well being (Seeger, Sellnow, & Ulmer, 1998, p. 233). Crisis creates an immediate set of novel conditions, including high levels of uncertainty about cause, blame and consequences, stress and fear regarding the future, and usually intense media scrutiny. Communication researchers have examined a wide array of crisis events such as the EXXON Valdez oil spill (Sellnow, 1993; Small, 1991; Williams & Treadaway, 1992), plane crashes (Fishman, 1999; Ray, 1999) organizational fires (Seeger & Ulmer, in press), food borne illness (Ulmer & Sellnow, 2000) industrial accidents (Ice,

1991; Seeger & Bolz, 1996;), near bankruptcy and plant closings (Sellnow, 1994) product and service deficiencies and recalls (Benoit & Brinson, 1994; Hearit 1994; Sellnow, Ulmer, & Snider, 1998; Ulmer & Sellnow, 2000), and general accusations of wrongdoing.

The role of communication in crisis and its management has developed concomitant with the expansion of this research. Traditionally, communication was viewed as part of the pubic relations function designed primarily to craft a strategic post-crisis response that reduced or diffused blame and responsibility (Wilcox, Ault, & Agee, 1986). Examinations of the Tylenol poisoning (Benson, 1988) and the Exxon oil spill (Small, 1991), among others, began to reposition crisis communication as an ongoing process rather than as a one-time strategic response (Coombs, 1999). Public relations practitioners have also articulated a more expansive view of crisis communication that includes crisis planning, development of contingencies, risk identification, and crisis avoidance (Allan, 1990; Gonzalez-Herro & Pratt, 1995; Katz, 1987; Lau, 1987; Newsom, Scott, & Turk, 1989). This work, with its emphasis on contingency planning, includes in its view communication as a necessary process of coordination for crisis logistics. Through communication, the various resources necessary for crisis responses are systematically organized in relation to one another. This theme has been expanded by professional crisis management agencies such as the Federal Emergency Management Administration which often views communication broadly as part of the larger crisis logistics function. Communication is associated with coordination of resources (equipment, personnel, and information) to avoid or reduce harm and for coordinating efforts and resources during post-crisis support and recovery. Interest in risk identification and crisis avoidance has also led scholars to an examination of risk communication (Heath, 1995). The assumption is that appropriate communication of risk may lead to mitigating behaviors, such as purchasing of flood insurance or building more storm-resistant structures. Finally, some current efforts examine the role of communication from enactment based perspectives (Sellnow, Seeger & Ulmer, 2001; Seeger & Ulmer, in press). Communication, according to these views, frames the fundamental meaning of crisis events. Crises are novel events associated with high levels of equivocality. Crisis participants must communicate in order to determine the meaning of these events, including

questions of cause, blame, and the ultimate consequences of the crisis. In some cases, crises create unforeseen opportunities and entirely new directions for growth and development.

Theoretical Stances in Crisis Communication

Four theoretical stances are manifest in the crisis communication literature, applied research, apologia, enactment, and chaos theory. Applied research often seeks to "translate scholarship into practice" (Frey, 2000, p. 181). Much of the work in public relations, crisis planning, and crisis teams fits into this orientation. Moreover, many dramatic cases such as the Exxon Valdez and the Challenger explosion have illustrated the practical value of communication in both avoiding crisis and responding successfully. Apologia, or the generic discourse of apology, has generated elaborate taxonomies of post-crisis responses (Benoit, 1995; Coombs, 1999; Hearit, 1995). This work has given researchers a detailed method for the critical examination of post-crisis messages. A third theoretical orientation is grounded in Karl Weick's concept of organizational enactment (Bantz, 1995; Weick, 1979, 1995). Weick's view argues that organizational or systematic equivocality is reduced through processes of communicating various responses or interpretations. Those interpretations that are successful in reducing equivocality are retained. This framework has been used for the examination of the Bhopal Union-Carbide industrial accident (Weick, 1988) and the wild fire disaster in Mann Gulch, Colorado (Weick, 1993). Finally, the framework of chaos theory is beginning to be employed in the examination of organizational crisis (Murphy, 1996). This framework, emphasizing non-linear, non-rational systems, the impact of small variance, absence of predictability, and unanticipated outcomes, has much promise for the examination of crisis (Butz, 1997).

