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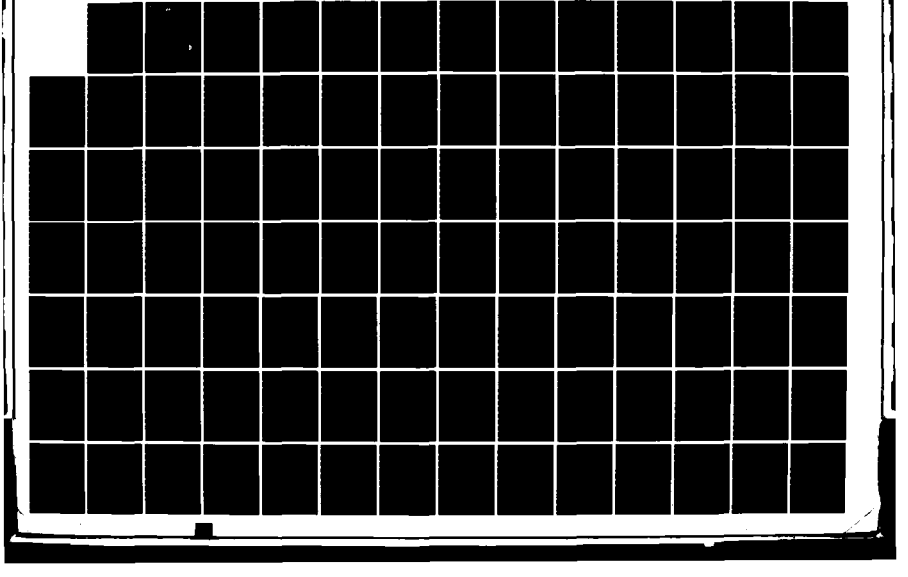

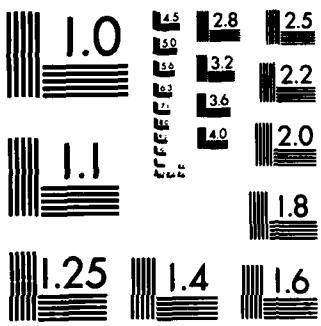

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Human Costs of Flooding the 1979 "Easter" Flood at Jackson, Mississippi

IWR Special Study for the Mobile District

April 1984

Reimbursable Study 84-RS-3

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This IWR support study at the request of the Mobile District is an estimate of human damages (as distinct from property), based on the psychological trauma effects of flooding. Floods distort or interrupt the normal states of the individual and the family. The psychological and behavioral effects of a flood that harm and impair the person can be and are defacto, "priced" in both legal (e.g. Buffalo Creek) and technical (American Medical Association & Veteran's Admin.) procedures as dysfunctional to society in the entitlements or social maintenance cost senses implied by NED "theory." The report contains an (over)

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20. Abstract (con't)
estimation of the monetized "human" costs of flooding on the Pearl River at Jackson, MS. It also provides a comparative base in the Tug Fork (WV) and Lake Elsinore (CA) cases so that the reader may assess the results for Jackson in an empirical context.

HUMAN COSTS OF FLOODING:

THE 1979 "EASTER" FLOOD

AT

JACKSON, MISSISSIPPI

Prepared

for the

Mobile District

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and Kevin A. Alexander

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INTRODUCTION

This IWR support study at the request of the Mobile District is an estimate of human costs based on the psychological effects of flooding. It was first used in a 1980 IWR study of a flood in the Tug Fork Valley of West Virginia and Kentucky, for the Huntington District. In that prototype study contractors at Cornell University, in departments of economics and sociology, were tasked to design items, and develop a methodology which would provide an empirical estimate of the "human costs" due to flooding. This concept had been developed earlier as "behavioral damages", in a narrative, unquantified conceptualization in the St. Paul District for the Lower Sheyenne Valley study.

Floods distort and or interrupt the individual's and family's normal state and productive activities. The psychological and behavioral consequences of a flood which both hurt and impair the person can be and are, defacto, "priced" in both legal (e.g. Buffalo Creek) and technical ((American Medical Association (AMA)), and ((Veteran's Administrative (VA)) proceedings as dysfunctional to society in the productive sense implied by NED "theory". Therefore, they can be used as an orthodox contribution in benefit cost analysis. Damages to property and damages to people which can be avoided by flood control measures are identical in logic as measures of benefits, for there is a loss of resources to the nation in both.

Since the Tug Fork Planning Support Study, this basic idea of damage estimation due to the impairment of people was used a second time by Antle and Simpkins at the request of the Los Angeles District, in support of its Lake Elsinore study. In both the Tug Fork and Lake Elsinore cases the human costs

were considerable in proportion to damages to residential property and contents. In both cases, the relatively low market value of residential housing limits property and contents damages.

The operational steps of the "human costs of flooding" methodology are carefully shown and discussed in Appendix A of the present study. They are based on survey responses which indicate symptoms of human impairment. The symptoms are indexed to conform with the AMA index used to measure functional impairment of the "whole person". The indexed indicators of impairment are then matched with the VA's disability compensation scale for impairment. This provides a monetary estimate of the human costs of flooding.

A summary of the human costs of flooding at Jackson follows. It also provides a comparative basis in the Tug Fork and the Lake Elsinore cases so that the reader may assess the results for Jackson in an empirical context. The wider data and theory base for the human costs methodology is inclosed in the bibliography of Appendix B, provided by Dr. Mary Lysart of the National Institute for Mental Health. Finally, the sampling strategy and operations and the research instruments used in the field are provided in Appendices C and D, respectively.

PART I

SUMMARY OF HUMAN COST FLOODING FOR JACKSON, MISSISSIPPI, BASED ON THE 1979 EASTER FLOOD

SUMMARY OF HUMAN COSTS OF FLOODING ESTIMATE FOR

JACKSON, MISSISSIPPI, BASED ON THE 1979 EASTER FLOOD

Each response in the post 1979 Flood Survey[1] was scored on 20 AMA - comparable symptom indicators of traumatic experience. The sum of the scores (maximum is 20) for each response was then computed for each household. For this survey, the majority of the cases fell into the middle range of the trauma scale. As was done in the Tug Fork report[2], the trauma scale is empirically divided into three classes: (1) limited trauma damage (2) moderate trauma damage and (3) severe trauma damage. Table I-1 shows the results of this division of the cases.

TABLE I-1
TRAUMA SCORE CLASSIFICATION
JACKSON, MISSISSIPPI
DAMAGE SURVEY FOLLOWING 1979 EASTER FLOOD

Trauma Score	No. of Cases	Frequency (percent)
1-8 (Class I)	82	15.8
9-12 (Class II)	338	65.3
13-20 (Class III)	98	18.9

[1] An Impact Assessment of the 1979 Easter Flood on Residential, Commercial and Industrial Structures in Jackson Mississippi (1982), Center for Agricultural Sciences, Louisiana State University.

[2] "Human Costs Assessment, The Impacts of Flooding and Nonstructural Solutions, "Phase I, General Design Memorandum, Tug Fork Flood Damage Reduction Plan (April 1980), Prepared by: Lloyd G. Antle and Charles E. Simpkins, et al, U.S. Army Corps of Engineers, Institute for Water Resources.

Since two other human cost of flooding studies have been conducted it is enlightening to compare the three situations. Each of the communities have significantly different flooding conditions (velocity, depth, duration, debris transport, etc.), land use, socio-economic, and historic characteristics of flood plain occupants. The results at Jackson correspond with inferred expectations based on these attributes. A significantly higher percentage of the trauma scores are in the middle range and fewer are in the severe trauma effects class, than was true in the more volatile flood in the Tug Fork Valley. Table I-2 compares the percentage of individuals in each trauma effects class in the three studies.

TABLE I-2
COMPARISON OF PERCENTAGE OF INDIVIDUALS IN EACH TRAUMA EFFECT CLASS
TUG FORK, LAKE ELSINORE, AND JACKSON

	I	II	III
TUG FORK, WEST VIRGINIA AND KENTUCKY	30.0%	41.0%	29.0%
LAKE ELSINORE, CALIFORNIA	24.6%	56.4%	19.0%
JACKSON, MISSISSIPPI	15.8%	65.3%	18.9%

The trauma score classes (representing severity of damage) are related to "impairment of the whole person" monetary compensation given by the Veterans Administration for psychological trauma-related impairment of veterans. The monetary damage estimate for each class is based on the values developed in the Tug Fork report, adjusted to 1983 price level by the Consumer Price Index (CPI). The following table shows the monetary value of the flood related trauma damage for the 1979 Easter flood in Jackson, Mississippi.

TABLE I-3
TRAUMA DAMAGE PER PERSON
JACKSON, MISSISSIPPI
1979 EASTER FLOOD

CLASS	PERCENT IN CLASS		DAMAGE FOR CLASS		WEIGHED DAMAGE PER PERSON
CLASS I	15.8%	x	$0	=	$ 0
CLASS II	65.3%	x	$1326.60	=	$ 888.27
CLASS III	18.9%	x	$4315.20	=	$ 815.57

$1,682.84 in 1979 Dollars

(CPI = 181.5)

$2,488.00 in 1983 Dollars

(CPI = 268.4)

Damage Per Household Flooded = 3 (average persons per household) x $2488 (damage per person) = $7,464 (per household) for the 1979 event. Since 1,976 households were flooded in the 1979 flood, the total estimated trauma damage for that event is 1,976 (households) x $7,464 (per household)=$14.8 million in 1983 dollars.

CONSTRUCTION OF STAGE DAMAGE RELATIONSHIP

The flood trauma damage estimated above is for one flood event. Since there are no surveys of flood trauma damage of any community for more than one flood event, there is no firm empirical evidence of the relationship of flood trauma to greater or smaller flood events. At this time, construction of the

trauma stage-damage relationship based on the number of households affected (hence persons) appears to be a logical and reasonable assumption. Table I-4 shows the effects of that assumption.

TABLE I-4

FLOOD RECURRENCE VERSUS TRAUMA DAMAGE RELATIONSHIP

JACKSON, MISSISSIPPI

Flood Recurrence	No. of Households Affected	Estimated Trauma Damage ($)*
2 YEAR	0	0
5 YEAR	24	179,136
10 YEAR	119	888,216
20 YEAR	387	2,888,568
25 YEAR	522	3,896,208
33.3 YEAR	798	5,956,272
50 YEAR	1,064	7,941,696
100 YEAR	1,505	11,233,320
200 YEAR	3,033	22,638,312
500 YEAR	3,523	26,295,672

*Number of households affected x $7,464

PART II

FLOOD BACKGROUND

BACKGROUND

The Jackson, Mississippi, Standard Metropolitan Area (SMA), consisting of Hinds and Ranking Counties, had a total 1980 population of 320,425. Slightly more than 80 percent of those counted were classified as urban residents. The City of Jackson itself, located almost entirely in Hinds County, had 202,895 residents, 63 percent of the SMA's total. About 60 percent of the population was white, and all but a tiny fraction of the remainder were black. There were 107,886 households identified in 1980, with an average of 2.97 persons in each.

Extremely heavy rainfall occurred over the upper portion of the Pearl River Basin on the 12th and 13th of April 1979. One headwaters gauge, at Louisville, Mississippi, recorded 9.33 inches on the 12th and another 16.25 inches on the 13th, for a two-day total of 25.58 inches. Prior rainfall in the Jackson area on 11 April had totalled 4.68 inches, thereby utilizing most of the storage in the river and in Ross Barnett Reservoir just upstream from Jackson. Two other gauges above Jackson-Edinburg and Koscinsko recorded 10 and 13 inches, respectively, over the two-day (12-13 April) period. This storm was later estimated to form an exceedance frequency of 56 years.

By 15 April floodwaters had inundated large areas of Jackson, and many residents had to be evacuated from their homes. The East Jackson levee, across the river from the city, held with water nearly to the top, but the levee which protects parts of Jackson was flanked at the north, flooding the areas behind it. With the reservoir full, Ross Barnett Dam was releasing water at a rate of 125,000 cubic feet per second to keep the dam from being

overtopped. Even with the regulation provided by the dam, the discharge as measured at the Jackson gauge had an expected exceedance frequency of about 200 years. On 17 April the river crested at about 15 feet above floodstage.

Four areas of concentrated residential development were affected by the April 1979 flood. The northeast section of Jackson is the largest of these areas and can be divided into three major neighborhoods. In one neighborhood the homes are relatively new and range in value between $60,000 and $80,000. In the second, the homes are also relatively new and are in the $150,000 and up value range. The third neighborhood in this area is one of older homes which are being refurbished. These homes range from $40,000 to $50,000. In the downtown area, the homes are 25 to 30 years old and range in value from $10,000 to $20,000. The third and fourth concentrations of residential development are in the southern section of Jackson and directly across the river in Richland. Both areas can be characterized by moderately priced homes in the $30,000 to $50,000 range with mobile homes and trailer parks.

Damages in Hinds and Rankin Counties were $206,117,000 and $22,701,800, respectively, for a total of $228,818,800. Approximately $227 million was classified as urban damage, including residential and commercial categories.

PART III

THE 1979 FLOOD TRAUMA SURVEY

AT JACKSON

THE 1979 FLOOD TRAUMA SURVEY AT JACKSON

This section of the report* focuses on social, psychological, and physical health consequences of the 1979 Easter Flood for the survey sample. While the most evident consequences of a natural disaster are typically related to direct economic upheaval and physical destruction, victims may also suffer less evident social and psychological problems as well. There is a large and growing body of research documentation on the psyschological trauma from natural events such as floods, and the behavioral changes that result.

Social consequences include displacement of residents from their homes for a day or longer, the occurrence of looting, and other self-reported lifestyle disruptions. Psychological consequences are of a wide variety: insomnia, nervousness, anxiety, depression, general mental confusion, loss of appetite, and so forth. These latter effects were carefully measured in the field survey of the Easter Flood and the items used are available to the reader in Appendix D, the Interview Form.

Social Consequences

Natural disasters frequently cause disruptions in daily lifestyle. Of the sample responding, 98.6 percent (n=497) evacuated their homes. Of these persons, 89 percent were out of their residence for several weeks or more (n=429). Only 1.7 percent (n=8) evacuated for a day or less. Finally, 9.3 percent (n=45) were absent for about a week.

*Part III herein is excerpted from Orville R. Cunningham, Quentin A.L. Jenkins, Joyce L. Smith et al., An Impact Assessment of the 1979 Easter Flood on Residential, Commercial, and Industrial Structures, in Jackson, Mississppi, for US Army Engineer District, Mobile, 1982.

While natural disasters victimize some residents, they also provide a chance for others to illegally obtain possessions through looting. Thirteen percent of those responding underwent some looting of their premises. Fifteen households suffered losses in excess of $1,000.

In an effort to broadly measure the short- and long-term effects of the 1979 Easter Flood, respondents were asked: "Has the flood had an effect on your way of life, either short- or long-term? Sixty percent answered "Yes". The single largest reponse category was financial costs. Other answers include disruption of routine, nervousness, anxiety/worry, and a realization of the need for better preparation. While the financial consequences of the flood were most severe, clearly the victims felt pressures in non-economic ways as well.

Psychological Consequences

Following a large-scale natural disaster, psychological stress reactions may take many forms. These include insomnia, nightmares, anxiety, trembling and fear. For the present sample, post-flood psychological stress is measured by six fixed-choice questions:

Do you think or daydream about the flood?

Do you listen more closely for weather advisories now than before the flood?

Do you feel more anxious, nervous or upset when it looks like bad weather than before the flood?

Do you worry more now about flooding, specifically when it rains hard?

Do you get any kind of physical reaction when it rains hard or bad weather threatens that you didn't get before the flood?

Table III-1 presents a summary of positive responses to each item. The most frequently reported response is listening more closely to weather advisories since the flood (87.5 percent). Seventy-two percent report feeling more anxious, nervous, or upset when it looks like bad weather. Also, 80.5 percent worry more about flooding when it rains hard. While comparatively few have physical reactions when it rains hard or threatens bad weather (30 percent), over 45 percent think, daydream, or have nightmares about the flood.

