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THE ST. LOUIS FLOOD: SOME OBSERVATIONS ON WARNING AND PRE-IMPACT DISASTER RESPONSE

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Objective

During the latter part of March continuing to the end of April 1973, three flood crests on the Mississippi River caused property damage and disruption in three counties surrounding St. Louis, Missouri and, to some extent, in the city itself. While press reports seemed to indicate that the actual impact on the city was not major, there did appear to be a mobilization of organizations in the city in preparation for and response to such an event. On the basis of press reports and other information, the Disaster Research Center (DRC) sent a two-man field team to St. Louis. The team stayed two days, May 3 and 4, concentrating on flood-associated activities in St. Louis and the three surrounding counties and attempting to get answers to the following questions:

(1) If a disaster had occurred, in what way was the community response coordinated in two emergency task areas: warning and pre-impact activities;

(2) What role did the local civil defense (CD) organization play in the coordination of warning and pre-impact activities;

(3) Did the flood situation and/or the CD flood activities have any effect on how the community and the community organizations viewed CD's saliency and legitimacy as a viable emergency organization?

The third question was asked in connection with a DRC study of CD saliency and legitimacy, i.e., the extent to which CD was a "visible" organization and the extent to which it was a viable emergency coordinating organization within the community. The local CD in the St. Louis area had been studied by DRC previously. Consequently, we had a rather clear picture of CD's position (in terms of the two variables) in the St. Louis community in pre-disaster times. Thus, we could evaluate the changes (if any) occurring in the variables and perhaps locate the causes of such change in the flood situation or in CD activities during this period. However, an accurate determination of such change can only result from a follow-up study of the St. Louis CD organization since we assume that some amount of time must pass for any such changes to become readily visible.

Field Work

The field team contacted officials in the following organizations:

1. St. Louis Planning and Coordination Office (City CD)
2. St. Louis County Civil Defense
3. Denver Regional Civil Defense Office
4. St. Louis Mayor's Office
5. Public Services Division (equivalent to a department of public works in an expanded form since it includes engineers from several different task areas)
6. City Police Department
7. Red Cross

8. Army Corps of Engineers
9. National Weather Service
10. Coast Guard

Since the major flood episode in St. Louis occurred in an area of split political jurisdiction (i.e., city and county), we interviewed in both the county and city CD offices. These are separate organizations though they have a written mutual-aid agreement which allows the shifting of resources from one to the other. The emphasis in the study was on flood activity in St. Louis. Nevertheless, we contacted several organizations whose primary flood activities occurred outside the city. (They, however, had engaged in some in-city activities.) This gave us an outside perspective on city flood activities as well as some comparison on how flood-related actions were conducted in the surrounding area.

We received excellent cooperation from both city and non-city officials. The interviewing took place at a time when the major flood threat had lessened, thus allowing officials ample time to be interviewed. Also, since the flood response by various organizations had in general been viewed as effective, we did not enter a situation in which there was much controversy or recrimination, and, therefore, most people were more than willing to reconstruct their flood-related actions.

The Nature of the Threat

The city of St. Louis is protected from high water on the Mississippi and Missouri Rivers by its location on a bluff and by a 10-mile long flood wall encircling it. Aside from the temporary closing of a number of floating restaurants and amusements and the interruption of barge traffic, the only effect of the high water on the city was restricted to a small residential area on the south side of the city bordering the River des Peres Drainage Channel. While the flooding in this area was serious for those affected, including forty families who had to leave their homes (and eventually the flood triggered an organized effort to protect the area from rising waters), the overall picture clearly was that there was no disruption of community functioning in the city. It seems there was never any doubt among those we interviewed that the city itself would be protected by the flood wall. Consequently there was no community-wide warning or pre-impact activity. Outside the city, isolated and sparsely populated farm lands were affected. There was property damage to some farms and small towns and evacuation of residents of these exposed areas. However, the major damage seems to have been in relation to the disruption of normal farming activities which may have some later disheartening effects on the agricultural economy of the area.

Our data pertain primarily to the River des Peres location. It borders the southern part of St. Louis and part of the area flooded is located in the county. It serves as a sewage drainage channel accepting the effluent of one large sewage treatment plant and the runoff of a large storm sewer system. As the Mississippi rose to a second crest (the first caused no damage and little alarm) of 38 feet on April 6, the River des Peres overflowed its banks and backed up the sewer

system of the area. This crest was almost totally responsible for any destruction of property within the city, and for the evacuation of some forty families. The third and last crest of about 43.5 feet occurring on April 28 caused little damage to the previously innundated area as a result of an earthen dam built to secure the area in preparation for the third crest.