The 1997 Red River Valley Flood

In 1997, the Red River Valley captivated national attention as the region endured its worst flood in more than 100 years. The complexity and impact of this crisis make it a rich case for testing the boundaries of crisis communication. The flood surpassed the capacity of every crisis management plan that was prepared by the communities in the region. Moreover, the destruction of the flood fostered unprecedented study, debate, restructuring, and expenditures, all of which were

based on risk communication. We offer a discussion of this case in an attempt to, at once, explicate the expansive and intricate nature of crisis communication research. Crises such as the Red River Valley flood demonstrate the need for an approach to crisis communication that moves beyond the traditional parameters of image restoration. Viewing crisis as an ongoing process of discovery and renewal is more fitting for a crisis that extends beyond questions of image. Specifically, events such as the Red River Valley flood are so complex that they are best understood from a variety of perspectives. In this section, we first share the story of the flood, and then discuss it from the perspectives of chaos theory, enactment, applied communication logistics, and apologia.

Context of the Flood

As the first signs of spring began to dissolve the winter of 1996-1997, community leaders in cities located along the Red River, dividing Minnesota and North Dakota, had already devoted countless hours to planning and preparation for the certainty of a severe flood. A record-setting snowfall in the region served as an indisputable warning that a flood was inevitable. Flood management had always been a way of life for Red River Valley residents. However, by April of 1997, snow measured 30 inches in area fields—more than twice the normal levels (McEwen, 1997). As this deluge of snow began to melt, water ran through every available channel to the northward flowing Red River. When the tributaries were overwhelmed, miles of standing water in the expansive agricultural fields surrounding the region began to move overland in a steady migration toward the Red River. None of this early flooding caught the city leaders in the Red River Valley by surprise. For three months prior to the spring thaws, city and county leaders had begun planning for severe flooding. What the region's leaders and residents did not know, however, was that the severity would surpass even the most pessimistic predictions.

Those years with high snowfall had traditionally meant hours of sandbagging for many residents along the Red River. Residents living in low-lying areas near the river were required by law to carry flood insurance on their homes. Still, no previous flood of the Red River in modern history had created any more devastation than to sporadically claim those homes that were difficult to

protect. In 1997, however, the region was altered forever by a flood that captured the nation's interest as entire cities, including Grand Forks, North Dakota, with 50,000 residents, were consumed by the Red River. Permanent dikes that had served the cities in the region for as much as 50 years were overwhelmed and washed away in minutes as the waters surged to peak levels. In the end, damage and home buyouts resulting from the Red River flood of 1997 totaled a staggering $5 billion, making it one of the most expensive floods in U.S. history (Gilmour, 2000a).

Crisis and Chaotic Systems

From its initial planning through the flood battle, officials in the Red River Valley continued to utilize the traditional, linear forms of water measurement they had employed for several decades. Despite the magnitude of snow-cover and the unanticipated degree of overland flooding, regional leaders saw no immediate reason to assume that this measurement system would be ineffective. These traditional measurements relied on a series of gauges to provide specific assessments of water depths along the Red River. In retrospect, this traditional approach failed to account for the chaos produced by the overwhelming enormity of the runoff following the rapidly melting record snowpack.

The region's dependence on specific measurement from assorted gauges represents a bias toward "modern science's assumption that single units are microcosms from which the whole system's behavior can be deduced" (Murphy, 1996, p. 99). The traditional measures assumed that a readily apparent and predictable pattern of water flow was evident. As residents would soon discover, this assumption did not account for chaotic aspects of the system. Ice persistently jammed the river, backing up against man-made structures such as bridges and causing flash floods. Huge chunks of floating ice damaged the gauges, leading to inaccurate readings. Heavy rain and widely fluctuating temperatures made efforts to identify a clear pattern of rising water impossible ("Ice Jam," 1997). As a result, the traditional, linear flood prediction techniques fell victim to the following warning inherent in chaos theory: "concentration on individual units can yield insignificant or misleading information" (Murphy, 1996, p. 99). In chaotic circumstances, qualitative measurements such as fractals provide more accurate measures. Fractals account for the "relative

degree of complexity of an object" (Murphy, 1996, p. 100). In short, linear forms of prediction often yield an incomplete view that cannot account for the unpredictable and multi-faceted antecedent forces of crisis.