These figures indicate that Jackson victims of the 1979 Easter Flood continued to suffer a considerable amount of psychological stress at the time of the interview. The responses to these six items can be scaled in such a manner as to divide the sample into high, medium, and low stress subgroups. If respondents had not experienced the described situation, they were given a score of 0 for that item. If the described situation was experienced immediately following the flood but not at the time of the interview, a value of 3 was scored.

TABLE III-1
NUMBER AND PERCENTAGE OF RESPONDENTS
ANSWERING YES TO SPECIFIC PSYCHOLOGICAL
STRESS ITEMS

PSYCHOLOGICAL STRESS ITEM	(No.)	(Percent)
1. Do you think or daydream or have night dreams about the flood?	230	45.5a

TABLE III-1 (Con't)

2.	Do you listen more closely for weather advisories now than before the flood?	452	87.5b
3.	Do you feel more anxious, nervous, or upset when it looks like bad weather than before the flood?	373	72.0c
4.	Do you worry more now about family members who aren't home during bad weather than before the flood?	150	30.0d
5.	Do you worry more now about flooding, specially when it rains hard?	416	80.5e
6.	Do you get any kind of phsical reaction when it rains hard or bad weather threatens that you didn't get before the flood?	157	30.5f

---

A Based on N=517
B Based on N=500
B Based on N=517
C Based on N-517
D Based on N=518
E Based on N=515

Total psychological stress scores may be obtained by adding the six items for each respondent. The range of scores for the scale is 0 (the lowest amount of stress) to 18 (The highest amount). Table III-2 is a grouping of scores into low stress (0 to 5), medium stress (6 to 11), and high stress (12 to 18) categories.

TABLE III-2
NUMBER AND PERCENTAGE DISTRIBUTION
OF PSYCHOLOGICAL STRESS SCORES

LEVELS OF STRESS	NO.	PERCENT
Low Stress	25	4.8
Medium Stress	340	65.6
High Stress	153	29.5
Total	513	99.9*

*Percentages do not total 100 due to rounding error.

As can be seen, only 4.8 percent of the sample are in the low stress category. Almost two-thirds (65.6 percent) fall in the intermediate group. Finally, 29.5 percent of respondents scored high on the scale. Psychological stress, as measured by the six items described, is widely evident in the present sample.

As a general indicator of emotional/mental health, the respondents were asked how they felt emotionally or mentally since the flood, as compared to before. Table III-3 summaried the responses. A total of 200 respondents (38.8 percent) report feeling "not as good" or "much worse". The majority (57.9 percent) report no general change in their mental outlook.

TABLE III-3

MENTAL/EMOTIONAL OUTLOOK OF
RESPONDENTS SINCE THE FLOOD
AS COMPARED TO BEFORE

Outlook	NO.	PERCENT
Much Better	17	3.3
About the same	299	57.9

TABLE III-3 (Con't)

Not as good	146	28.3
Much worse	54	10.5
Total	516	100.00
No Response	2	
Grand Total	518	

In summary, psychological reactions to the 1979 Easter Flood are fairly widespread, even more than a year after the event. Respondents apparently suffer higher levels of stress when bad weather threatens or during heavy rains than at any other time.

Physical Health Consequences

While flood-related psychological stress is evident in the sample, few of the victims actually sought help for physical or emotional problems. Seventy-seven respondents (15.8 percent) sought professional aid for such problems, perceived on their part to be flood-related. Sources of aid mentioned include seeing a doctor (n=40), hospitalization (n=19), and medication (n=17). Symptoms leading to the seeking of aid include nervousness (n=17), heart and blood pressure problems (n=19), anxiety (n=7), among others.

Similar to the indicator of general psychological well-being, the respondents were asked about the status of their physical health since the flood. One hundred and sixty respondents (31 percent) answered "much worse" or "a little worse". The majority (65.1 percent; n=336) considered their physical health to be about the same as before the flood (Table III-4).

TABLE III-4
STATUS OF RESPONDENT'S PHYSICAL
HEALTH SINCE THE FLOOD AS
COMPARED TO BEFORE

PHYSICAL HEALTH	NO.	PERCENT
Much worse	52	10.1
A little worse	108	20.9
About the same	336	65.1
A little better	17	3.3
Much better	3	.6
Total	516	100.0
No response	2	
Grand Total	518	

The survey data discussed here indicate wide and considerable social disruption following the 1979 Easter Flood, rather infrequent looting, and presence of mild to serious psychological stress reactions in the victims. While physical damage estimates receive most of the attention following natural disasters, victims often suffer these more latent consequences as well.

PART IV

THE TRAUMA INDEX

AND

DAMAGES ESTIMATION RESULTS

AT JACKSON

THE EVALUATION OF HUMAN COSTS OF FLOODING AT JACKSON

The Tug Fork report contains an extensive discussion of human costs of flooding methodology. It is based on two fundamental steps. One, a series of survey responses to a number of indicators of human impairment provide the mechanism for determining the degree of impairment. In the Jackson, Mississippi Case, twenty trauma indicators are used (they are shown in Table IV-1). The scores were divided into three catagories of impairment. The first class (0-8) indicates a relatively minor degree of human impairment. The second class (9-12) indicates a moderate degree of impairment. The third class (13-20) indicates a severe degree of impairment. This sequence of steps is based on an American Medical Association procedure for determining human impairment*. The second major step of the analysis is to relate the degree of impairment to monetary compensation. For this analysis, the compensation schedule used by the Veterans Administration* is used.

Each response in the post-1979 Flood Survey was scored on 20 AMA - comparable symptom indicators of traumatic experience. Table IV-1 shows the definition and scoring criteria along with survey response for each trauma variable. The sum of the scores (maximum is 20) for each household's response was then computed and is shown in Table IV-2. For this survey, the majority of the cases fell into the middle range of the trauma scale. As was done in the Tug Fork report, the trauma scale is divided into three classes: (1) limited trauma damage (2) moderate trauma damage and (3) severe trauma damage. Table IV-3 shows the results of this division of the cases.

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*See Appendix A.

Table IV-1
FLOOD TRAUMA SCALE
JACKSON, MISSISSIPPI DAMAGE SURVEY
FOLLOWING 1979 EASTER FLOOD

VARIABLE NAME AND DESCRIPTION	SCORING CRITERIA	SAMPLE %
INDICATORS OF FLOOD SEVERITY TO HOUSEHOLD:		
MANHOURS - Manhours required for cleanup	Lowest thru 336 hours = 0	46.5%
	337 hours throughout = 1	53.5%
HITHARD - Household income/ total flood damage	Damage > Annual Income = 1	73.0%
	Damage < Annual Income = 0	27.0%
INDICATORS OF HOUSEHOLD ABILITY TO DEAL WITH FLOOD RELATED IMPACTS:		
OLD - Age of Senior Family number	62 or less = 0	90.0%
	Over 62 = 1	10.0%
INCLEV - Household Income	$8000 or less = 1	18.9%
	more than $8000 = 0	81.1%
INDICATORS OF TRAUMA:		
MISS WORK - Missed worked because of flood	yes = 1	32.8%
	no answer or no = 0	67.8%
DISTRESS - Worry due to flood	yes = 1	90.9%
	no = 0	9.1%
ANXIOUS - Degree of anxiety due to flood	very anxious/upset = 1	62.7%
	somewhat or not at all = 0	37.3%
DIDEVAC - Evacuated from home	yes = 1	94.6%
	no = 0	5.4%
HLTHAFT - Health after flood compared to before	much worse = 1	10.0%
	any other response = 0	90.0%
FEELMENT - Mental outlook after flood compared to before	worse = 1	29.6%
	same, not as good = 0	61.4%
FAMMEMS - Do you worry more about family members who are not home during bad weather than before the flood?	yes = 1	16.6%
	no = 0	83.4%

Table IV-1 Cont'd

VARIABLE NAME AND DESCRIPTION	SCORING CRITERIA	SAMPLE
PROHELP - Did you seek professional help for emotional or physical problems due to flood?	yes = 1 no = 0	14.9% 85.1%
LONGGONE - How long before return home?	more than 5 weeks = 1 less than 5 weeks = 0	93.1% 6.9%
RETNORM - How long before return to normal?	Several wks or months = 1 Shorter time = 0	97.3% 2.7%
BADWEATHER - Fear of bad weather	Lot more nervous = 1 Other = 0	27.4% 72.6%
OUTLOOK - A scale based on a set of attitudes towards life after flood.	increase in negative = 1 other = 0	32.6% 67.4%
SHORTIMA - Short term problems (9 potential problems)	yes to one or more = 1 no = 0	29.2% 70.8%
LONGTERMA - Long term problems (9 potential problems)	yes to one or more = 1 no = 0	36.5% 63.5%
LOOTING - House looted during or following flood	yes = 1 no = 0	12.7% 87.3%
SPIRIT - Degree of neighborliness since flood	decreased = 1 increased = 0	3.1% 96.9%

TABLE IV-2
TRAUMA INDEX RESULTS
JACKSON, MISSISSIPPI
DAMAGE SURVEY FOLLOWING 1979 EASTER FLOOD

Trauma Score	No. of Cases	% of Total	Cumulative %
3	1	.2	.2
4	1	.2	.4
5	3	.6	1.0
6	8	1.5	2.5
7	23	4.4	6.9

TABLE IV-2 Con't

8	46	8.9	15.8
9	91	17.6	33.4
10	103	19.9	53.3
11	70	13.5	66.8
12	74	14.3	81.1
13	40	7.7	88.8
14	33	6.4	95.2
15	14	2.7	97.9
16	1	.2	98.1
17	4	.8	98.8
18	1	1.2	99.0
19	2	.4	99.4
20	3	.6	100.0
TOTAL:	518	100.0	

TABLE IV-3
TRAUMA SCORE CLASSIFICATION
JACKSON, MISSISSIPPI
DAMAGE SURVEY FOLLOWING 1979 EASTER FLOOD

Trauma Score	No. of Cases	Frequency (percent)
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Since two other human cost flooding studies have been conducted it is enlightening to compare the three situations. Each of the communities, as stated, have significantly different flooding conditions (velocity, depth, duration, debris transport, etc.), land use, and socio-economic, and historic characteristics of flood plain occupants. The results at Jackson correspond with inferred expectations based on these attributes. A significantly higher percentage of the trauma scores are in the middle range and fewer are in the severe trauma effects class, than was true in the volatile flood in the Tug Fork Valley. Table IV-3 compares the percentage of individuals in each trauma effects class in the three studies.

TABLE IV-4
COMPARISON OF PERCENTAGE OF INDIVIDUALS IN EACH
TRAUMA EFFECT CLASS
TUG FORK, LAKE ELSINORE, AND JACKSON

	I	II	III
TUG FORK, WEST VIRGINIA AND KENTUCKY	30.0%	41.0%	29.0%
LAKE ELSINORE, CALIFORNIA	24.6%	56.4%	19.0%
JACKSON, MISSISSIPPI	15.8%	65.3%	18.9%

The trauma score classes (representing severity of damage) are related to "impairment of the whole person" monetary compensation given by the Veterans Administration for psychological trauma-related impairment of veterans. The monetary damage estimate for each class is based on the values developed in the Tug Fork report, adjusted to 1983 price level by the Consumer Price Index

(CPI). Table IV-5 shows the monetary value of the flood-related trauma damage categories and the single-event total for the 1979 Easter flood in Jackson, Mississippi.

TABLE IV-5
TRAUMA DAMAGE PER PERSON
JACKSON, MISSISSIPPI
1979 EASTER FLOOD

CLASS	PERCENT IN CLASS		DAMAGE FOR CLASS		WEIGHED DAMAGE PER PERSON
CLASS I	15.8%	x	$0	=	$ 0
CLASS II	65.3%	x	$1326.60	=	$ 888.27
CLASS III	18.9%	x	$4315.20	=	$ 815.57
					$1,703.84 in 1979 Dollars
					(CPI = 181.5)
					$2,488.00 in 1983 Dollars
					(CPI = 268.4)

Damage Per Household Flooded = 3 (average number of persons per household) x $2488 (damage per person) = $7,464 (per household) for the 1979 event. Since 1,976 households were flooded in the 1979 flood, rather than just the 518 in the survey sample, the total estimated trauma damage for that event is 1,976 (Households) x $7,464 (per household)=$14.8 million in 1983 dollars for the "Easter" flood event.

CONSTRUCTION OF STAGE DAMAGE RELATIONSHIP

The flood trauma damage estimated above is for just one flood event. Since there are no surveys of flood trauma damage to any community for more than one flood event, there is no firm empirical evidence of the relationship of flood trauma magnitude to greater or smaller flood (water) events. Therefore, at this time, construction of the trauma stage-damage relationship -- by basing it on the number of households affected (hence persons) -- appears to be a logical and reasonable assumption. Both the empirical evidence we have from three unrelated floods, and the body of social psychological literature, suggest it as well. Table IV-6 shows the effects of that assumption.

TABLE IV-6

FLOOD RECURRENCE VERSUS TRAUMA DAMAGE RELATIONSHIP

JACKSON, MISSISSIPPI

Flood Recurrence	No. of Households Affected	Estimated Trauma Damage ($)*
2 YEAR	0	0
5 YEAR	24	179,136
10 YEAR	119	888,216
20 YEAR	387	2,888,568
25 YEAR	522	3,896,208
33.3 YEAR	798	5,956,272
50 YEAR	1,064	7,941,696
100 YEAR	1,505	11,233,320

TABLE IV-6 (Con't)

200 YEAR	3,033	22,638,312
500 YEAR	3,523	26,295,672

Based on the damage frequency relationship shown in Table IV-6, the estimated average annual equivalent value of flood trauma damage in Jackson, Mississippi is $581,400 in 1983 dollars.

APPENDIX A

METHODOLOGY OF TRAUMA IMPAIRMENT

FLOOD DAMAGE ESTIMATION

THE SUMMARY DEVELOPMENT CASE

IN THE

TUG FORK VALLEY

Constructing the Flood Trauma Scale

The first step in quantifying flood effects involves grouping responses to various questions to get an overall picture of the flood impact on each household interviewed. In doing this, the trauma scale, as described previously, was derived. To obtain this scale, several factors identified as potentially contributing to the overall trauma experienced by flood victims were examined for each household surveyed. Each contributing factor was given a rating of 0 or 1 to indicate an experience which was not likely to contribute to the overall trauma of the flood experience or an experience which would add to the severity of the situation, respectively. (See a listing of contributing factors in the Appendix.) Twenty-two factors were examined for each household. A twenty-third factor was also looked at which gave respondents the opportunity to speak of the positive effects, if any, that the flood may have had on their lives. This factor was rated -1 and had the effect of reducing the respondent's trauma level if the response indicated that the household did benefit in some way from the flood. For example, some comments were that the flood helped bring neighbors closer together because of the concern displayed over one another's safety and the generosity toward those who had been left homeless.

Tabulation of these factors involved grouping responses to sets of questions to establish a rating on severity of flood impact. The ratings are designed to designate those factors which did contribute to the trauma of the event for each household. Thus, a yes (rating = 1) indicates the respondent experienced the trauma-contributing event A no (rating = 0) indicates the respondent experienced minimal or no negative effects from

CODING OF TRAUMA CONTRIBUTING FACTORS

Trauma contributing factors

General health — Coded

Has health changed as result of flood?
- worsened 1
- same, better 0

Physical injury

Was anyone injured or made ill during flood?
- yes 1
- no 0

What was the nature of the injuries?
- high blood pressure, heart problems, phychological distresses 1
- colds, sprains and strains, broken bones, back ache 0

Mental stress

Did you receive any warning of the flood?
- no warning 1
- warning 0

Did the warning give you time to protect yourself?
- warning not sufficient 1
- sufficient warning 0

Have you had any previous flood experiences?
- no 1
- yes 0

Do you know of anyone who died as a result of the flood?
- yes 1
- no 0

Did you experience any change in relationship with friends and/or neihbors as a result of the flood?
- yes, worsened 1
- no change; better 0

Did you experience any change in relationships among family members as a result of the flood?
- yes, worsened relationship 1
- no change; better 0

cont'd. Coded

How badly was your home damaged by the flood?
- some damage to completely ruined 1
- no damage 0

Did you lose anything of sentimental value in the flood?
- yes 1
- no 0

How would you describe your family's state of mind since the flood?
- worsened in some way 1
- same as before the flood 0

How has your state of mind changed as a result of the flood?
- worsened 1
- same as before the flood 0

In what other ways has the flood experience upset you?
- other concerns related to the flood 1
- none 0

Hassle factors

Were you forced to leave your home during the flood?
- yes 1
- no 0

What things did you have to do without during the flood?
- clothing; water; utilities; food; sleeping quarters; all of above 1
- nothing 0

How long was it before you could return to your home?
- more than a day 1
- 1 day or less 0

- if never returned to their home because of extensive damage 1

What things did you have to do to your home to make it livable again?
- new furnishings, rewiring, plumbing, new furnace, cleaning 1
- none or very little 0

What problems, if any, did you encounter during cleanup?
- financial, physical, mental, other 1
- no problems 0

Did anyone in family miss work because of the flood?
- yes .....
- no .....

cont'd.