In the next two sections we will suggest that the major reason for the effective action in the second case and the lack thereof in the first was probably due to (1) high sensitivity to disaster probabilities and (2) high coordination of warning and prepatory actions in the second case and the low sensitivity and low coordination in the first case. However, we will not contend that high coordination leads directly to effective response since from the data we can not logically rule out the possibility that high sensitivity and uncoordinated collective response would have been just as effective. The flood was a diffuse phenomenon with spotted mini-disaster areas throughout the region. Perhaps very localized and specific coordination is more appropriate in such cases.

Warning and Pre-Impact Activities for the Second Crest

Our data from the organizations contacted suggest the following picture: (1) There was a general lack of awareness among city organizations of the potential flood threat along the River des Peres (pre-second crest); and (2) After the threat became reality, there was slow development of an organized response.

Results of a questionnaire administered in the summer of 1972 showed that the major emergency-relevant organizations in St. Louis rated the probability of flooding as only low to moderate. This result was supported by the impression of the field team on the recent trip. A partial explanation for the low flood sensitivity offered by many respondents is the psychological security provided by the flood wall, and the fact that no recent major flooding has occurred.

Coupled with this low sensitivity was the somewhat low-keyed forecast provided by the National Weather Service in St. Louis. Consequently, it is not surprising that three of the first organizations to learn of the threat -- CD, police, and the public services division of the city -- were informed independently by residents of the affected area. Warning to other relevant organizations was extended at a meeting called by city CD on March 29, 1973 at the CD office. Representatives from the mayor's office, army corps of engineers, street department, public safety department, fire department, police department, welfare department, Red Cross, health department, department of human relations, Coast Guard, the metropolitan sewer district, various utilities, et al. attended this meeting. All organizations were informed of the flood threat by CD and corps of engineer officials, but no overall coordinated effort was suggested.

This is not intended to imply that all these organizations were unaware of the situation. Many had acted independently. The street department was supplying sand to residents, the police were directing traffic around impassable streets, and the public services division had been trying to predict high water marks in the area. The major preparatory activity to this point though was clearly

characterized by individuals and small groups of neighbors constructing sand bag levies around their homes.

Not until a major portion of the area which was eventually to be inundated had already been affected was an attempt made to coordinate the effort. On April 2, 1973, the mayor called a meeting to organize the effort. While memories are vague on who attended, it seems that roughly the same organizations represented at the earlier meeting were present, only represented by higher officials in some cases. The meeting resulted in the president of the public services division and the director of the street department of the city being appointed in charge of operations at the disaster area with authority to act in the name of the mayor. On the county side of River des Peres, the local county CD director also became more actively involved, setting up and directing an operations center on the county side of the river. The city CD director was appointed disaster coordinator with the responsibility of assisting the directors of operations. Also the meeting resulted in an on-site command post being established in the River des Peres area. As can be seen, then, two command posts were set up in the area. However, several informants noted that there was little friction between the two. They also noted that few resources were exchanged with the exception of volunteers. It was also during this time that a state of emergency was declared and the National Guard was called in.

Warning and Pre-Impact Activities for the Third Crest

In contrast to the second crest where warning traveled from individuals to organizations and then to other organizations, the general picture for the third crest was that warning traveled from organizations to other organizations and then down to individuals. On April 21, 1973, the National Weather Service wire in St. Louis carried a forecast for a crest to pass the city in about a week which would be higher than the one from which recovery operations were still continuing. In response, a small informal meeting was held the same day at the street department garage. The meeting was apparently called by the two city operations directors and was attended by representatives of at least the metropolitan sewer district and the city CD. It was decided that an earthen levy would be constructed to protect the major portion of the area that had been flooded during the second crest.

A second warning phase (after the dike was built and in fact holding back the water) resulted from a concern apparently initiated by the CD director, that a flash flood might result from a break in the dike. To warn the residents of the area, the police went door-to-door to leave the message that should a break occur they would sound their sirens. The Red Cross was asked to establish additional shelters in case they were needed by flash flood victims. The Coast Guard was to have standby boats ready and members of the Civil Air Patrol were called in to patrol the dike on foot in order to give an early indication of dike erosion. There is agreement that the warning procedure was engineered and coordinated by the city CD. Actual operations control at the on-site command post was in the hands of the two men appointed by the mayor. The mayor's office was practically uninvolved in direct supervision due, in part, no doubt, to the change of administrations on April 17, 1973.

It should be noted that the organizational richness of St. Louis seems to have been a highly facilitative factor in the effective response to the third crest. There are simply a great number of flood-relevant organizations located in the St. Louis area.

As mentioned previously, it seems apparent that the more effective response to the third crest was due to increased flood sensitivity and/or more coordinated action. This general appraisal is substantiated by non-city organizational respondents. That is, these respondents generally noted a more effective response, more coordination, and higher sensitivity not only in St. Louis but in small towns and villages outside of St. Louis during the third crest vis a vis the second crest.