Early in April, officials using linear forecasting warned residents along the Red River to prepare for flood crests of 38 feet. The 38 feet prediction was considered generous. Residents along the river undertook the task of building sandbag dikes to a level of 38 feet. Residents in low-lying areas had erected such dikes regularly in all high water years. On April 10, neighborhoods along the river were shocked by a revised National Weather Service prediction that the crest would hit between 39 and 39.5 feet, a new record (Gilmour, 1997a). The previous record flood had occurred in 1897 when the Red River crested at 39.1 feet in Fargo (Gilmour, 1997b). Fear turned to relief and frustration when, two days later, the National Weather Service again revised its projection, "from a top height of 39.5 feet to a low of 37.5 feet" due to the discovery of "a faulty automated gauge upriver" (Hilgers, 1997a, p. A1). This error was the first sign that the linear measurement system was not sufficient for the dynamic and evolving disaster. The underlying meaning of the faulty gauge and the series of inaccurate predictions, however, was missed.

City officials complained vehemently to the National Weather Service that, because they were depending on these crest forecasts, such mistakes were intolerable.The U.S. Geological Survey, who monitors the gauges, claimed the faulty reading was an isolated incident (MacDonald, 1997).

By April 14, Fargo's perations manager said it was unlikely that the Red River would crest again in Fargo. An unofficial crest reading of 37.61 feet, the second highest on record, was slowly dropping. The next day, a second major indication that the linear measurement system was insufficient appeared. The Operation manager had based his prediction on what was the second faulty gauge reading in a week. Floodwaters were actually rising and were expected to climb above 38 feet (Hilgers, 1997b). With this second failure, the National Weather Service abandoned its automated gauges. Still, it maintained its linear focus by switching to hourly readings of the manual

gauges that were accessible. Unfortunately, this measurement system inherently lacked the means to account for the chaotic behavior of the floodwaters.

On April 17, the Red River surpassed the 100-year-old record by climbing to 39.12 feet in Fargo. At this point, Fargo's Operation manager, for the first time, made reference to the chaotic situation, "We are at river stages that exceed the 1897 level. No one has ever seen this much water in the Fargo area, ever. All we can do is react" (D. Gilmour, 1997c, p. A1). As the floodwaters exceeded record levels in Fargo, Grand Forks, residents began to feel apprehensive. Grand Forks is located 72 miles north of Fargo along the north-flowing Red River. Seeing the record-setting water levels in Fargo, Grand Forks officials called for a voluntary evacuation of low-lying areas near the river. Grand Forks Mayor said, "It's not a panic situation, but we want each and every person in these areas to be safe"(Condon, 1997a, p. C1). Grand Forks' dikes were built up to 52 feet. The prediction on April 17 was for a crest of up to 50.5 feet. Grand Forks' emergency manager acknowledged the uncertainly of the situation as water levels began to rise. He indicated that he had some concern that the dikes had "never been tested at 50 feet." He admitted equivocally that, "From an engineering standpoint, they're safe. But we have to let the people know we're dealing with an unknown" (Condon, 1997a, p. C1). Grand Forks officials had no guarantee that the predicted crest was accurate.

A sudden shift to warm weather made forecasting crest levels for Grand Forks increasingly erratic. Water rose so quickly that the National Weather Service's forecasts "barely stayed ahead of actual river levels" (Condon, 1997b, p. A10). Water lapped at the top of the Grand Forks dikes as residents scrambled to raise them with sandbags. By April 19, water began topping or penetrating the dikes in Grand Forks and its Minnesota neighbor across the river, East Grand Forks. Ultimately, the flood crested at 54 feet, a full 2 feet above the permanent dikes. Water surged down Grand Forks' and East Grand Forks' streets. Emergency officials evacuated the city as the sewer system was overrun by floodwater—causing the city to flood from within (Condon, 1997c). Circumstances worsened when, within hours of the dikes' failing, a historic part of downtown Grand Forks burst into

flames. Firefighters were powerless to stop the fires that “raced along some of its downtown rooftops” (“Fire Adds Hell”, 1997, p. A7).

Ironically, some residents and Grand Forks officials insisted that the city would not have been lost if the traditional, linear measurements would have been more accurate. The Grand Forks mayor said, “I don’t like to be critical, but we were told absolutely 49 feet by the weather service,” and she insisted that, had the city known how high the waters would rise, the devastation “would have been preventable” (Produs, 1997, p. A1). In his response, one of the forecast officials acknowledged the chaos of the spiraling conditions that led to the flood. The hydrologist in charge of regional forecast center said: “We were dealing with an unprecedented flood and you’re dealing with Mother Nature and you just have to roll with the punches . . . It’s extremely complex and under the circumstances I think we did a very credible job” (Produs, 1997, p. A1). As the debate over inaccurate forecasts and preparation in Grand Forks rambled on, Fargo residents received the grim news that, had temperatures risen more quickly, flood levels would have risen to 42 feet, well beyond the capacity of all existing dikes.