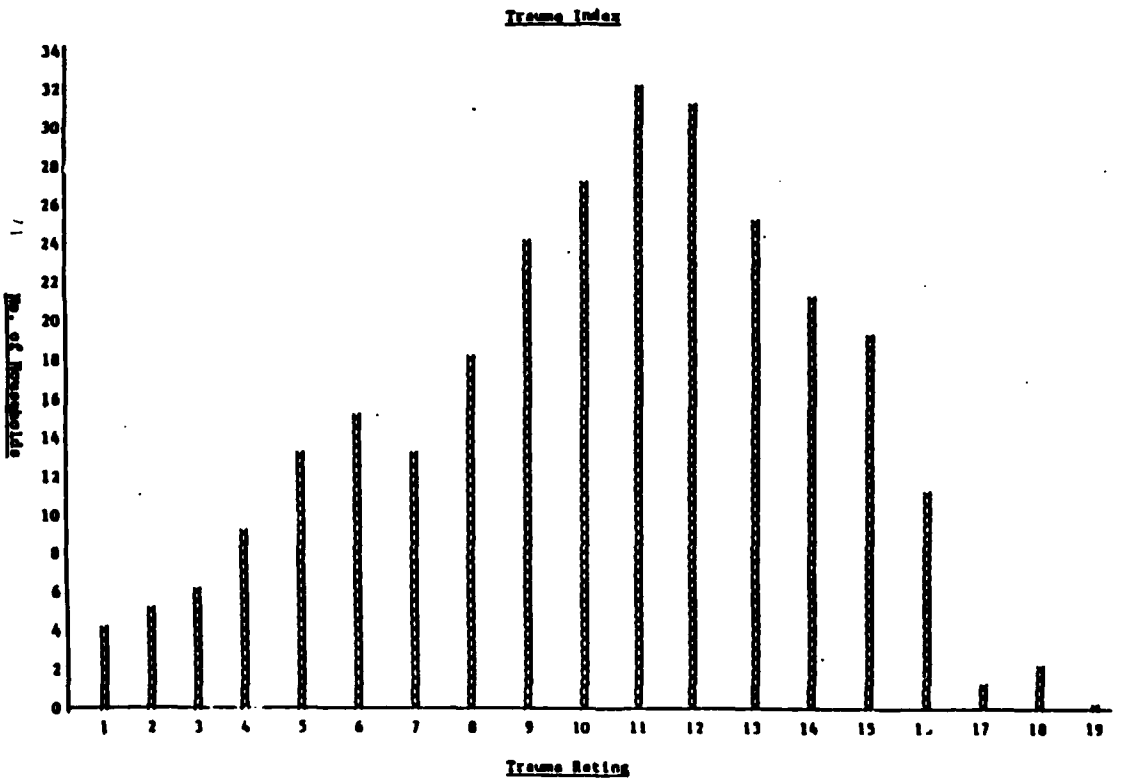
Coded

Extended effects

Have things returned to normal in your household since the flood?
- no; somewhat 1
- yes; unsure 0

Do you feel that by experiencing the flood, you have met a great challenge?
- yes 1
- no, unsure 0

the contributing factor being considered. These ratings were then aggregated for each household by summing them. This gave each household an overall rating, placing at a specific point on the continuum of the scale. The scale ranged from a low of -1 to a high of 20. (See Figure 4)



The highest trauma rating possible under this rating procedure was a 22. However, the highest rating on the households surveyed was a 20. The median level of trauma was 10.6 and the distribution is skewed slightly toward the left. A third of the households, 33 percent, were positioned between the 10th and 12th steps of the scale which is the middle range of the total possible trauma points.

The scale by number of households and with number of persons per household is presented in Table 25. Note that households with higher ratings tended to have more persons in the household, as would be expected.

Due to the ordinal nature of the scale which has been constructed here, many statistical tests have little validity. That is, an ordinal scale defines the relative position of individuals with respect to, in this case, flood trauma, but distances between points on the scale have little meaning. It is merely a ranking procedure.

Establishing Levels of Human Impairment

To provide for evaluation of human benefits the trauma scale must be further defined. It should correspond to what American Medical Association (AMA) terms "percent impairment of the whole man". A rating or percent of impairment is determined by an evaluating physician. It is an "appraisal of the nature and extent of the patient's illness or injury as it affects his personal efficiency in one or more of the activites of daily living". (AMA, 1977)

The majority of contributing factors identified as potentially influencing the degree of trauma were psychological rather than physiological. Therefore, the AMA criteria for evaluating permanent impairment due to psychoneuroses was chosen to define the trauma scale ratings. Trauma scale levels derived from the household survey were then correlated with ranges of percent impairment described by the AMA.

The AMA classifies loss of function due to psychoneuroses are described in specific medical terms. These reflect six "pshychoneurotic reactions" -- anxiety, depressive, phobic, psychophysiologic, obsessive-compulsive, and conversion. Ratings determined by the AMA include not only the illness itself, but social and economic consequences as well. The intent is to evaluate the impairment in terms of loss of physiological, psychological, personal, or social adjustment due to flood trauma.

The three classes of impairment are summarized below, listing those AMA descriptive statements which apply most directly to responses received on the household survey.

Class I -- Impairment of whole man = 0 to 5 percent:

-- Mild anxiety episodes, are predominantly in response to stress situations, requiring little or no treatment, and seldom associated with clear-cut subjective suffering.

-- Usual activities of daily living can be accomplished but are associated on occasion with lack of ambition, energy and enthusiasm for the current situation.

-- Self-limiting reactions to passing stress, eg., gastrointestinal upsets.

Class 2 -- Impairment of whole man = 10 to 45 percent:

-- Moderately severe anxiety and apprehension.

-- Depressive reactions leading to disturbances of sleep cycle and eating habits, loss of interest in customary personal and social activities.

-- Fear-motivate behavior which interferes in a mild to moderate way with the activities of daily living.

-- Episodes of loss of physiological function.

Class 3 -- Impairment of the whole man = 50 to 95 percent:

-- Severe states of foreboding, tension and apprehension.

-- Depressive reactions display a marked loss of interest in the usual activities of daily living, such as eating or self-care.

-- Severe phobic patterns of adjustment occur that behavior becomes bizarre and disruptive.

-- Loss of physiological function occurs frequently.

Relating the Flood Trauma Scale to Human Impairment

Examining each step of the scale individually, in terms of trauma factors present at each step, gives some indications that there may be an ordering of the factors which come into play as the scale progresses from -1 to 20. That is, those factors which are commond to those households at the lower end of the scale are characterized by: not having received any warning; having to leave their homes during the flood; having to perform some repairs on their homes; and believing that they had met a great challenge through the flood experience. (There were things such as clothing and heat that they had to do without during the flood.) This lower range extends from -1 to 3 on the trauma scale.

At a rating of 4 through 8, other factors come into play, such as: a general worsening in health; a rating of the damages to their homes; loss of possessions of sentimental value; indications that the flood had some negative effects on the overall mental well-being of family members and upon the respondents' mental state; indications that these households had been displaced from their homes for periods longer than one day; and had household members who had missed work due to the flood.

The range 9 to 12 on the trauma scale brought in the highest concentrations of factors, with the addition of such factors as: illnesses caused by the flood; deaths attributed to the flood; changes in relationships with friends and neighbors; additional evidence that the mental well-being of the household head as well as family members has been in some way affected; financial, physical and pshychological problems which arose during cleanup; households permanently displaced due to severe damages, and a feeling within households that their lives had not yet returned to normal since the flood.

The next step on the scale brings in the remaining factors and shows a concentration of these between the scale points of 13 to 16. As well as the above mentioned factors, households in this range show: illnesses and injuries of the household head which fell into the categories of heart problems, high blood pressure and psychological distresses; and changes in family relationships that were attributed to the flood.

The last grouping on the scale, covering points 17 to 20, shows a scattering of households across almost all factors. Summarizing this breakdown, it shows a five step scale as follows:

-1 to 3 ...temporary displacement, home repairs, lack of basic living necessities, feeling they had met a great challenge.

4 to 8 ... above factors plus general worsening of health, reported structure damages, loss of sentimental possessions, negative impacts on mental well-being of family, missed work.

9 to 12 ... above factors plus flood related illness, changes in relationship with neighbors, additional negative effects on mental well-being of the family, problems during cleanup, permanent displacement, lack of feeling of normalcy within the households.

13 to 16 ... above factors plus serious flood-related illnesses and injuries, changes in relationships with the family.

17 to 20 ... almost all factors reported.

Preliminary attempts to scale the contributing factors through the Guttman scaling technique did not support our tentative hypothesis that the scale was cumulative. That is, that as the level of trauma increases, it follows the same pattern for each respondent. (e.g. Two households with a trauma rating of 10 will have experienced the same flood efects in order to have been placed at the same point on the trauma scale.) The coeffi-cient of reproducibility was .81, with 6 percent improvement. (A coeffi-cient of reproducibility greater than .9 would indicate a valid scale.) Further manipulation of the variables, i.e. withdrawing some variables from the scale and/or regrouping the variables, may improve the results of the Guttman scale.

With this procedure approximately two-thirds of the sample falls within the middle category.

Referring again to the step-by-step picture of households at each point on the trauma scale, we see that factors which appeared in the upper position of the scale are most heavily clustered within the 13 to 16 point range. For example, of the household heads reporting serious illnesses caused by the flood, almost 70 percent fall within the 13 to 16 point range on the trauma scale. Likewise, for those reporting changes in relationships among family members, 74 percent fell within this same range. Additionally, nearly 60 percent of the households reported illness among family members. Almost 50 percent of those households felt their lives had not gotten back to normal since the flood. Forty-seven percent of households who reported that their family's mental well-being had suffered and 41 percent who felt their state of mind had been adversely affected also are within the 13 to 16 point range. Compared with the percentage of the total sample within the range, 27 percent, this suggests that given the apparent ordering of the trauma contributing factors, the households in the range from 13 to 16 points and higher reflect those which experienced the greatest impact from the flood. Thus, this group of households should be placed in the Level III category which the AMA has defined for rating impairment.

Looking at the lower end of the trauma scale and at the AMA ratings for impairment suggests that those households which fall from -1 to 8 on the trauma scale may be placed in the Level I rating for impairment. This group would be indicative of those households which were least affected by the flood. That is, this group experienced what we have termed hassle

factors as well as some factors which may have contributed to the mental stress of the flood experience. However, most of those factors identified as mental stress factors, physical injury and general health status, as well as extended adverse affects, are not present in this group of households. Thus, in comparison with groups of households at other levels on the scale, this group would be most fairly categorized as the least affected group.

This brings the final breakdown of the trauma scale to be:

Level I = -1 to 8 points (representing 30 percent of sample households)

Level II = 9 to 12 points (representing 41 percent of sample households)

Level III = 13 to 20 points (representing 29 percent of sample households)

Adjusting the Trauma Scale for Frequency and Magnitude of Flooding

Little information is available on the duration of the psychic impairment caused by flood experiences. But the history of flooding in this area of Appalachia suggests that the frequency and magnitude with which floods occur may be the key factors to examine. Flood zone locations were available for 156 of the households surveyed. The three households which fell at 17 or above on the trauma scale were located below the five year flood frequency line at the time of the flood. The one household positioned at -1 on the trauma scale was located in the SPF frequency zone at the time of the flood. Using the 156 households as a subsample for which flood frequency data is available, we positioned the remaining households on the

upper level of the trauma scale (representing one-sixth of the total households surveyed). Thirty-two percent of the households were within the five year flood line and another 32 percent were within the 20 year flood line. This suggests that those suffering the greatest trauma as it has been defined here were indeed those located in the high frequency flood zones and those who are also most likely to be victims of subsequent floods within their lifetimes. In addition, another 32 percent of those households on the highest level of the trauma scale were located between the 20 and 100 year flood lines. From this it may be inferred that the compensation allocated to those individuals on Level III of the trauma scale will vary little for floods of 100 year magnitude or less. This may be so for those on the middle level of the trauma scale as 81 percent of sub-sample households rated Level II on the trauma scale are also located below the 100 year frequency line.

Information on the depth of flood waters was obtained for a group of 122 households. A cross-tabulation of the trauma scale with depth of flood waters for each of the households in this subset is shown in Table 26. The five-part breakdown of the trauma scale described earlier in this section is used since it displays the most accurate descriptive breakdown of indiviual households.

Table 27: Trauma Rating vs. Depth of Flood Waters

Trauma Scale Rating	1 2 3	4 5 6	7 8 9	10 11 12	13 14 15	16 17	Total Households
	33%	33%	33%				
-1 to 3	- 1 -	- 1 -	- - 1	- - -			3
	*						
	31%	28%	25%	5%	3%	8%	(100%)
4 to 8	4 5 2	3 5 2	2 4 3	- 2 -	1 - -	3 -	36
		*					
	25%	31%	23%	17%	2%	2%	(100%)
9 to 12	1 3 8	7 2 6	3 5 3	5 3 -	1 - -	- 1	48
			*				
	9%	19%	41%	19%	6%	6%	(100%)
13 to 16	1 2 -	2 3 1	3 5 5	2 3 1	- 1 1	2 -	32
				*			
	-	-	-	100%	-	-	(100%)
17 to 20	- - -	- - -	- - -	- - -	- - -	- -	3
Total Number of households	6 11 10	12 11 9	8 14 12	8 4 2	2 1 5	5 1	30

Regression analysis showed no significant correlation between position on the trauma scale and depth of flood waters in the housing structure. However, the data dc display some tendenc toward increased trauma with increasing flood depths. This tendency can be seen by examining the percentage of households at each level on the trauma scale, moving down a single flood-depth group. For example, the percentage of households with less than 3 feet of flood waters surrounding their homes ranged from 33 percent on the low end of the trauma scale to 0 percent on the high end. Similarly, if we examine peak concentrations of households for each trauma level, the depth of waters for the highest percentage of households increases from low trauma rating to high. (Note *'s) This simple analysis is useful in that it suggests that a relationship between flood trauma and depth does exist. However, the data do not statistically support the relationship.

Other variables were also examined as potential trauma indicators. These are factors readily identified for a flood plain population which could be used as predictors of the trauma level likely to be experienced by each household in the event of a flood. These variables included: years of schooling completed by household heads, sex and age of household head, income, type of family unit, (i.e. single individual; husband-wife, no children; husband-wife with children; extended family group; etc.), as well as flood frequency zone location and depth of flood waters.

Thus far, none of these variables have proven statistically valid indicators of potential flood trauma. Therefore, at this point trauma predictions for other flood events would be unprecedented. Reviewing the procedures used to develop the trauma scale and identify potential trauma

indicators suggests that additional research of this type on other flood events is needed.

Can we conclusively say whether "trauma indicators" can be related to such factors? To apply the methodology used in this research to other flood events, some modifications in the approach need to be examined. The evaluation instrument is an extremely important link in the procedure for developing the trauma scale. Knowing the sorts of responses that may be expected from various types of questions suggests that revision of the questionnaire would help to refine the results of the scaling procedures. Additionally, the accuracy of the data used as household trauma indicators, such as depth and income, is very important so that statistical analysis will be more conclusive.