The Effect on CD

The saliency and legitimacy of the CD office in St. Louis is variable. As the CD director sees it, other emergency organizations are aware of the existence of CD, see a need for it, and view it positively, while on the other hand there is a group of older men who are actively trying to abolish the office and use the funds otherwise. The county CD office is in a still more tenuous position. Personnel reductions in the past few years have reduced the total staff to three people. A regional CD officer noted that there was some doubt prior to the flood as to the continuance of anything but a "token" organization. The impression of the field team is that these views of the two organizations are basically accurate. Even those who view either organization positively are more certain about the need and value of the office in general than they are about the performance of the particular offices which exist. And since St. Louis has been rather disaster-free since the late 1950s, there has been no opportunity to demonstrate the competence of the CD offices.

Indicative of the ambiguity of city CDs position is that in January 1973 they were given a new and larger office nearer the seat of city government to move into and establish an Emergency Operations Center. This was a move the organization had worked hard for in previous years. However, the centralized communications network linking CD and many city and private organizations together which CD had requested was downgraded in priority by simply funding a study for such a proposal. The CD's budget was narrowly passed during the flood (after the second crest). This was perhaps an opportune time since the budget was in jeopardy of being disastrously reduced. As it was, no reductions occurred. Because of the time of our study, we cannot know for certain what effects the flooding and response will have on civil defense in St. Louis in the long run. There are, however, a number of reasons to believe that the consequences for the saliency and legitimacy of civil defense will be positive. One such reason is, of course, that city CD's budget was passed in the form requested by CD. Also, the new budget allows the CD director to appoint a communications officer who will attempt to institute a more sophisticated communications network.

It might reasonably be expected that sensitivity to flood threat might be heightened in the future. While there is no necessary connection between high

disaster sensitivity and high CD legitimacy, the Disaster Research Center has found there generally is such a relationship. The nature of the press coverage of the flood is expected to somewhat positively enhance the conception of CD in the community at large. However, CD was not the only organization which received fairly favorable press treatment. There was no centralized news dispersal point; consequently information was obtained from many sources and also identified these sources. Since this was the case, one can expect other organizations (especially the Army Corps of Engineers) to somewhat deflate the image of CD as the only disaster organization in the area. Nevertheless the CD director (the city more so than the county) did broadcast appeals for volunteers and did issue warnings and other messages. We would expect, therefore, that such flood visibility will carry-over to some extent in the future.

There was practically unanimity among respondents that the actual performance of CD will boost their legitimacy position. In general, persons from other organizations felt CD proved it could deliver by bringing in help from other governmental levels such as the Army, Coast Guard, and Civil Air Patrol, and that it could actually coordinate an effort such as the warning for the possible flash flood. It is important to keep in mind that the civil defense office was not the center of activity and the CD director was not located at the on-site command post where many decisions were made (although the assistant to the director spent much of his time there). Nevertheless, while city civil defense was not directly in the mainstream of operational activities, the office did help where it could by thinking of possible problems and by attempting to coordinate activities -- primarily by acting as resource people. The county CD director, however, was more of an operations person, perhaps due to his more limited access to other organizational resources. Again it must be emphasized that the city was really more "in charge" of the River des Peres flood response and therefore it perhaps was appropriate that the county CD director should act less as a coordinating person.

Summary of Observations

In general we found that higher sensitivity and/or higher coordination was associated with a more effective flood response. Also, it appears that CD, especially city CD, was active in the flood response and did to some extent coordinate activities. In general, however, it must be noted that the appraisal of CD effectiveness was somewhat lower from non-city organizational respondents vis a vis in-city organizational respondents. Also it is our expectation that CD's saliency and legitimacy will probably improve somewhat due to its press exposure and fairly favorable effectiveness appraisals from other organizations. However, noting the rather "minor" nature of the flooding, the diffuse nature of the flood, and the non-centralized news dispersal point which meant that many organizations were given press exposure, we do not expect a "large" change in the CD saliency and legitimacy variables, although such changes as will occur will almost certainly be in a positive direction.

One concluding observation, though tangential to the emphasis of this study, seems appropriate. We observed the tendency in several respondents to assume

that technological knowledge and its implications was readily understood and acted upon by both individuals and organizations. For example, one respondent assumed that all homeowners would know the elevation of their property, and since there existed topographical maps which predicted flood areas whevever the river reaches certain flood heights, the homeowners would put two and two together and figure out when their property would be endangered. This perhaps can be termed the "folk rationality myth." It seems presumptious that an organization could hold such a view and the consequence of such a view, since most homeowners did not put two and two together, is possible disaster if this technological information is not fed from organization to organization and then to specifically endangered homeowners.