Following the flood, an extensive investigation into the National Weather Service’s forecasting procedures, conducted by the Pioneer Press of St. Paul, MN, yielded no evidence that the agency had “bungled” its crest predictions (“Newspaper: No Evidence,” p. C1). The study found that “government officials worked at the edge of scientific knowledge and made extraordinary efforts—occasionally risking their lives—as they tried to monitor and predict the river’s behavior” (“Newspaper: No Evidence,” p. C1). In the end, Weather Service officials explained that the bridges in Grand Forks created an unanticipated damming effect that forced water levels two feet higher than predicted. The report indicated that the National Weather Service “never suggested its original 49-foot crest prediction was something Grand Forks residents could rely on,” however, the agency did admit that 'forecasters could have stressed the uncertainties of their prediction in stronger terms'” (“Newspaper: No Evidence,” p. C1).

In retrospect, it is clear that the region’s dependence upon a series of gauges to provide crest predictions created a reactive stance. Despite the evidence that this flood would be like no

other in recent history, city officials emphasized only routine procedures. Even as overland flooding began to consume areas that had not been flooded in decades, the region's residents relied on the standard river forecasts. Ironically, even as their property was overtaken by flood waters, some residents and the mayor of Grand Forks still clung to the belief that the destruction could have been prevented if the traditional measurement process would have been conducted properly.

From the perspective of chaos theory, the lesson of the 1997 Red River Valley flood is clear. Routine procedures used to prepare for exceptional events are often dangerously inaccurate. In previous floods, city officials obtained a maximum crest figure from the National Weather Service and prepared accordingly. As such, city officials remained locked into a "certainty seeking mode" (Murphy, 1996, p. 102). In 1997, officials continued this strategy despite the extreme conditions surrounding the flood. Rather than expanding their view to include communication which took into account the variability caused by other contextual factors such as snowpack and temperature fluctuation, officials insisted on obtaining their information, as they had always done, from the National Weather Service's gauge estimates. Had the city officials and residents recognized and accepted the potential for chaos if the situation, it is likely they would have had a more flexible and inclusive plan for both anticipating and preparing for unexpected water levels.

Enactment as Retrospective Sensemaking

It is clear that leadership in the cities of Grand Forks and Fargo engaged in crisis planning and management processes that did not account for the seriousness of the impending flood situation. Weick's (1988, 1995) interpretation of expectations and sensemaking further elucidates the circumstances leading to the city officials' persistent resistance to expanding their focus. Weick (1988) explains that crisis situations impede an organization's sensemaking process by straining its information systems, thus forcing it to attend to fewer elements. In the case of the Red Rive Valley flood, the expectations held by community leaders and residents played a part in constraining sensemaking. The region had endured numerous floods and expected the 1997 event to follow predictable, well-understood patterns. Residents along the river accepted sandbagging as necessary and routine during years when the flooding was serious. The cities constructed

permanent dikes rising well above the crests of previous floods. Residents paid little attention to the dikes as they blended into the parks and green space in the cities. This previous experience with flooding in the valley created a series of expectations among residents preceding the 1997 flood. Ultimately, these expectations hindered, rather than supported, the flood planning process.

Weick (1995) sees expectations as “starting points” for sensemaking because they affect the “information that is selected for processing” (p. 148). The river gauges had always been a sufficient form of data collection during past floods. The expectation among residents was that the gauges would again yield sufficient information for coordinating the flood response. As the flood began, the river rose in a manner that was consistent with previous floods. The apparent normalcy early in the flood created a form of satisficing for both residents and leaders. Weick explains that “if expectations are accurate enough (satisficing), people gain confidence in their situational assessment and treat it as the definition of the situation” (Weick, 1995, p. 146). During the 1997 flood, residents and city officials did as they had always done. They watched the river rise and awaited the final prediction of the highest crest.