Further research on other floods would not only be useful for clarifying and concluding the results presented here. It would also be useful in analyzing the degree of impact of a flood on its victims by comparing characteristics of the flood itself, as well as those of the flood plain and its population.

III. VALUATION OF FLOOD TRAUMA FOR THE 1977 FLOOD IN THE TUG FORK VALLEY

Three approaches to estimating the social willingness to pay or be paid for flood trauma are presented. The first follows the approach discussed in the previous section, applying the three step version of the flood trauma scale which was felt to reflect the impairment levels of the American Medical Association. In turn, these are related to the compensation rates used by the Veteran's Administration.

Two alternative approaches have intrinsic merit and provide a measure of confirmation. The first utilizes the procedures followed in the allocation of the funds among the litigants in the Buffalo Creek suit. The method of estimating differences in trauma is of interest in this case. The second utilizes a widely cited scale that measures different degrees of social readjustment due to various life events. These are then valued by applying average Worker's Compensation rates.

Valuation of Flood Trauma Scale by VA Compensation Rates

The Veteran's Administration has no currently recorded precedence for granting compensation for what is referred to as war trauma. In addition, psychological disturbances are described in VA ratings only as they pertain to "industrial adaptability", ie., earning capacity. (VA Proposed Revision of Schedule for Rating Disabilities, 1973) Ratings involving psychiatric disabilities are described in terms of time lost from work and the decrease in work efficiency. "Social inadaptability" -- poor relations with others -- is recognized as an indication of emotional illness. But it cannot be

TRAUMA FACTORS

GENERAL HEALTH
PHYSICAL INJURY

MENTAL STRESS
- NO WARNING
- PRIOR FLOOD
- DEATHS
- RELATIONSHIPS
- PROPERTY LOSS
- SENTIMENTAL LOSS
- STATE OF MIND

"HASSLE"--

SCORE

YES = 1
NO = 0

INDIVIDUAL SCORES SUMMED FOR FAMILY

AMA

PSYCHONEUROTIC IMPAIRMENT CLASSES

1. 0-5%
2. 10-45%
3. 50-95%

FLOOD TRAUMA SCALE

LEVEL 1. NO EFFECTS
LEVEL 2. MODERATE TRAUMA
LEVEL 3. LASTING EFFECTS

VETERANS' COMP.

10%	$44/MO.
50%	$232/MO.
100$	890/MO.

used as the sole basis for any specific percentage evaluation. Thus, there will be no direct correlation between ratings established for psychoses or neuroses in the VA system and ratings used here to describe flood disaster trauma.

For this reason, the AMA criteria for evaluating impairment due to psychoneuroses will be used for rating human impacts of flooding. The physiological and psychological impairment due to flooding is summarized in the trauma scale.

To apply values to this scale, we must establish compensation rates for various levels of impairment descriptive of each step. Table 28 lists the compensation payable for varying percentages of disability under the VA system.

Table 28: Compensation by Veterans Administration by Percent Disability

Degree of Disability	Monthly Compensation
Percent	
10	$ 44
20	80
30	121
40	166
50	232
60	292
70	346
80	400
90	450
100	890

Source: New York State awards, 1979 dollars

To assign values to the ranges established by the AMA for each classification, the median value of each range was determined and multiplied by the percentage rate of compensation at that level. The resulting values are:

Class 1 - 0 to 5 percent impairment

no compensation

Class 2 - 10 to 45 percent impairment

$110.55 per month or $1326.60 per year

(median = 27.50 x $4.02)

Class 3 - 50 to 95 percent impairment

$359.60 per month or $4315.20 per year

(median = 72.50 x $4.96)

Since there is one to one correspondence between the AMA classes and the levels of the trauma scale, quantifying the trauma scale is fairly simple. It involves simply multiplying the number of individuals at each level of trauma by the value established. Summing these amounts over each level of trauma yields a total value representative of the willingness to pay to avoid the risk of trauma (in this case, through flood prevention) for a one year period.

The following quote from the AMA (1977) expresses the attitude taken in developing criteria for evaluating percent of impairment:

> Individuals differ greatly in the manner and degree with which they react to the stresses of day-to-day problems and life situations. The marshaling of the body reserves, the

> use of ego-protection devices, and the resort to regressive techniques are reactions used by everyone to varying degrees in his adjustment to reality. The degree to which these mechanisms are used furnishes a useful but imperfect basis for distinguishing between individual(s).

By accepting the AMA criteria as descriptive of the trauma scale, the inference may be that respondents in the Tug Fork Valley are being judged as permanently impaired. This was not our intent. Rather, we use the AMA criterion as a guide to determine reasonable compensation for what is probably a transitory, short term effect in most cases. We expect these to vary with severity of the flooding experienced.

It was not possible in these early stages of research to have the household survey responses evaluated by a qualified psychologist. This would ususally be done in order to use such information for actual compensation. Classification based on computer analysis of responses may be somewhat arbitrary but is similar to that done in studies by osychologists. However imperfect, this process does provide a basis for ranking flood victims from least affected to most affected.

Referring back to the previous section describing AMA ratings for impairment, it can be seen that each of these classes has been represented by a percentage impairment based on the state of mental well-being. Now, the original levels of trauma can be expressed in terms of percents of psychic impairment which can readily be translated into monetary compensation amounts based on Veteran's Administration awards for disability.

Using the trauma scale in which each level represents approximately a third of the household sample, compensation will be calculated as follows:

Trauma level:

Level I = 84 households = 181 individuals

Level II = 114 households = 369 individuals

Level III = 80 households = 291 individuals

Compensation:

Class 1:

181 individuals x no compensation = $0

Class 2:

369 individuals x $1326.60/yr. = $489,515/yr.

Class 3:

291 individuals x $4315.20/yr. = $1,255,723/yr.

Total Compensation $1,745,238

How does the value of non-property damage estimated here compare with the property damage estimates developed by the Corps of Engineers shortly after the flood? We can assume that the 194 households in Class 2 and 3 above are representative of residences damaged by the 1977 flood. There will be a slight over-representation of households which suffered complete loss of their homes due to the unadjusted inclusion of the HUD trailors sample. However, this is probably balanced off by the choice of the more conservative distribution toward the Class 2 level of compensation in this example. Thus, we have an estimate of $1,745,000 per year for the non-property damages or $8,966 per household.

But how long did such trauma effects continue at this rate? Indicators for the trauma scale were identified for any time during the two years between the flood and the survey. It is likely that some of these effects of the flood lasted even less than the first year, and that many were well adjusted to by the end of the second year. But if this rate is applied for only two years, the total ($18,000) is substantially larger than the almost

$9000 per residential structure of property damage found after the flood. If this rate is applied to the more than 5300 homes damaged or totally destroyed, we have a total trauma damage level of over $72 million. This compares, total physical damage of $126.60 million, business losses of $44.9 million and emergency costs of $25.8 million.

CONCLUSIONS: PUBLIC CONSEQUENCES AND PLANNING IMPLICATIONS

The meaning of people's flood-induced resort to public assistance entitlements consists of several points. First, the data relating the individual's experiences with number of organizations contacted by the individual dispels the notion of some critics that economic aid is generally sought by people who don't need it. The logic of these data suggest that those who seek help need it. By the relative magnitude of impact suffered, and fragility of pre-flood self-sufficiency, they apparently tend to ask in degrees inverse to their actual ability to help themselves. The protection of people exhibiting this general pattern of behavior would constitute avoidance

of a present recovery cost which is founded on genuine harm to individuals. The current cost is not likely to be reduced by denial.

A second point of meaning to public assistance costs is also more apparent when observing data on the human behavior process in interaction with destructive natural causes. If people are considered as human resources from either a social system or an economic perspective, then the public entitlement funds paid for emergency and recovery costs are maintenance costs. Damage to housing, furniture, appliances, etc., are an impairment in support facilities which are required to sustain individuals and households at some acceptable level of contribution to their own viability for work, and to the economy.

What these recurring emergency and recovery costs mean, in merely trying to keep people as human resources at some minimum constant level of viability, is a third point. The output of human resource maintenance and productive potential is very likely a value which cannot (within reasonable investigative limits) be reliably determined by either the "willingness to pay" or the "net income" method on behalf of any proposed plan. At best, only fragments might be captured by these methods. But there is applicable WRS guidance providing an empirical approach which applies to a public act of human resource maintenance:

> "The cost of the most likely alternative means of obtaining the desired output can be used to approximate total value when the willingness to pay or change in net income methods cannot be used. The cost of the most likely alternative ... merely indicates what

> society must pay by the next most likely alternative to accrue the output ... This assumes, of course, that society would in fact undertake the alternative means."

The "most likely alternative" to any plan involving Federal action to avoid human resource impairment costs in Tug Fork is the NO ACTION plan, i.e., the present conditions or the "without project" condition. It need not be assumed that society would be willing to undertake this alternative (to avoidance of harm) at some estimated cost. Society has undertaken it, in the absence of other remedy, in the 1977 flood at an emergency and recovery cost of 25.8 million dollars, and at other cost magnitudes in many previous floods. The point of tracing this parallel between the usual accounting of emergency cost "damages" on the one hand, and the human resources impairment - maintenance perspective of socioeconomic analysis on the other, is not to suggest double counting of the 25.8 million dollars. It has been done for two positive reasons:

The first is to demonstrate how the initially posed parallel between a human resources maintenance interpretation and the usual emergency-recovery interpretation can be carried through, on evidence, to the same end cost. The second reason is that the equally sound human resources interpretation, ending in the "same" cost for recovery, rather strongly suggests some further

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* Water Resources Council, "Proposed Revisions to the Principles for Planning Water and Related Land Resources," Federal Register, Vol.44, No. 102, p. 30248 (Thur., May 24, 1979).

implications for the Nation which the "repeated cure" emergency recovery conceptualization of costs doesn't.

In the context of much data from many sources, and the resulting general observation about the effects of recurrent flooding in the Tug Fork Valley, the human resources perspective directly suggests a rising curve of cost for human maintenance. What most long-term observers - Federal, State, and local - have agreed is that both property and the quality of life are deteriorating under the cumulative effect of successive floods. Rehabilitative and compensatory funds are not effectively holding the economic system and social organization of the communities at some identified previous level. Nor are they preserving some minimum satisfactory qualitative state or level of active developmental capacity, set by conscious public policy.

All local effort and received funding are expended on the objective of "keeping even." This is failing, over time, despite the optimistic clean-up and recovery appearances in the short run after the point event of any single flood. In a context of declining material resources and community organizational capability for action, what of the resourcefulness of the individuals whose perceptions, attitudes and behavioral dispositions are - in creative and productive orientation - strongly influenced and set in their constraints by such contextual factors?

The clear implication is that the effective capacity of individuals for both self-sufficiency and contribution to growth and development decreases along with the material base and social infrastructure through which they must act to achieve those productive ends. In short, there is a downward "rachet" effect, a cumulative decline in the human resource capacity (capital) of the

sum of individuals, which parallels that of declining and deteriorating property.

What this downward curve in wealth, organizational capacity, and psychological perception of rational opportunity means for the de facto policy of emergency recovery is that, over the time span of recurring flood events, it is a sound projection to expect an ever-increasing cost level to recover an ever-declining resource in human capacities. There is some point of intersection in judgment consensus, if not precise measurement, where the cost becomes a welfare burden on behalf of a depleted, dependent population, and ceases to be an investment in recovery of the productive capacity of a viably organized socioeconomic system of individual skills, learning, abilities, and motivation. General indicators would suggest that this intersection of declining resources and rising public "recovery" costs (creating an inadvertent welfare policy toward flooding) is not far ahead in the Tug Fork Valley.

APPENDIX B

NATIONAL INSTITUTE FOR MENTAL HEALTH

DISASTERS AND MENTAL HEALTH

BIBLIOGRAPHY

DISASTERS AND MENTAL HEALTH:

AN ANNOTATED BIBLIOGRAPHY

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FOREWORD

The field of mental health, which has been concerned since the early nineteenth century with emotional problems experienced by the individual, in the latter part of the twentieth century has begun to look at those environmental forces outside of the individual which impinge upon his/her mental health. Extreme physical deprivation, as well as sudden, dramatic changes in the physical environment, can cause severe emotional stress especially among vulnerable populations of young, elderly and the mentally ill. The extent of this causal link, as well as intervention and prevention measures to minimize its effects, has been addressed systematically in recent years by mental health professional in programs of research, service delivery, and community planning.

Research sponsored by the National Institute of Mental Health and other public and private organizations include:

- studies of psychosocial response to acute life crises and emergencies including perception of environmental risks and the psychology of protective behaviors to avoid such risk;

- studies of the mental health implications of acute life crises for victims both old and young, for those close to them, and for disaster service workers who assist them and who themselves may become victims;

- studies of the design, implementation and evaluation of mental health services and treatment for children and adults and for their families;

- studies of community prevention programs to avoid victimization and community intervention programs to ameliorate mental health problems related to acute life crises and emergencies.

Service delivery programs sponsored by national, state or local entities have concentrated on large-scaled Presidentially-declared disasters. They have involved crises counseling for victims and their families, and are limited to short-term assistance even though research has indicated the possibility of long-term emotional consequences. These services have seldom been described in detail much less evaluated.

More recently, mental health input is being made into community planning programs to avoid or reduce emotional

sequela of disaster victimization. This is accomplished through the addition of mental health components in two types of programs: 1) programs to promote community awareness of specific roles that individuals may play in helping themselves and those close to them to avoid such emergencies altogether or to avoid most of their deleterious effects, and 2) programs to promote community interventions for reducing or ameliorating emotional trauma and long-term consequences of victimization. These planning activities also are yet to be evaluated.

In order to assist in these research, service delivery, and community planning activities, the Center for Mental Health Studies of Emergencies commissioned this compendium of the mental health literature of the last ten years as it relates to theories of human response to disaster, mental health implications of such responses for individuals and those close to them, and mental health intervention and prevention programs for disaster victims. By making available this information to researchers, service providers and public policymakers, the Center hopes to both speed up knowledge development in the area and assist on-the-spot planners in aiding individuals and communities in times of disaster. This monograph is seen by the Center as an important beginning ; its purpose if to encourage more activity in the field and careful evaluation of that activity to increase responsiveness to persons in need.

Mary Lystad, Ph.D.
National Institute of Mental Health

June, 1983

PREFACE

What happens to an ordinary, normal person who has experienced an extraordinary event? In recent years mental health professionals and researchers have shown considerable interest in studying the behaviors of people under situations of extreme stress and, at the same time, examining methods of giving psychological assistance.

Disasters cause individual and collective harm and loss. They may be sudden or gradual, short or long-lasting, unanticipated or anticipated, natural or man-made. Examples are earthquakes, tornadoes, floods, hurricanes, mud slides, fires, chemical hazards, and nuclear accidents. For the purposes of this volume, other types of personal or community catastrophes such as war, unemployment, crime or terrorism are not included.

As unfortunate as disasters are, they do occur with surprising regularity. A review of the literature documents that natural and man-made calamities are common to all societies producing social, psychological, physical and cultural consequences. Examined here are journal articles and books about disasters and their effects. Although there are some exceptions, abstracted materials have been published in the United States in the last twenty years. Disaster studies of a theoretical nature are reviewed first. This is followed by an examination of physical and mental health effects for individuals, families, groups and communities. Then, the process of coping with and recovering from disaster is analyzed from the perspective of individuals as well as families, groups and communities. The next section studies the social and organizational response to hazardous events and the nature of relief services available to disaster victims. Other sections are concerned with the provision of mental health services to victims and studies that emphasize prevention as they focus on planning, training and community education.

It is hoped that this extensive bibliography will encourage mental health professionals and researchers to explore further the psychological dimension of disaster and evalute the interventions to assist victims.

Particular thanks is due the Boston College Graduate School of Social Work for assisting in this endeavor. Carol Renaud deserves special recognition for her assistance in gathering and abstracting materials as do my workstudy students who performed many clerical tasks, and

my daughters who organized and typed the manuscript. Finally, a note of gratitude to Harold Goldstein for suggesting the idea of a bibliography in the first place and to Jean Garrison for her support, criticisms and comments.