Despite the fact that overland flooding was influencing the river in ways never before seen, the cities stuck to their linear measurements and established expectations. Even the fluctuating measurements and failing gauges did not deter this focus. Weick (1995) explains that “sensemaking is as much about plausibility and coherence as it is about accuracy, which is why the heavy hand of expectations can be a blessing as well as a curse” (Weick, 1995, p. 146). The region was blessed with past experiences where the community had successfully endured serious flooding. These success-based expectations were ultimately detrimental to understanding the seriousness of the 1997 event in that they constricted the amount of information considered in forecasting the seriousness of the flood. By the time water levels exceeded expectations, little time was left to react.

As melting accelerated, flood management efforts escalated in both volume and speed. Time constraints intensify in crisis situations. Weick (1995) contends that, in times of extreme equivocality, organizations “cannot afford the luxury of accuracy” (p. 153). He argues that “the costs

of being indecisive frequently outweigh the costs of being wrong" (p. 153). Obviously, the situation in the Red River Valley did not afford city leaders and residents the luxury of time. They needed to acquire the best information possible quickly and act upon it. Even when the river gauges began to malfunction, officials did not expand the range of information they considered. Weick explains that such self-imposed restrictions on information are not unusual in crisis situations. He notes that "time pressure encourages people to seek confirmation of expectancies, to cling to their initial hypotheses, and to prefer a narrative model of thought to one that is paradigmatic and more data driven" (p. 153).

Weick (1995) sees uncertainty as an inherent element of crisis situations. He contends that organizations are largely ineffective when they are unwilling to abandon routine procedures and adapt to crisis situations. Weick observes that many organizations tenaciously justify their routine procedures, even when the crisis is spiraling toward increasingly intense levels. He explains that, ultimately, crises may leave organizations with no choice but to respond to a crisis in novel ways. Weick (1993) describes this process as a collapse of sensemaking resulting in a cosmology episode for people affected by the crisis. A cosmology episode occurs when people suddenly and deeply feel that the universe is no longer a rational, orderly system. What makes such an incident so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together (Weick, 1993). Weick believes that the human reaction to cosmology episodes is illustrated by such statements as "I've never been here before, I have no idea where I am, and I have no idea who can help me." (pp. 634-635).

Cosmology episodes can, in crisis situations, represent the first time individuals fully abandon their previous expectations. The rapid flooding of Grand Forks and the subsequent fire represented a cosmology episode during the 1997 flood. Residents of Grand Forks awoke on the night of April 18 to the sounds of sirens and loudspeakers demanding that they evacuate the city at once (Condon, 1997c). No major city in the region had ever been completely evacuated due to a flood for over a century. The ubiquitous feeling of helplessness in Grand Forks was further intensified when several blocks of downtown Grand Forks burst into flames. Firefighters "were helpless in

streets up to four feet deep water, unable to get equipment to work" ("Fire Adds Hell", 1997, p. A7). The powerlessness of emergency workers and the shock of the sudden collapse of Grand Forks as it succumbed to both fire and water starkly exemplify a cosmology episode.

Through the good fortune of cooler than expected temperatures, Fargo managed to hold back the water from the city and most of its outlying areas. Fargo residents were thrust into a cosmology episode, however, when the city outlined its expanded flood resistance plan. The new plan called for buying entire neighborhoods, demolishing the houses, and building new dikes. This proposal caught some residents completely off guard. One resident who had waged flood battles for decades said:

> The thing that stands out in my mind about the flood the most is when they told us they wanted to buy our house. That was hard. The dikes were down. We had survived. Our neighborhood had survived. We had been praised for having the best dike and flood protection of anybody in the city and then they call us and say they want to take our house away. (personal communication, July, 1999)

This resident continues to live in her home, although only one other house remains on what was once a full city block.

Applied Communication and Crisis Logistics

The shock and trauma of the Red River Valley flood forced severe constraints on the region's capacity to communicate and, thus, coordinate relief. Crisis creates an intense and immediate need for specific and accurate information. The urgency of rising flood crest reports meant residents could not wait for the evening news or morning newspaper. Residents needed to receive information literally while atop the expanded riverbanks fortifying sandbag barriers against the relentless rising water. Moreover, the ascending water disrupted other forms of communication such as newspaper production and, in some cases, the operation of telephones. Interestingly, AM radio stations emerged as the only practical source of information. Residents listened intently around the clock to water level forecasts while building sandbag dikes and patrolling the surfaces of both permanent and temporary earthen dikes. Station managers accepted this summons by

suspending their typical schedule of programs and advertising to allow city officials to broadcast messages at will. Calls for volunteers to provide emergency sandbagging assistance at specific locations were broadcast regularly, allowing for the strategic repositioning of human resources. Residents were encouraged to call the stations and talk with the host to share information and sandbagging advice. One Fargo resident whose home was in one of the areas hardest hit by the flooding offered this comparison between radio coverage and other media resources:

> It actually seems to me the best communication was that radio station. It really was on top of things I felt. That's the station that we had on all the time. And of course, what was in the paper and all, and the flood predictions were wrong**.** Nature didn't do what it was supposed to do. But [the radio] was what we listened to all of the time. (personal communication, June, 1999)

Unlike the newspapers and television stations, radio stations in the region were not forced to build their coverage around National Weather Service predictions. Instead, they were able to provide timely information and live broadcasts from residents calling into the stations. Residents were able to describe the unanticipated rises in the river long before city officials and the National Weather Service confirmed them. The value of this spontaneous and continuous coverage was not unnoticed in the radio industry. The AM radio station in Fargo that dedicated itself to constant flood coverage earned a Peabody Award for its dedication to community service (Hindman & Coyle, 1999).

The practicality and importance of radio broadcasts were sadly apparent in a small community near Fargo. The town's only radio station lost power hours before the river unexpectedly overwhelmed a nearby permanent dike. One resident described the near disastrous consequences:

> One of the things that happened is we lost our local radio station during the ice storm. We were without power and they didn't have a generating system. Since that time, they're putting in a generating system. They're getting it so things can be used. But losing that communication even just before the flood, the city was trying to put out the word for people to evacuate. And it didn't work . . . Some of the people couldn't get phone calls, because their own phone needed electricity. [Fargo's radio station] was so busy interviewing people

> that they didn't get the evacuation message over the air. (personal communication, June, 1999)

Although no lives were lost in this community, many residents failed to evacuate before they were surrounded by floodwater. National Guard troops were forced to evacuate some residents from this community and the surrounding farms using heavy machinery and boats.

As the water began to subside from the ravaged communities, thousands of people were temporarily displaced. Evacuees retreated in all directions to shelters, temporary residencies, and the homes of friends or relatives. This scattered configuration of the population made normal communication impossible. Again, radio served as a primary means of connecting people. Local stations broadcast emergency appeals for displaced residents to contact parties who needed to connect with them. Names of residents who were considered missing were broadcast with appeals for the missing persons or people who had seen them recently to contact friends or family.

The newspaper in Grand Forks also served as a primary means of sharing information as the city began to reclaim its homes and streets. The Grand Forks Herald earned a Pulitzer Prize for its unwavering commitment to publish despite the fact that its office and press were destroyed in the fire that erupted as the city was flooded. The paper also printed the names of missing residents and offered instruction on how and when residents could return to their homes. Many residents commented that the newspaper allowed them to maintain some feeling of community despite the evacuation.

Apologia

Following the flood, residents were astonished at how far the devastation exceeded their expectations. The myriad of failures to anticipate and prepare for the crisis warranted some form of apologia by leaders at every level. However, the complexity of the crisis made singling out particular individuals or agencies for blame unfeasible. The National Weather Service was blamed by some city officials, however, the circumstances of the crisis absolved the agency of irresponsibility or incompetence. City officials were severely criticized by some residents, but the volatility of the weather made accurate predictions impossible. Conflicts also formed as residents from Minnesota

and North Dakota blamed each other for taking steps that intensified flooding. Canadian officials were also critical of U.S. policies. More generally, however, the floods were widely seen as an act of God that was largely beyond both understanding and control.

Ultimately, the impending threat of another flood forced officials on every level to suspended their accusations and to rededicate themselves to what Benoit (1995, 1997) calls corrective action. Benoit (1997) explains that corrective action "can take the form of restoring the state of affairs existing before the offensive action, and/or promising to prevent the recurrence of the offensive act" (p. 181). It is important to note, however, that corrective action can and often does occur without the acceptance of blame for a crisis (Sellnow et al., 1998). In natural disasters such as floods, merely returning to the state of affairs that were in place prior to the crisis is usually undesirable. Instead, the community must either dissolve or consider what corrections could reduce the risk of similar damage in the future.