Frederick L. Ahearn, Jr.
Boston College

June, 1983

PHYSICAL AND MENTAL HEALTH EFFECTS

INDIVIDUALS

41.
Abe, Kitao. The behavior of survivors and victims in a Japanese nightclub fire: a descriptive research note. MASS EMERGENCIES, 1(2):119-124, 1976.

On March 13, 1967, a fire in the Cabaret Playtown, a Japanese nightclub, killed 118, all but 22 of whom died as a result of smoke inhalation. A brief account of the disaster is given. Certain patterns of behavior engaged in by survivors and by those who perished are presented. The author indicates that the behavior of people attempting to survive may lead to the death of many others.

42.
Adler, Alexandra. Neuropsychiatric complications in victims of Boston's Cocoanut Grove disaster. JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 123(11):1098-1101,1943.

Following the Cocoanut Grove fire disaster of November 2, 1942, 131 patients were admitted to Boston City Hospital. Psychiatric observations were conducted on 46 of those patients who were seen in the acute stage and followed up later. Twenty patients did not develop any psychiatric complications, whereas 26 presented symptoms of nervousness and anxiety for at least three months. After nine months, 13 of the 26 with symptoms still suffered the same effects. Findings indicate that prolonged unconsciousness seems to be a factor in patients who did not develop psychiatric complications. Gender, loss of relatives/friends, and severity of burns appear to have no relationship to whether or not patients developed psychiatric complications. 12 references.

43.
Adler, Alexandra. Two different types of post-traumatic neuroses. AMERICAN JOURNAL OF PSYCHIATRY, 102(2):237-240,

1945.

The incidence of post-traumatic neuroses varies considerably since the development of psychogenic disturbance depends upon emotional factors related to the accident. Terrifying events, such as the Cocoanut Grove fire disaster in Boston, which have a higher incidence of neuroses traceable to the circumstances of the accident,are compared with everyday head injuries. "Fear neurosis" and "conflict neurosis"are differentiated. The former occurred in 54% of the Cocoanut Grove disaster victims and the latter in 33% of the head injury patients. No post-traumatic hysteria developed in either group. 15 references.

44.
Ahearn, Frederick L. Jr., Disaster mental health: a pre- and post-earthquake comparison of psychiatric admission rates. THE URBAN AND SOCIAL CHANGE REVIEW, 14(2):22-28, 1981.

The Managua, Nicaragua earthquake (December, 1972) is the basis for this case study. A comparison is made between pre- and post-earthquake admission rates (17,160 cases) to the Nicaraguan National Psychiatric Hospital and profiles developed by diagnostic category and region. Five hypotheses pertaining to post-disaster behavior are examined. Findings indicate that: 1)overall, when compared to past trends, there was no significant increase of admission rates; 2)individuals from areas most impacted by the earthquake experienced greater gains in admissions than people from non-impacted areas; 3)the most common post disaster symptoms were neurotic in nature; 4)those with a history of mental illness were particularly vulnerable to post disaster stress; and, 5)there was a time-lag in admissions,declining in the immediate aftermath and then increasing markedly for several years. The suggestion that researchers continue to test theories of disaster behavior by documenting responses over time is made as a means to further understanding of the emotional ramifications of disaster. 15 references.

45.
Belshaw, Cyril S. Social consequences of the Mount Lamington eruption. OCEANIA, 21(4):241-252, 1951.

In January 1951, the eruption of Mount Lamington in Papua caused 4000 deaths, the evacuation of 5000 inhabitants to refugee camps and the total destruction of Government and Anglican Mission stations. This catastrophe was a shock, not only to the physical and mental systems of the people who suffered it, but to the society as a whole. People were disturbed but not unduly frightened during the five days between the first signs of eruption and the devastating blast. The impact, with only a three minute warning, left people too numbed to panic. Good order was maintained and evacuation was rapid. As people settled, they began to seek for explantions and rumors spread. Most explanations were religious in nature,such as a belief that God had punished people for their sins. This sense of guilt is a most important factor in resettlement attitudes. Immediate relief measures could not replace the schools, staff, and pupils -- a critical loss. Worry and tension resulted in quarrelling and violence in the camps and villages, in part because families had been separated. It was assumed that all would be well as the period of reconstruction began; however, the situation remained unsettled.

46.
Bennet, Glin. Bristol Floods 1968. Controlled survey of effects on health of local community disaster. BRITISH MEDICAL JOURNAL, 3:454-458, 1970.

An investigation into the health of people in Bristol, England in which 3000 properties were flooded was made by means of a controlled survey of 970 persons (316 flooded and 454 not flooded) and a study of mortality rates. Each household was visited within two weeks of the flood, and again one year later; general practitioners' records were examined and hospital referrals and admissions were estimated. It was hypothesized that the general health of the flood victims would over the next year be less good than it had been the previous year; and less good than that of people who had not been flooded. In all aspects studied, the health of the victims was worse after the flood than the non-flooded group; and for older people there was an increased likelihood of death within twelve months. The increase in mortality probably means that death can be hastened by the disaster as well as be caused by it. A number of patients were referred for psychiatric care whose symptoms dated from the flood. All of them had been having difficulties in their lives prior to the flood and the flood was an added psychiatric burden to deal with. In all aspects, men appeared less well able to cope with the experiences of disaster than women. 16 references.

47.
Blazevic, D.; Durrigl, V.; Miletic, J.; Sartorius, N.; Stary, D.; Saric, M.; and Vidjen, R. Psychic reactions to a natural disaster. LIJECNICKI VJESNIK, 89(12):907-921, 1967.

In 1964, the Sava river flooded Zagreb, Yugoslavia, causing "inestimable damage" to the large city. Public health services intervened immediately after the disaster and continued for a year. Data on 7000 workers at a Zagreb factory were supplied by the factory's mental health dispensary, which encouraged workers to report physical and psychological difficulties. Immediately after the flood, the rate of absenteeism due to neurotic reaction increased, as did the relative number of cases of neurotic reaction reported at the dispensary. One year later the picture was not much different, but sources of help aside from the mental health dispensary had been available, so the lack of change is inconclusive. Findings indicate that the connotative significance of the notion "flood" varied between victims and non-victims, neurotics and non-neurotics. The size of the survey is too small to generalize, but this concept could prove useful in other studies.

48.
Boyd, S.T. Psychological reactions of disaster victims. SOUTH AFRICAN MEDICAL JOURNAL, 60(19):744-748, 1981.

Most people display transient signs of emotional disturbance immediately after a disaster. Recovery is dictated by one's personality and previous coping experience. Adult behavior is described during various disaster phases: 1) pre-impact: underactivity, failure to take precautionary measures, denial, fatalistic attitude (training and drills are important); 2) warning: overactivity, need for information (leadership is vital); 3) impact: 75% stunned and bewildered (normal), 10-25% confused, paralyzed by anxiety, hysterical, 10-25% collected and cool; 4) recoil: gradual return of awareness, anger, fear, loss of trust, dependency and anxiety due to shattering of illusion of invulnerability (need for ventilation); and 5) post-traumatic: activity, frustration, anger, search for scapegoat, grief reactions (need for support). Reactions manifested by death anxiety, survivor guilt, psychic numbing, loss of trust, impaired human relationships, psychological dependency and permanent

helplessness and despair appear in the survivor syndrome. Children may show signs of insomnia, clinging to parents, dependency or fear. The elderly react with a "high sense of deprivation". Relief workers need debriefing sessions to work out feelings of stress incurred by responsibility, role identification, and reactions to death and destruction. 23 references.

49.
Chamberlin, Barbara C. Mayo seminars in psychiatry: the psychological aftermath of disaster. JOURNAL OF CLINICAL PSYCHIATRY, 4(7):238-244, 1980.

Previous research on physical and psychological consequences of disaster gives evidence that long-term deterioration in health patterns and development of specific syndromes often occur in the aftermath. Psychological and environmental determinants of individual stress are discussed, as well as incidence and prevalence of these problems. Reactions to stress are determined by: 1) the meaning given the event by the individual; 2) support systems; and 3) past experience. Implications are drawn from the Buffalo Creek disaster. 42 references.

50.
Church, June S. The Buffalo Creek Disaster: extent and range of emotional and/or behavioral problems. OMEGA, 5(1):61-63, 1974.

On February 26, 1972, a dam burst flooding Buffalo Creek Valley, West Virginia, leaving 118 dead, seven missing,4000 homeless, destroying 500 homes, and resulting in $50 million in property damage. Many emotional difficulties were encountered such as: 1) problems with grief management; 2) insomnia; 3) fear of rain, thunder and loud noises; 4) overconcern with bodily functions; 5) survival guilt feelings; 6) amnesia; and 7) eating problems. Families became hostile, resentful, and depressed as a result of their placement in overcrowded trailer parks where there had been no concern for natural community grouping, and where victims had no part in decision making. After presenting four case studies of psychological problems and therapeutic intervention techniques, suggestions are offered in terms of alleviating emotional stress resulting from disasters. These include: 1) natural grouping of survivors in shelters and/or temporary housing; 2) use of ombudsmen; 3) continuation of in-service training; and 4) creation of mobile crisis

intervention mental health teams for both consultation and implementation of preventive strategies.

51.
Dalitz, E. Ruth. Personal reactions to natural disasters. In: Heathcote, R.L. and Thorn, B.G.,eds. NATURAL HAZARDS IN AUSTRALIA. Canberra: Australia Academy of Science, 340-351, 1979.

This article describes the author's personal experiences as a victim of fire, drought and flood disasters. Reactions during all phases are discussed with particular emphasis on the inadequacy of measures during the relief and rehabilitation phases. Reasons for feelings of hostility and anger are suggested, such as poorly organized relief operations, search for a scapegoat, self-interest of victims, and failure of friends to carry through with promises of help. It is recommended that all persons likely to be involved in disaster assistance receive training in effective communication techniques, and that studies be conducted on the long-term effects of disasters. More effort needs to be be expended on promotion of disaster education, mitigation nd preparedness.

52.
Drayer, Calvin S. Psychological factors and problems, emergency and long-term. THE ANNALS OF THE AMERICAN ACADEMY, 309:151-159, 1957.

Characteristic reactions of persons during the pre-impact, impact, and post-impact phases of disaster is the focus of this work. These include: 1)pre-impact phase--quarrels, apathy, and tension; 2)impact phase--pointless rushing about and continued apathy: 3)post-impact phase--excessive talking, withdrawal, guilt, and bodily disturbances. Although knowledge of adaptation to disaster situations is limited, certain procedures for reducing the shocks is indicated. Reactions to stress, psychological preparation for disaster, the recurrent disaster, "acts of God", information about relief,and aids to recovery are also discussed. It is suggested that preparation, especially where disasters are recurrent, will do much to eliminate panic, scapegoating, and rumormongering. Also it is important that workers assist victims in understanding that these reactions are normal

53.
Edwards, J. Guy. Psychiatric aspects of civilian disasters. BRITISH MEDICAL JOURNAL, 1(6013):944-947, 1976.

Most people exhibit signs of emotional disturbance immediately after a disaster, but usually recover spontaneously or with a little help depending upon their personality and previous life experiences. At impact, 12-25% of victims are calm, 75% are stunned and bewildered, and 10-25% may be confused, paralyzed, or anxious. During recoil, there is a gradual return of awareness, dependency, and need to be with others and to ventilate feelings. The reactions of the post-traumatic period include anxiety and depression as victims come to terms with loss and bereavement. Anger may be individual or collective, as displayed in scapegoating. Some victims feel guilt because they survived or failed to do their best during the rescue phase. Defensive reactions may appear in the form of intellectualization, humor, and inappropriate talk. Panic is uncommon and occurs only when there is immediate threat to one's life with escape expected to be impossible. In recurrent disasters, fear and anxiety states predominate. Childrens' reactions include separation anxiety, fear, restlessness, irritability, temper, dependent and demanding behavior, enuresis, school phobia and guilt. However, children are remarkably resilient. The elderly feel the loss of symbolic assets and destruction of time. 35 references.

54.
Erikson, Kai T. EVERTHING IN ITS PATH. New York: Simon and Schuster, 1976.

Human wreckage was what remained in the wake of a devastating flood which tore through the coal mining community of Buffalo Creek, West Virginia on February 26, 1972. The catastrophe resulted in 125 deaths and the destruction of hunderds of homes. In an attempt to help the survivors collect money for psychological damages in a court action suit, it was necessary to learn what the flood meant to survivors and how it affected the course of their lives. The suit was directed against the Pittson Corporation, owner of the Buffalo Mining Company, which was responsible for the buildup of slag and waste which inundated the community. The report is clinical in nature as it describes individual trauma. Of the 615 survivors examined one and one-half years after the flood in connection with the legal action, 570 were found to be suffering from an emotional disorder. This finding is

historical in that it locates the event in its own time and place; and sociological in that it deals with collective trauma (loss of bonding and communality in which survivors suffer from demoralization, disorientation, loss of connection and a sense of vulnerability). The plaintiffs were ultimately awarded $13.5 million from the coal company, but it is clear that the wounds have not yet healed. 18 references.

55.
Erikson, Kai T. Loss of communality at Buffalo Creek. AMERICAN JOURNAL OF PSYCHIATRY, 133(3):302-305, 1976.

The 1972 Buffalo Creek slag flood killed 125 persons and permanently disrupted the lives of the 4000 survivors. They suffered not only individual, but also collective trauma- damage to the fabric of community. Its effects were delayed until the rebuilding phase. After the destruction of the social network and hasty resettlement, victims perceived new neighbors as less moral than themselves. They experienced spatial and temporal disorientation, apathy, feelings of hopelessness and separation. They were unable to relate to other family members, much less make new relationships. The area's ethic of neighborliness and kinship held community members together and served as a source of collective strength in time of need. When this ethic fell apart as a result of the resettlement, victims felt isolated and were unable to substitute personal strengths for community strength in order to rebuild their own lives.

56.
Farber, Irving J. Psychological aspects of mass disasters. JOURNAL OF THE NATIONAL MEDICAL ASSOCIATION, 59(5):340-345, 1967.

A number of mass disasters are discussed in terms of various reactions and degrees of stress. Of the six million people who heard the October 30, 1938 radio production of the Martian invasion, at least one million were frightened, disturbed or panic-stricken. Observations reported after the Andrea Doria-Stockholm collision at sea on July 25, 1956 included an initial helpless dependency, passive compliance and a readiness to overestimate the powers of those in a position to offer help (disaster syndrome) after which an attempt was made to master the experience through the use of repetitive narration. Somatic disturbances in the form of insomnia, headaches,

and digestive upsets may occur during this phase, followed by the overt expression of prejudice and paranoid attitudes. The need to find a scapegoat is universal. There appears to be a gradient of the paranoid attitudes that seems related to: 1) the pre-morbid personality; and 2) the degree of stress. Denial and projection are keystones in the paranoid personality organization and it is these mechanisms that the disaster victim may show- for most, only temporarily. Minimal emotional reactions are evident in children who are with a parent during the disaster. The importance of prompt leadership, maintenance of survivor lists and task assignments for survivors are indicated. 12 references.

57.
Feld, Allen. Reflections on the Agnes Flood. SOCIAL WORK, 18(5):46-51, 1973.

On June 20, 1972, a flood caused by tropical storm Agnes hit the Wyoming Valley in Pennsylvania, resulting in only two deaths but damaging or destroying 23,500 dwellings. The cost in property loss was staggering and the personal suffering tied to this economic loss, along with the emotional attachment to one's possessions, was equally real and immeasurable. Some reflections of a flood victim, who is also a professional social worker, are presented with emphasis on buying new things as a result of the disaster. The emotional strain of suffering a significant economic and sentimental loss and of being uprooted and separated from family and friends, coupled with the enormous physical effort of clean-up, have a varying effect on people. For most, the emotional effect is short-term, while the economic effect can be potentially long-term. The economic relief and help offered the victims seem to be consistent with the value system that labels property loss in a disaster. Although there was universal eligibility for some Red Cross grants and food stamps, feelings of ambivalence existed for those requesting aid for the first time- even though for flood victims it was the norm. Two major conclusions are: 1) flood victims receive better treatment than welfare recipients; and 2) programs tend to return people to relative positions they had prior to the disaster. 3 references.