Without accepting blame, the relevant parties in the Red River Valley took the first step in forging a cooperative agreement designed to reduce the potential for such devastation to reoccur. Officials from Minnesota, North Dakota, South Dakota, and Canada formed the International Red River Basin Task force in hopes of resolving the confusion and resentment resulting from the flood. This task force represented an opportunity for unprecedented cooperation among governing officials in the region. The task force, whose charge was to recommend corrective actions, allowed residents to shift their focus from retrospect to anticipation. This shift is particularly advisable in crises such as natural disasters where the catalyst for the crisis exceeds human activity. As was discussed above, crises have the potential to remove the assumption of the status quo and to create opportunities for radical change. This transformation resides to a large extent in the communication surrounding the crises. Crises allow for the appropriate communication of risk that may foster mitigating behaviors. As such, the apologia process may reveal unforeseen opportunities for cooperation and correction that lead to resolution and growth. This focus on corrective action is clearly evident in the post-crisis communication regarding the 1997 Red River Valley Flood.

Fargo's mayor adopted a proactive and corrective approach almost immediately after the flood waters subsided. He argued that the city should pass on commemorating the anguish and drama of the 1997 flood. The mayor argued, "The flood's over. It's no longer an excuse. So don't use that excuse. . . It's a done deal. Move on instead of keep bringing it up [sic]" (personal communication, June 28, 1999). He placed his focus on preparing for "the next disaster relief" (personal communication, June 28, 1999). The mayor or Moorhead also responded to the flood with a call for cooperation and correction. Even before the waters fully subsided, Moorhead's mayor called for a coordinated effort to prepare for future flooding. He said "our topography makes it very complicated, our political boundaries make it very complicated. We not only have three states; we have two countries" (personal communication, July, 1999). Moorhead's mayor insisted that any future success in battling the Red River would require cooperation among multiple governments and agencies. He explained, "we don't have one ounce of statutory authority so all we can do is try and reach some consensus and understanding with your neighbors about [flood management] and hope that your neighbors will act accordingly" (personal communication, July, 1999).

Although each city and neighborhood affected by the flood engaged in some form of retrospective accusations of blame, the systematic influences on the Red River, stemming hundreds of miles, inevitably made such provincial communication pointless. Instead, the task force emerged as a credible resource for coordinating apologetic discourse. The goal of this task force was to "examine ways to reduce future flood damage" (Gilmour, 2000b, p. B1). The task force studied flood "battles lost and battles won" in the region for three years, releasing its preliminary report on the third anniversary of the devastation in Grand Forks (Gilmour, 2000a, p. C3). The report constituted a unified and credible form of risk communication. Rather than offering quick fixes, Canadian co-chair of the task force, Bruce Rawson, said the report emphasized the risk of future flooding, "It's only a question of when. That's why the report is titled 'The Next Flood: Getting Prepared.' Flooding is going to come back. It's inevitable" (Gilmour, 2000a, p. C3). The conclusions and recommendations of the report emphasized further coordination, improved communication, and expanded measurement capacity.

Foremost, the task force report emphasized coordination. Each city in the Red River Valley was advised to “increase flood protection and preparedness, keeping in mind how each city’s actions will affect others along the river” (Gilmour, 2000b, p. B1). In presenting the report, International Joint Commission Chairman Thomas Baldini urged “people to build on the trans-border relationships which developed after the 1997 flood” (Gilmour, 2000b, p. B1). Conversely, the report called for “lowering troublesome dikes “ that “worsened local flooding and strained U.S.-Canadian relations” (Gilmour, 2000a, p. C3). The report further advocated that any future planning include consideration of its eventual impact on farmsteads and small communities.

Much of the tangible coordination advocated by the task force made improved communication essential. This fact was evident in the task force’s overall philosophy as stated by Gerald Galloway, International Joint Commission secretary for the U.S. Section. Rather than advising communities on how to deal with flooding, Galloway said, “We’re encouraging them to consider the problem seriously and work together to arrive at solutions” (Gilmour, 2000b, p. B1). This emphasis on communication spanned nearly all of the report’s conclusions.

Communication was particularly evident in the report’s recommendations related to predicting future floods. The task force recommended that communities “improve and maintain networks for sharing flood information. Computer models developed since 1997 can—and should—be used to prevent future flooding” (Gilmour, 2000a, p. C3). The report also called for one group to serve as a resource for collecting and monitoring flood information so that the information could be shared in a thorough and efficient manner. Enhanced communication would be necessary, in part, because the report advocates a more comprehensive approach to monitoring potential floodwater in the region. Specifically, the report recommends that “in the long term, government agencies responsible for flood forecasting and mitigation should develop “basin-wide models rather than separate but coordinated models for each country” (Gilmour, 2000b, p. B1). This inclusive, systematic form of measurement and prediction would have given city officials a far more accurate understanding of the 1997 flood’s potential. The linear forms of measuring levels of water

downstream simply failed to account for the miles of pooling water on either side of the river that was slowly oozing toward it.