58.
Friedman, Paul and Linn, Louis. Some psychiatric notes on the Andrea Doria Disaster. AMERICAN JOURNAL OF PSYCHIATRY, 114(November):426-432, 1957.

On July 25, 1956, the Swedish liner Stockholm crashed into the Italian liner Andrea Doria resulting in one of the worst maritime disasters ever. The survivors were taken aboard the Ile de France and were observed and interviewed by two psychiatrists who were passengers. Initially, the survivors appeared passive and compliant. They also displayed psychomotor retardation, flattening of affect, somnolence, and sometimes amnesia. They were nonchalant and easily suggestible. After the initial shock had worn off, the survivors had a great need to tell their story in a repetitive fashion to anyone who would listen. In order to attempt to master the overwhelming trauma, many looked for a scapegoat. The tendency was to blame the Andrea Doria, even though the crew acted with generosity and even heroism. A severe listing of the ship immobilized and isolated groups creating a need for leaders within each group in order to prevent mass hysteria. Children were separated from parents; and the lack of an official list of survivors contributed to the delay in reuniting separated families causing greater emotional problems. 14 references.

59.
Gleser, Goldine C.; Green, Bonnie L.; and Winget, Carolyn N. Quantifying interview data on psychic impairment of disaster survivors. THE JOURNAL OF NERVOUS AND MENTAL DISEASE, 166(3):209-216, 1978.

In the litigation between survivors of the Buffalo Creek flood and the company responsible for the dam break, two psychological reports were prepared for each of 381 adult plaintiffs, one by the defense's neuropsychiatrist and one by the prosecution's psychiatric team. The purpose of the study was to determine the relationship between stress related to the disaster and long-term psychosocial impairment. The two sets of reports are compared for similarity of symptom patterns. Each report was rated for manifest psychopathology, using the standard psychiatric evaluation form, by trained raters. Though the interpretation of causes of impairment differed greatly between the two sets of reports, similar symptoms were reported: anxiety, hostility, social isolation, disruption of routine, and somatic concerns. The reliability of the standard evaluation form, carefully applied and analyzed, will prove useful in correlating factors in the disaster with certain aspects of psychosocial impairment. 12 references.

60.
Kafrissen, Steven R.; Heffron, Edward F.; with Zusman, Jack. Mental health problems in environmental disasters. In: Resnik, H.L.P.,and Rubin, H.L., eds. EMERGENCY PSYCHIATRIC CARE. Bowie, Maryland: The Charles Press, 1975, 159-169.

As disasters are defined as crises, the normal and predictable emotional responses through the stages of the crisis (alarm, threat, impact, inventory, rescue, remedy and restoration) and the common elements which affect the counter-response of various helping agents are described. In assessing the recovery effort, five factors are discussed: 1) anxiety vs. panic; 2) finding and accepting help; 3) disruption of natural social groupings; 4) reaction to "outsiders"; and 5) effects on the family. Guidelines are provided for dealing with a disaster-stricken community. Advance training is indicated as a way of eliminating many potentially negative psychological effects by helping to decrease stress on workers while insuring increased sensitivity to the emotional status of victims. Project Outreach (Wilkes-Barre Flood) is used to illustrate effective training and use of indigeneous workers. Training and knowledge in disaster recovery at all levels--community, state and national--are encouraged.

61.
Kartman, Ben and Brown, Leonard. DISASTER. New York: Pellegrini and Cudahy, 1948.

Outstanding American disasters (1811-1946), representative of the types of catastrophe which strike without warning, and often without reason, are discussed in detail. The accounts are arranged chronologically for the sake of continuity and to illustrate the changing patterns of American disasters throughout the years. The forty-six accounts are assembled in terms of people--their sufferings, heroism, miraculous escapes--rather than through cold, impersonal statistics. It is noted that people react in different ways to great catastrophes. Some battle for their lives with the brutal selfishness of animals, while others risk their lives to rescue others. Frantic rescue attempts, panic among frenzied crowds trapped in fires, looting, and failure of people to evacuate when warned, as well as the hard work and self-denial of citizens to rebuild their communities and defend themselves from future attacks are topics which are examined. As a result of these disasters, more attention is

paid to safety by new legislation, more exacting safety requirements, and more stringent inspection. A supplementary list of 223 American disasters (1618-1948) is outlined along with a brief summary of essential facts about each. Included in the list are plagues and epidemics, natural disasters, fires and explosions, and aviation, railroad and marine disasters. 269 references.

62.
Kendrick, T.D. THE LISBON EARTHQUAKE. New York: J.B. Lippincott Co., 1955.

On November 1, 1755, a colossal seismic disturbance shook the entire southwest corner of Portugal resulting in catastrophic destruction in which over 60,000 people were killed. Lisbon, the capital of Portugal, was ruined. Much of the material wealth of the city which might have been recovered from the earthquake ruins was lost in the ghastly fires and devastating tidal waves that followed. Mobs of hysterical people began an immediate exodus from the city. Eighteenth century earthquake-theology (demonstration of God's anger towards evil people) and the end of optimism are described as well as miraculous happenings, healings and escapes and prophecies of more misfortunes to come. Brief after-shocks kept the hysterical fright alive and seemed to justify the predictions of those prophets of woe who claimed that God had not yet completed the punishment of the sinful city of Lisbon. It is noted that, despite organized efforts, the mechanical task of recovery was of little importance compared with the duty of making peace with God and imploring Him to end the punishment. Various philosophies concerning God's revenge and the earthquake are described, among them Voltaire, Rousseau, Kant, Oliveira and Bertrand. 36 references.

63.
Kinston, Warren and Rosser, Rachel. Disaster: effects on mental and physical state. JOURNAL OF PSYCHOSOMATIC RESEARCH, 18(6):437-456, 1974.

A psychiatric approach to disaster is developed through an extensive literature review and suggestions for future planning services are offered. Disaster is defined, methodology is discussed, and examples are provided (case reports, and anecdotal, systematic, and experimental studies). Case discussions include the Cocoanut Grove fire (1944); a marine explosion on the Delaware River (1957); and the Skopije, Yugoslavia earthquake (1964).

Psychological phenomena of the threat, impact, recoil, and early aftermath phases are summarized. These consist of the following: 1)threat--denial; 2)impact--illusion of centrality, personal invulnerability, disaster syndrome behavior; 3)recoil--return of awareness and recall, emotional release, and convergence behavior; and, 4)early aftermath--organized social response and individual grief reactions. Present knowledge on management, prevention (primary, secondary, tertiary) and special groups (aged, children) are discussed. The impacts of some exceptional stresses of World War II, including war neuroses, concentration camp effects, and Hiroshima A-bomb effects,are mentioned in terms of understanding long-term outcomes of disaster. Finally, responses to stress and the planning of future services are reviewed. 117 references.

64.
Langdon, J. Ray and Parker, Allen H. Psychiatric aspects of March 27, 1964 earthquake. ALASKA MEDICINE, 6(2): 33-35, 1964.

A preliminary report concerning the psychiatric aspects of the 1964 earthquake in Alaska is presented. Psychiatrically, the first concern at the time of a disaster is the amount of panic developing which may cause more physical casualties, hamper rescue operations, or paralyze vital functions. In the Alaskan earthquake, there was no panic and the community was not damaged by this reaction. During the next phase, people worked vigorously at surviving or getting their living conditions under some control; little time remained for emotional expression. People removed themselves, as if to another planet, or slept excessively. At this point, anger may begin to show itself in multiple forms. It is basically against the natural disaster itself, but rationalizd toward the nearest vulnerable target- God, spouse, government officials, children. This may be expressed as chronic irritability, violent outbursts, or carping criticism. A period of depression may follow, massive fatigue may become evident, and victims will seek out similar victims (loss of home). In Alaska, differences in disaster reactions may have been due to inexperience,ignorance and isolation. Some increase in anxiety was noted in unaffected communities probably due to possible economic repercussions. Humor as a defense mechanism was noted within hours both in oral funny stories and comic signs. Mentally ill patients were not affected.

65.
Leopold, Robert L.; and Dillon, Harold. Psycho-anatomy of a disaster: a long term study of post-traumatic neuroses in survivors of a marine explosion. THE AMERICAN JOURNAL OF PSYCHIATRY, 19(April):913-921, 1963.

The immediate psychological effects of a maritime explosion on thirty-six survivors and the long term effects on thirty-four who were seen three and a half to four and a half years later are explored. Immediate effects, mood and affect disturbance, sleep difficulties, and somatic reactions were appropriate to the circumstances, but subsequent investigation three years later indicated appreciable deterioration in seventy-one percent of the survivors. The long term psychological pictures were strikingly similar for all subjects. 16 references.

66.
Lifton, Robert Jay. Psychological effects of the atomic bomb in Hiroshima: the theme of death. DAEDALEUS 92(3):462-497,1963.

Individual interviews were conducted with two groups of atomic bomb survivors: thirty-three randomly selected and forty-two specially selected because of their familiarity with A-bomb problems or their ability to articulate their experiences. An attempt is made to determine the degree to which exposure to the atomic bomb in Hiroshima resembles psychological and social patterns common to all disasters, and ways in which it might be a unique experience. Several cases illustrating these physical and psychological effects show the usual emotional patterns of disaster, and also several unique psychological effects, such as: 1) continuous encounter with death; 2) breakdown of faith in larger human matrix supporting each individual life, and therefore a loss of faith in the structure of existence; 3) psychic closing off; and 4) psychological mastery of the nuclear disaster experience-like "existential guilt". Radiation caused immediate physical symptoms; the resulting anxieties concerning illness and death became a lifetime preoccupation,having an impact on subsequent generations. 29 references.

67.
Lifton, Robert Jay. DEATH IN LIFE: SURVIVORS OF HIROSHIMA. New York: Random House,Inc.,1967.

Nuclear weapons left a powerful imprint upon the Japanese which continues to be transmitted, historically and psychologically, through the generations. An attempt is made to record the most important psychological consequences of exposure to the atomic bomb in Hiroshima in which 200,000 persons were killed. The predominant general tone was that of extreme surprise and unpreparedness on many psychological dimensions. There is discussion of survival guilt, death-imagery, feeling of death in life, disruption of individual and social order, "psychic closing-off", survival priority, failed responsibility, feelings of abandonment, self-condemnation, images of ultimate horror, hate and self-hate. There is also discussion of A-bomb disease, denial and transcendence, counterfeit nurturance, and residual struggles of trust, power and mastery. Finally, the basis for all survivor themes, the imprint of death is discussed as well as death guilt, psychic numbing, nurturance and contagion, and

formulation. The atomic survivor experiences the same general psychological themes as do all survivors of massive death immersion, but the unique features of nuclear weapons and of the world's relationships to them give a special quality to their survivorhood. 200 references.

68.
Lifton, Robert Jay. THE BROKEN CONNECTION. New York: Simon and Schuster, 1972.

This book has a twofold task: 1) it seeks general principles concerning death imagery and struggles for continuity. These principles are applied to exploration of the individual life cycles, the varieties of psychiatric disorder, and aspects of the historical process; 2)it also considers some of the consequences of our imagery of extinction. The effort throughout is to press toward integrating principles that can have meaning for psychological work and general living in our time by exploring the place of death in the human imagination, and its bearing on our sense of endings, changes, and beginnings. Four sections are included: 1) Death and Immortality; 2) Death and Emotion--Psychiatric Boundaries; 3) Death and History--The Nuclear Image; and 4) Awareness and Renewal. Examined are anxiety and numbing, guilt, anger, rage and violence; the survivor experience and traumatic syndrome; depression; disruption and neurosis; schizophrenia; and suicide. A description of the Hiroshima survivors is included. It is noted that the survivor of disaster faces several formidable problems concerning guilt. As a result of witnessing death in random, absurd, grotesque, and often man-made situations, the survivor's basic commitments and images concerning life's reliability and significance are threatened. They become susceptible to guilt over survival priority and their debt to the dead can become permanent and unpayable. Relief and joy at being alive, an emotion central to human experience, is often unacceptable to the survivor. It is concluded that continuity between life and death must not be denied if we are to function as fully realized human beings. 300 + references.

69.
Lifton, Robert Jay and Olson, Eric. Death imprint in Buffalo Creek. In: Parad, Howard J.; Resnik, H.L.P.; and Parad, Libbie G., eds. EMERGENCY AND DISASTER MANAGEMENT: A MENTAL HEALTH SOURCEBOOK. Bowie, Maryland: The Charles Press Publishers, Inc., 1976, 295-308.

The authors were asked to consult on the psychological effects on the survivors of the 1972 Buffalo Creek, West Virginia flood. The five manifestations of the survivor syndrome are discussed, including death imprint and death anxiety, death guilt, psychic numbing, impaired human relationships, and significance of disaster to the individual. The uniqueness of this disaster was due to its suddenness, isolation of the community, totality of community destruction, the callousness and irresponsibility of other persons, and the continuing relation of survivors to the disaster. Disaster trauma was total and overwhelming. The fact that virtually everyone exposed to it underwent adverse psychological effects makes clear that predisposition can only add to those effects but never be the cause of the states observed. It is further indicated that the high percentage of clinical psychiatric symptoms is tragic testimony to the causative influence of the disaster itself. It is concluded that the mental health crisis in Buffalo Creek and the psychological suffering of each individual in association with that crisis are direct results of the catastrophe.

70.
McGonagle, Laurence C. Psychological aspects of disaster. AMERICAN JOURNAL OF PUBLIC HEALTH, 54(4):638-643, 1964.

The psychological aspects of disaster are presented along with some common misconceptions such as the prevalence of panicky reactions. The dominant emotion appears to be fear--the individual's ability to cope with fear determines the effectiveness of actions taken. Reactions to disaster are discussed including disbelief, myth of personal invulnerability, illusion of centrality, feeling of abandonment, and family importance. Stunned, dazed, or shocked behavior is a typical reaction in the immediate post-impact situation. Only 15% may take a day or longer to achieve some semblance of purposive behavior; most behavior is adaptive even though initially at a lower level. Preparation and training, warning, communication, leadership, awareness of skills and group identification help relieve the crippling effects of fear. Early treatment of disturbed victims prevents prolonged problems and is accomplished by encouraging victims to ventilate, rest, and accept their feelings as normal. 19 references.

71.
Moore, Harry Estill and Friedsam, H.J. Reported emotional stress following a disaster. SOCIAL FORCES, 38(2):135-139,

1959.

The possibility of long-run emotional effects of disaster is studied with reference to the view that immediate effects do not last. In June 1957, a questionnaire was administered to 142 victims of a tornado which had struck Dallas, Texas in the spring of 1957. The damage (ten deaths, two hundred injuries, and four million dollars worth of property damage) was confined to a poor area of town where most residents were black. Seventy-two percent of respondents were women. The key question was, "Has any member of your family been nervous or upset because of the tornado?". Answers were correlated with all other responses to isolate significant factors in stress. Sensitivity to the emotional needs of others and of self seems to be the mechanism that caused respondents to report emotional upset, most often their own. Women reported their own upset more often than men, perhaps as a result of cultural influence. Further conclusions as to who is stress-prone cannot be drawn, but the study supports the thesis that emotional stress is in fact a long-run effect of disaster.

72.
Oliendick, Duane G. and Hoffman, Sister Margeen. Assessment of psychological reactions in disaster victims. JOURNAL OF COMMUNITY PSYCHOLOGY, 10(2):157-169, 1982.

On July 5, 1978, one third of the city of Rochester, Minnesota was flooded, killing five persons, causing 734 families to find temporary housing and resulting in over $70 million in total flood damages. The initial attempt to systematically collect data on the emotional adjustment of flood victims using pre-post paradigms rather than retrospective studies is described. Findings from a random sample of 124 adults and 54 children showed the following: 1)adults perceve themselves to be significantly more depressed and stressed in areas such as adaptation and physical complaints; and,2)there is a higher percentage of positive change among persons who obtain different housing. Childrens' results were mixed, depending on age, although problems existed concerning sleep difficulties, fears and behavior changes. It is recommended that: 1)community mental health centers become more involved in disaster services; 2)religious leaders should be more attuned to heightened spirituality following a calamity; 3)more attention be given the physical needs of the elderly; and,4)further empirical work in the assessment of post-disaster emotional sequalae be implemented. Planners

need to prepare for the possibility of disaster in their community. 19 references.

73.
Parker, Gordon. Psychological disturbance in Darwin evacuees following Cyclone Tracy. THE MEDICAL JOURNAL OF AUSTRALIA, 1(21):650-652, 1975.

Following Cyclone Tracy, sixty-seven evacuees from Darwin, Australia were given an objective test, the General Health Questionnaire. The purpose of the test was to measure psychological disturbance caused by the stress of the cyclone and subsequent evacuation. Results demonstrate that the mean level of disturbance decreased as the evacuation process progressed. This may have been due to: 1)an abatement of disturbances; 2)the speculation that later evacuees were less depressed; or 3) a combination of factors. Fifty-eight percent of the subjects were scored as "probable psychiatric cases" when tested five to eight days after the cyclone. Psychological disturbances increased with age and were more pronounced in females. Although evacuees often experienced anxiety, mild depression, sense of inadequacy, loss of autonomy and mastery, and an increase in socialization, they rarely experienced a deep depression or suicidal preoccupation. 6 references.

74.
Penick, Elizabeth C.; Powell, Barbara J.; and Sieck, William A. Mental health problems and natural disaster: tornado victims. JOURNAL OF COMMUNITY PSYCHOLOGY, 4(1):64-67,1976.

The small town of Joplin, Missouri (population 40,000) experienced a tornado in the Spring of 1973. Loss of life and injury were low (two and eighty-seven respectively), but over half the residents suffered property damage, averaging about $4,000 per family. Most of the twenty-six interviewees cited financial trouble as the primary problem. Interpersonal strain, nervousness and other symptoms were perceived by a vast majority to be natural,temporary, and linked to their financial distress. Thus, need for social services from profesionals was rated very low. Despite the small sample and retrospective, self-reported design of the study, other studies have arrived at comparable conclusions. 4 references.

75.
Perlberg, Mark. Trauma at Tenerife: the psychic

aftershocks of a jet disaster. HUMAN BEHAVIOR, 8(4):49-50, 1979.

On March 27, 1977, two jumbo jets collided on the runway at Tenerife in the Canary Islands, Spain. The accident resulted in 580 deaths. Three standardized psychological tests were administered to eight survivors in an attempt to discover symptoms of traumatic neurosis. Up to five months after the catastrophe, victims exhibited several symptoms of traumatic neurosis, including anger and rage, sleep disturbances, and repeated dreams of the event. Working with an admittedly small sample, the study's purpose was to demonstrate that trauma neurosis does not fade away soon after a disastrous event.

76.
Popovic, M. and Petrovic, D. After the earthquake. THE LANCET, 2(7370):1169-1171, 1964.

This descriptive account records observations of the effects of an earthquake (on July 26, 1963) on residents of Skopije (population 200,000), the capital of Macedonia in Yugoslavia. Destruction to property, including public services, was extensive; 1070 persons died, 3300 were injured, and two-thirds of the residents evacuated within days. Belgrade's Institute for Mental Health sent an intervention team which visited the twenty-seven evacuation camps and helped evacuate the most seriously ill psychiatric patients to intact facilities. Initial emotional manifestations consisted of mild stupor, with puerile behavior and an urge to group. Rumors that the earthquake was a punishment were circulated. Depressive reactions and anxiety set in two to three days after the quake. Severe psychotic disturbance was rare due to efficient screening and responsible media conduct. It was noted that mental disturbances were less common than in other catastrophes. This could be attributed to: 1)collective identification of the population; 2)the systematic evacution; 3)the prompt and resourceful assistance from outside; and 4)the objective and responsible coverage by the media.

77.
Quarantelli, Enrico L. Images of withdrawal behavior in disasters: some basic misconceptions. SOCIAL PROBLEMS, 8(1):68-79, 1960.

Misconceptions of withdrawal behavior of disaster victims is studied from the perspective of persons/organizations involved in control and relief activities. Panic, dependency and control are discussed. Findings indicate that even under severe stress, people do not panic or become totally dependent, but rather work out their own private withdrawal arrangement. It is noted that concern over evoking panicky responses sometimes hinders the alerting of people to possible changes. It is also noted that the "disaster syndrome" appears only in the more traumatic types of disasters, is confined to the post-impact period, and is of short duration. Scientific studies of disasters show that, at best, outside agencies impose an insignificant control on the withdrawal behavior of victims. It is concluded that although evidence depicts more social or community rather than personal disruption, disasters do not create situations of total anomie. 50 references.

78.
Rangell, Leo. Discussion of the Buffalo Creek disaster: the course of psychic trauma. AMERICAN JOURNAL OF PSYCHIATRY, 133(3):313-316, 1976.

Plaintiffs in the Buffalo Creek flood who claimed psychic trauma are the subject of this report. The analysis divides psychic trauma into three phases. These are as follows: 1) psychic numbness: psychic overload due to occurrence of a feared and repressed event that resulted in apathy,withdrawal,and the primacy of survival. This was still evident two years after the flood. 2) "Ground" and "Surround": relocation away from one's familiar surroundings resulting in prolonged and aggravated trauma. Being in a vulnerable state, victims required rest and nurturance, not change. 3) Future effects of trauma: Questions raised are: will victims be obsessed by the disaster, leaving no room for normal functions? Will "death imprint" impact small children? How will the human error responsible for the disaster complicate responses? Will victims cleave to trauma, turning away from trust in others? One predictable consequence is that preexisting psychoneuroses will begin to emerge and perpetuate the traumatic state. 18 references.

79.
Rosenman, Stanley. The paradox of guilt in disaster victim populations. THE PSYCHIATRIC QUARTERLY SUPPLEMENT, 30:181-221, 1956.

An attempt to discover the reasons for the omnipresence of guilt in a disaster population is made by studying the meanings of disaster upon depth levels of the individual's mental functioning. The double toll the victim often pays to the disaster is pointed out: 1) actual bereavement, terror and loss; and 2) abject need for self-harassment, to alleviate irrational and unwarranted guilt which may endure for a long time after the disaster. All too often, a dejected apathy-defense against, expression of, and atonement for the guilt debilitates the individual long after the disaster has passed, lacerating anew unhealed wounds, and curtailing any effort at improvement of the situation. Examples of personification of disaster in literature are described, as well as fantasies inspired by disasters which rouse the experience of guilt often indicated by intense religious devotion. The horror, hardships and helplessness which accompany disaster are all frustrations well calculated to arouse hostility against authorities, peers and victims. The anger, conflicting with the individual's internalized norms, leads to guilt which, in turn, feeds the rage directed at the object. Almost all serious publications dealing with disasters affirm the pervasiveness of guilt feelings in the reactions of the populace to community disaster situations. 38 references.

80.
Schanche, Don A. The emotional aftermath of "the largest tornado ever". TODAY'S HEALTH, 52(8):16-19, 61, 63-65, 1974.

On April 3, 1974, a catastrophic storm devastated Xenia, Ohio, killing thirty-two persons, injuring 2500, damaging 2757 homes, and totally destroying 1095 others, creating emotional problems which were still evident three months later. Despite the fact that most residents survived unharmed, they also suffered psychological problems. Direct victims displayed symptoms of anxiety, anger, fear of another tornado, depression, and an inability to cope. Indirect victims often felt guilty that they escaped harm and experienced stress-induced physical symptoms, accidents,and arguments with family and friends. Several weeks after the tornado, a severe wind and rainstorm struck Xenia and resulted in many nervous reactions. In order to minimize long-range psychological effects, the city implemented a program to reduce community and individual anxiety through the use of mental health workers, clergy, police, teachers, bartenders, barbers, beauticians, and businesspersons.

81.
Spiegel, John P. Emotional reactions to catastrophe. AMERICAN PRACTITIONER, 5:14-23, 1954.

In a catastrophic event, one feels both physical pain and mental suffering in the form of anxiety. The individual is in danger of being overwhelmed by emotions--fear, anxiety, rage or grief. Unable to master them, the individual may not be able to act effectively; however, many manage to control themselves and act rationally in crisis situations. Another common initial reaction is panic, characterized by: 1) sheer terror in which the victim is paralyzed and powerless to move; 2) running; 3) aggression and hostility; 4) vague mental confusion or severe passivity; and 5) apathy. The most that anyone can do under such circumstances is to help the victim express feelings about the catastrophe itself. By ventilating feelings, the victim can digest the experience. Some ways in which the ego can defend itself against the experience which is not expressed are discussed, such as: 1) forget about it--anxiety remains; or 2) development of physical symptoms--psychosomatic disturbances. Anxiety is reduced by means of group relations and communication.

82.
Stern, Gerald M. Disaster : Buffalo Creek: from chaos to responsibility. AMERICAN JOURNAL OF PSYCHIATRY, 133(3):300-301, 1976.

As a result of the loss and destruction caused by the 1972 Buffalo Creek Flood, 625 survivors formed a group, obtained legal counsel, and sued the coal company that owned the dam for psychological damages. The law firm representing the survivors obtained the services of a team of psychiatrists from the University of Cincinnati, and Dr. Robert J. Lifton to deal with the psychological injuries of the survivors, and Dr. Kai Erickson to report on loss of communality or the sociological aspects of the disaster. The physician retained by the coal company claimed that those survivors still suffering from emotional disturbances eighteen months after the flood were actually suffering from preexisting mental conditions. The survivors' psychiatrists claimed that their psychic damages were caused solely by the flood. The lawyer for the plaintiffs argued that all survivors, whether physically affected by or even present at the time of the flood, were victims of the coal company's reckless conduct and therefore entitled to recover for their mental suffering. Upon realization that the court would not dismiss the psychic impairment claims of the survivors, a settlement of $13.5 million was reached. After payment for property losses, deaths, lost wages, etc., $6 million was left to be distributed for psychological damages according to a point system. A significant legal precedent for recovery in cases of mental suffering was established.

83.
Takuma, Takitoshi. Human behavior in the event of earthquakes. In: Quarantelli, Enrico L., ed. DISASTERS: THEORY AND RESEARCH. Beverly Hills, California: Sage Publications, Ltd., 1978, 159-172.

Since 1964, a group composed of behavioral and social scientists, primarily psychologists, has been studying human behavior in the event of earthquakes. Researchers went to several stricken areas within a few weeks of the disasters. Their techniques consisted of individual and group interviews and questionnaires. The areas included: 1) Niigata--June 16, 1964 (thirteen deaths; 315 injuries; 1448 houses destroyed, 5396 damaged; 14900 submerged); 2) Matsushiro--August, 1965 (great economic damage); and 3)

Ebino--February 21, 1968 (three deaths; forty-five injuries; 386 houses destroyed, 858 damaged). It has been noted that people naturally become frightened and anxious when an earthquake strikes unexpectedly. Pre-disaster training in fire fighting and evacuation techniques, as well as allotment of specific roles to victims, are indicated as effective countermeasures. Confusion and rumor can be prevented by dissemination of accurate information. Victim reactions consisted of fear, anxiety and confusion, need for information, development of rumors, complaints of ill health, and a reluctance to evacuate if family is not together. It is suggested that families make arrangements concerning place of evacuation and develop an awareness of what to do upon arrival at the shelter.

84.
Taylor, James B.; Zurcher, Louis A.; and Key, William H. TORNADO. Seattle, Washington: University of Washington Press, 1970.

On June 8, 1966, a tornado struck Topeka, Kansas, killing seventeen persons, injuring 500, rendering 1600 homeless, and resulting in property damage amounting to over one hundred million dollars. Behavior is analysed from a microscopic focus on individual response to a macroscopic focus on historical behavior under conditions of stress. The individual actors in the disaster drama--the victims and nonvictims--are described. How their reactions led to the emergence of novel group phenomena (work crews), and how group and mass behavior, in turn, was conditioned by pre-existing social structures is also examined. Psychologically, victims are viewed through their motivational mechanisms which underlay different kinds of reactions, such as the zombie-like "disaster syndrome", the rarer syndrome of disaster elation, and the stoic response. Socially, the role of being a victim is studied with its own particular attributes, expectations and stresses. Finally, this research, personalistic and highly case-centered, suggests ways in which individual and group reactions influenced the working of social agencies and institutions. The similarities and differences are contrasted between these observations and those reported from other disasters, related to the social processes which call forth collective behavior. 78 references.

85.
Taylor, Verta A. Good news about disaster. PSYCHOLOGY TODAY, 11(5):93-94,124-126,1977.

When a tornado struck the city of Xenia, Ohio on April 3, 1974, it killed thirty-three persons, injured 1200, and caused severe damage to personal property and the local economic infrastructure. A field team from the Disaster Research Center of Ohio State University arrived four hours after impact and initiated an eighteen month project to study the short-and long-term effects on the psychological health of the townspeople. The team conducted 350 interviews with mental health workers to collect opinions of victims' reactions. In addition, two surveys were administered to obtain the victims own feelings of psychological well-being, one six months after by personal interview and the other one year later by mail. Short- and long-term findings indicated an extremely low rate of severe mental illness, if any, as a consequence of the tornado, and that a large percentage had extremely positive reactions in terms of heightened sense of community and confidence in personal ability to handle crisis. 5 references.

86.
The Committee for the Compilation of Materials on Damage Caused by the Atomic bombs in Hiroshima and Nagasaki. HIROSHIMA AND NAGASAKI. New York: Basic Books, Inc., 1981.

On August 6, 1945 in Hiroshima and on August 9, 1945 in Nagasaki, atomic bombs were dropped for the first time in human history, obliterating hundreds of thousands of people along with their homes and places of work; many thousands more suffered serious physical and psychological injuries which are not healed yet; and the genetic damages may well last for several generations, if not indefinitely. This book is an account of the overall human effects of the atomic bombings which brings together all that is known about the short- and long-term effects of what may well be the most horrible event of the twentieth century. It represents both a summary and an analysis by Japan's leading physicists, physicians, and social scientists of the latest findings about the immediate damage of the bomb- the permanent medical, genetic, social and psychological effects. There is discussion of the breakdown of the community, loss of wealth, and psychological trends among victims. The authors look at the psychological shock of the atomic bombings; loss and recovery of psychological equilibrium; and the precariousness of the rebuilt lives of the victims due to threat to health, fear of deformed children, fear of economic instability if radiation decreased ability to work, fear of disintegration of families, and discrimination. Finally, the evolution of

the A-bomb victims' attitudes towards their experience are explored--both initial attitudes and convictions, and emerging convictions. 950 references.

87.
Titchener, James L.; Kapp, Frederic T.; and Winget, Carolyn. The Buffalo Creek Syndrome: symptoms and character change after a major disaster. In: Parad, Howard J.; Resnik, H.L.P.; and Parad, Libbie G., eds. EMERGENCY AND DISASTER MANAGEMENT: A MENTAL HEALTH SOURCEBOOK. Bowie, Maryland: The Charles Press Publishers, Inc., 1976, 283-294.

On February 26, 1972, a dam formed by the Buffalo Mining Company's "gob piles" gave way, unleashing over a million gallons of water and mud to rush down the Buffalo Creek Valley destroying everything in its path, killing 118 persons and leaving 4000 homeless. Six hundred and twenty five survivors instituted legal action against the Pittson Company, owner of the mining operation. An analysis of the disaster by a psychiatric team from both official accounts and stories of survivors, and findings from case reports are presented. An explanation of the persistence of symptoms and the appearance of actual change in character and lifestyle stemming from the disaster and still manifest in follow-up two years later is offered. These manifestations (isolation, impotent rage and dismay, unresolved grief, sense of meaninglessness, feeling of helplessness and entrenchment) were found in nearly all the survivors. 19 references.

88.
Tyhurst, J.S. Individual reactions to community disaster: the natural history of psychiatric phenomena. AMERICAN JOURNAL OF PSYCHIATRY, 107(10):764-769, 1951.