At present, the report stands as the most unified effort to explain, predict, and control flooding in the Red River Valley. Rather than focusing on failures and blame, the report calls for enhanced coordination to correct problems that exacerbated the flood's impact. The report supports its call for corrective action by emphasizing the constant risk of similar or more severe floods in the region. Ultimately, the 1997 disaster has the potential to foster enhanced coordination, communication, and measurement procedures. Had the 1997 crisis not occurred, many of these improvements would not or could not have been considered.

Discussion and Conclusions

The 1997 Red River Valley flood illustrates several features of crisis as a domain of communication inquiry. First, multiple methods are necessary for building a complete understanding of these broad-based, complex, and dynamic events. Only with such approaches can the important interactive features of crisis be clarified. In the case of the Red River floods, chaotic aspects of the system profoundly complicated the logistics of the crisis mitigation efforts and the nature of the post-crisis apology. Chaos enhanced the need for timely information and new sensemaking structures. The inadequacy of the established sensemaking structures reduced the ability of residents to make sense of this crisis, and communicate and coordinate their responses. The apologetic phase of the crisis similarly required the construction of new, more complex and coordinated understandings of the Red River system and concomitant sensemaking devices as residents struggled to clean up, rebuild, and sort out the meanings of the devastation. Communication scholars, who are by nature interested in interaction, are well positioned to examine the dynamics of crisis events.

Second, the Red River Valley flood of 1997 illustrates the need to bring new, much more sophisticated and flexible understandings of crisis to these events. Traditionally, crisis has been framed as inherently and overwhelmingly threatening, destructive, and devastating. Usually, crisis is framed by apologia as an accident, something beyond the control of decision-makers, and often

simply as an act of God, with a logic and purpose beyond understanding. Within this flood episode, however, may be found important positive outcomes. Floods, as with other natural disasters, are often forces of renewal. In this case, the Red River flood created the opportunity to rethink prediction and mitigation technologies, including the way warnings are offered. Moreover, significant areas of Grand Forks were destroyed, creating opportunities to rebuild in new, revitalized ways. In this case, the crisis removed the assumption of the status quo and created the opportunity for radical change and renewal. Chaos theory suggests that crisis may be a necessary cyclical stage in a process leading to reorganization and renewal (Seeger, et al., 1998). Moreover, the floods also created a more complex and elaborate understanding of the Red River system, its relationship to man-made structures, the level of risk it represents, and the inherent chaos in such a system. This new understanding may allow residents of the Red River Valley to benefit from viewing the river that bisects their communities with a heightened awareness of its equiviocal nature.

A third conclusion concerns the importance of meaning and meaning construction during crises. Ironically, it was the community's historic success in fighting and containing the floods that limited the ability of residents to see this flood event in a new and dynamic way. Interestingly, this same phenomenon was identified as an important factor in the NASA Challenger tragedy (Gouran, Hirokawa & Martz, 1986). One meaning and set of concomitant expectations and enactments, therefore, may impede the emergence of new understandings and responses when they are most needed. New, more adaptive responses could only emerge when the inadequacies of the established meaning(s) were demonstrated in dramatic and costly ways. The new understandings of flood-related risks in the Red River Valley, however, seem to include a much more realistic grasp of the inherent uncertainty in the river system.

The probabilities suggest that more crises will erupt and that these events will have even broader affects. Projections regarding global warming, for example, suggest that widespread flooding will become much more common in the ensuing decades. Hurricanes and earthquakes continue to take the lives of thousands, destroying billions of dollars in property and changing the destiny of entire regions. These events will seriously stress existing crisis planning,

communication, and response capabilities, and require more complex and flexible understandings of these important events. Future studies focused on communication's role in advancing the sensitivity and the capacity to respond to equivocal messages in crisis situations of all sorts, therefore, are warranted. Such investigations must take a broad view of these events from a variety of methodological, temporal, critical, and applied stances. Viewing crisis communication merely as a retrospective process for rekindling the status quo fails to account for the multifaceted role of communication in crisis planning and recovery. Moreover, such views may deny both victims and potential victims the understandings necessary to deal more successfully with these powerful events.

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