To the three already-defined types of observation of individual behavior in disaster (reactions, external factors, psychodynamics) a fourth is added: the natural history of the process, that is, the chronological phases into which such observations fall. Each phase of the disaster is examined (impact, recoil, and post-traumatic period) with respect to stresses involved, duration/time-perspective, and psychological phenomena. Delineation of natural history is an important first step in research method. This chronological perspective is analyzed through a list of questions concerning its usefulness in fieldwork. These questions will hopefully

lead to a concept for organizing data, predicting reactions, and experimenting with intervention activities. 21 references.

89.
Tyhurst, J.S. Psychological and social aspects of civilian disaster. CANADIAN MEDICAL ASSOCIATION JOURNAL, 76:385-393, 1957.

Social and psychological consequences of disaster and of the factors that influence the severity and persistence of unfavorable reactions are presented and discussed in detail. Measures for prevention and early treatment of psychiatric disabilities are suggested for physicians since they play the central role in the early management of psychological distress in disaster. Each of the three periods (impact, recoil and post-traumatic) are characterized according to stress, time duration and psychological phenomena. Some factors that seem important in determining the nature and severity of the reactions and the process of recovery are outlined (element of surprise, separation from family, outside help, leadership, communication, measures directed towards reorientation, methods of evacuation and reactions of children). 33 references.

90.
Wolfenstein, Martha. DISASTER. Glencoe, Illinois: The Free Press, 1957.

This book is the result of a study undertaken for the Committee on Disaster Studies of the National Academy of Sciences-National Research Council. Material collected from interviews with disaster victims by research teams. are the basis for formulating a series of hypotheses about how people react to disastrous events during three time phases--threat, impact, and aftermath. The threat phase deals with worries, denial, attitudes about precaution and efforts at propitiation of fate, ways in which past experience of catastrophe influences anticipations, and effects of sharing danger with others. The impact phase considers the illusion of centrality, feeling of abandonment, disaster syndrome, panic, egoism and altruism, the divergent tendencies toward emotional excitement of efficient action, and alternations between distressed and euphoric feelings in living through a catastrophe. The aftermath phase is concerned with tormenting memory, fear of recurrence, attraction of disaster locale for

sightseers, motives which impel victims to move back to the same area, victims' sentiment that property is payment for life, rise and fall of the postdisaster utopia, issues concerning whether men or gods are to blame, and the alternatives of revolt against the powers that be or submission to them in the face of catastrophe. 73 references.

APPENDIX C

SAMPLING METHODOLOGY

FOR

JACKSON DAMAGE SURVEY

AD-A145 125 HUMAN COSTS OF FLOODING THE 1979 'EASTER' FLOOD AT JACKSON MISSISSIPPI(U) ARMY ENGINEER INST FOR WATER RESOURCES FORT BELVOIR VA L G ANTLE ET AL. APR 84 2/2

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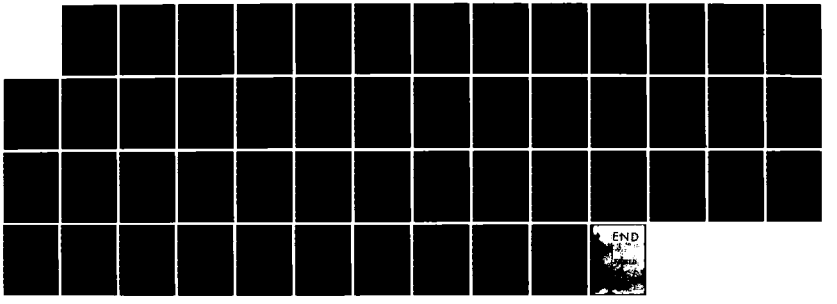
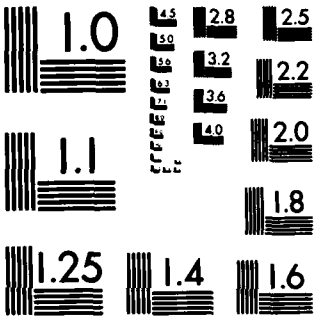




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

DATA SOURCES

The data needs for this research consist of both secondary and primary data. Secondary data consists of financial reports from the governments of the state of Mississippi, the city of Jackson, Mississippi, public and private owned utilities, churches and other agencies which provided assistance during and after the flood. Primary data are those data obtained from homeowners/dwellers of residential units, owners/managers of commercial firms and industrial organizations. The techniques for collecting the data are described separately under the headings of secondary data and primary data.

The next section describes the sampling procedures employed in the collection of data from the residential units selected for study. Before turning to the specifics of the samples, a general discussion of multistage stratified cluster quota sampling should clarify some of the inherent problems and complexities of such a design.

Multistage Stratified Cluster Quota Sampling

Multistage stratified cluster quota sampling is a combination of several techniques associated with probability sampling. As Babbie (1973) notes, multistage cluster sampling is based on repeated listing and sampling by the researcher. The multistage process involves sample selection from different, but related, levels or stages. By using clusters, the researcher is able to

select sample units from the target population in groups rather than individually. "Such a design typically involves the initial sampling of groups of elements-clusters followed by the selection of elements within each of the selected clusters," (Babbie, 1973:96). By stratifying the sample, a more representative sample may be achieved, thus decreasing the probably amount of sampling error. Stratification can be employed by arranging the elements of the population into strata or subsets. These subsets are homogenous within, while at the same time heterogeneity exits between them. From these subsets, the researcher draws an appropriate number of elements. Finally, quota sampling is a process of selecting units on a proportionate basis (Kish, 1965).

In order to use this type of sample design, it is necessary to first partition the population into clusters according to specified criteria and then stratify these clusters by city block or some other appropriate characteristic. Once the clusters have been identified, the sampling frame can be developed, and simple random sampling procedures may be applied to select the elements from the sample list.

There are certain advantages and disadvantages associated with using a multistage stratified cluster quota sampling design. Kish (1965) suggests that the advantages of such a design are: 1) it is more convenient and less costly than a simple random sample; 2) the clustering of units reduces the numbers of units on the sample list; 3) it allows for the stratification of units which permits selection from each strata; and 4) it allows simple random selection procedures to be applied to select sample units from within strata.

There are several potential problem areas which may be encountered when a

multistaged stratified cluster quota sample design is employed to select the units for study: 1) sample means and variances are biased estimates of the population mean and variance; 2) tests of statistical significance based on these estimates are misleading; and 3) a greater probability of increased sampling error exists.

Corrective measures for the first two problems have been suggested by Kish (1965). Specifically, he has shown that by using the ratio means and variance to estimate the population parameters minimized both concerns. In regard to the problem of sampling error, it is noted that the potential for such errors exists at each stage of the design. In addition, when sample elements are drawn from clusters, particularly homogeneous clusters, estimates of sampling error may be overly optimistic.

One of the ways in which sampling error may be reduced is in the absolute size of the samples. The magnitude of the sampling error in simple random sampling is correlated with the size of the samples. Generally, as the size of the samples increases, the magnitude of the sampling error decreases. Since it is expected that some degree of sampling error will be represented at each stage of the sampling process, a sufficiently large number of sample units should reduce the size of the sampling error. Further, the utilization of simple random selection techniques at one or more stages of the multistage design should enhance the reduction in sampling error.

Finally, a necessary aspect of any interpretation of statistical data is precaution. Accordingly, the analyses of the data will feature a conservative approach in the application of statistics to the data.

The following section describes in detail the sampling procedures to be employed in the selection of the samples of residential units.

Having determined the size of the samples, and the specification of quotas for each type of structure, attention is now directed toward the issue of clusters and representativeness of samples.

Stage One: Delineation of Cluster Areas

One of the concerns noted above is that the sample selection process must provide samples that are representative of the geographical, racial and socioeconomic areas of Jackson. To insure that the units selected for study are representative of these areas maps of the city of Jackson will be subdivided into clusters. The criteria to establish the boundaries for these areas are based on the ecological organization of the city. Assuming that urban ecological units are both geographically limited and socioculturally homogeneous, such units will be easily identified on maps of the urban area.

In identifying the areas of the city, attention was given to the use of natural areas and/or sectors as a method for delineating the ecological patterns of Jackson. Natural areas are usually definable by such physical features as hills, rivers, railroad tracks, streets and highways, and/or distinctive names that serve to delineate a community within a community. Generally, natural areas have a high degree of cultural and economic uniformity.

Figure 34 - Number of Sample Units in Population, Sampling Fraction and Quota Size.

Population Elements	Number	Sampling Fraction	Quota Size
Residential	2,050	.253	518
Commercial	500	. 50	254
Industrial	37	.100	37
TOTAL			800

The urban area of Jackson was subdivided as follows: Upper Northeast Jackson, West of Pearl River to the west boundary of the 1979 Easter Flood and north of Hanging Moss Creek: Lower Northeast Jackson, west of the Pearl River to the west boundary of the 1979 Easter Flood and north of Lakeland Drive; Fairground area, west of the Pearl River, south of commercial firms and industrial organizations from the urban areas of Jackson, Mississippi subjected to damage by the Easter Flood.

Sampling Selecting Procedures

As noted above the sample design for selecting the units of study for Easter Flood is complex. Specifically, the design must provide a method by which samples from residential units, commercial firms and business organizations can be selected, while at the same time be representative of the geographically distinct areas within the city of Jackson, Mississippi. Accordingly, the most appropriate design to achieve these goals in a

multistage stratified cluster quota sample in which the essential stratification is on the units to be studied (i.e., residential, commercial and industrial).

Given that the population is stratified by type of structure (i.e., residential, commercial and industrial), one sample was selected for residential units, and another one was selected for the commercial units. In Figure 34, the population for each type of unit, sampling fraction and quota size for those units selected for interview are shown.

Lakeland Drive, north of I-20 and west to the limits of the 1979 Easter Flood; Southwest Jackson, South Jackson, Byram and Flowood-Pearl and Richland, all east of the Pear River.

It should be noted that the subdivision of an urban area by the methods described above is not without problems and disadvantages. For example, natural areas tend to be large and difficult to clearly delimit within cities. Sectors are useful for delineating residential area but are problematical for identifying industrial zones. Census tracts present problems in that they are usually too numerous and are arbitrarily delineated.

In order to avoid the problems noted above, the research staff visually survey each cluster area to locate commercial and industrial units in each cluster. The identified commercial and industrial firms were checked on address range maps as to their location.

Once the cluster areas were delineated, infra-red aerial photographs of Jackson, which were taken about 30 minutes before the peak of the flood from an altitude of 12,000 feet, were used to identify the limits of the flood water in the urban area of Jackson. The infra-red photographs provided a method to ascertain the extent of flooding within each cluster area, and to identify those structures inundated.

Cluster area which received flooding were identified on address range maps of Jackson, and the number of residential units was determined for each cluster. A second visual inspection of these areas assisted the researchers in determining the appropriateness of the areas for identifying the structural units (residential, commercial, and industrial) subjected to flooding.

After identifying the flooded areas by streeta and address of the flooded residential units a sampling frame was constructed listing the 2,050 residential units by address. A 25 percent systematic random procedure yielded a sample of 518 residential units for study.

Similarly, the commercial firms were selected on a systematic random basis. The firms were identified according to their geographical location within the flood plain. Staff percsonnel were instructed to visually review the cluster areas, make field notes of the commercial organizations, and then, systematically select those firms that were representative of the clustered commercial organizations. Approximately 1,000 commercial organizations were identified of this number, 227 (22.7 percent) were selected for interview.

The industrial units were identified through several procedures: (1) information relative to the number of industries in the Jackson area was obtained by the Mississippi Research and Development Center, and from the Jackson, Mississippi Chamber of Commerce. The list provided by these two agencies permitted the identification of the industries on address range maps relative to the 1979 flood. In the basis of these techniques, 37 industries which were inundated were identified. Officers of the industrial units were contacted via telephone and an interview data was arranged. Completed interviews represent 100 percent of the flooded industries.

APPENDIX D

INTERVIEW FORM

AND

DATA CODEBOOK

FOR

JACKSON DAMAGE SURVEY

JACKSON, MISSISSIPPI FLOOD SURVEY
RESIDENTIAL SCHEDULE

INTERVIEWER:_____

SCHEDULE NO.:_____

DATE:_____ (TIME:_____)

NAME OF RESPONDENT_____

ADDRESS_____

_____

Zip_____

PHONE NO.:_____

1. WERE YOU LIVING AT THIS ADDRESS DURING THE TIME OF THE "EASTER FLOOD" IN APRIL, 1979?

_____ 1. Yes

_____ 2. No →

If no, stop interview—thank respondent and select an alternate replacement.

2. WAS YOUR HOUSE FLOODED DURING THE "EASTER FLOOD"?

_____ 1. Yes

_____ 2. No →

If no, stop interview—thank respondent and select an alternate replacement.

3. HOW LONG HAVE YOU LIVED AT THIS ADDRESS?

Number of years _____.

4. HOW OLD WOULD YOU SAY THIS HOUSE IS? THAT IS, HOW LONG HAS IT BEEN BUILT?

Number of years _____.

5. THIS RESIDENTIAL STRUCTURE IS:

_____ 1. Single family dwelling

_____ 2. Duplex

_____ 3. Rooming/boarding house

_____ 4. Apartment

_____ 5. Mobile home

_____ 6. Other (specify) _____.

6. OTHER STRUCTURES ON PROPERTY

A. Garage

0. none

1. attached

2. unattached

B. Shed

1. yes

2. no

C. Other structures (specify) _____

_____

7. ARE YOU RENTING OR DO YOU OWN THIS STRUCTURE?

_____ 1. renting

_____ 2. own outright

_____ 3. mortgaged

_____ 9. don't know/no response

NOTE: → If renting, skip to item no. 9

8. A. WHAT IS THE TOTAL MARKET VALUE OF THIS PROPERTY? (Including buildings and land)

$_____

B. WHAT IS THE MARKET VALUE OF THIS LAND (only)?

$_____

C. WHAT IS THE SQUARE FOOTAGE OF THE PRIMARY STRUCTURE? (excluding attached garages)

width X length = _____square feet.

9. WHAT IS THE VALUE OF THE CONTENTS OF THIS STRUCTURE AND ANY OTHER STRUCTURES ON THIS PROPERTY (exclude vehicles, trailers, etc.)

A. Contents of residence (exclude carpet, furnaces, built-in appliances, air cond.)

furnishings $_____

personal items $_____

recreation items $_____

Total $_____(source of estimate) _____

B. Contents of other structures on property (specify structure)

_____ $_____

_____ $_____

_____ $_____

_____ $_____

Total $_____ (source of estimate)_____

10. DURING THE FLOOD OF APRIL, 1979, DID YOU HAVE FLOOD WATERS ON YOUR LAND?

A. 1. Yes

2. No

3. Don't know/no response

(IF YES) WHAT PERCENT OF YOUR PROPERTY (LAND) WAS UNDER WATER?

B. 0. less than 25%

1. 25 to 49%

2. about 50%

3. 51 to 74%

4. 75 to 100%

C. (Interviewer is to request the specific information to fill out the chart on the following page. This material is very important to the study, so probe to achieve accuracy in determining dollar cost damage to both the structures and contents).

10c.

Type of Building[1]	1=yes 2=no If Structure Damaged	1=yes 2=no If Water Entered Bldg.	Valuation of Structural Damage (if respondent is renter, skip this column)[2]	Valuation of Damage to Contents of Bldg.[3]	Depth of water in each bldg. (Indicate + if above floor level of first floor and - if below first floor level)[4]
A (main bldg)			Amt. $ Specify	Amt. $ Specify	
B (Specify)			Amt. $ Specify	Amt. $ Specify	
C (Specify)			Amt. $ Specify	Amt. $ Specify	
D (Specify)			Amt. $ Specify	Amt. $ Specify	
E (Specify)			Amt. $ Specify	Amt. $ Specify	

+8'
+7'
+6'
+5'
+4'
+3'
+2'
+12"
+6"
0 (1st. floor level)
-1'
-2'
-3'
-4'
-5'
-6'

[1]Specify what each bldg. is--i.e., residence, detached garage, guest house, tool shed, etc.

[2]Determine $ damage to structure (which includes carpet, furnace, built-in appliances, air conditioners, etc.), and specify how figure was arrived at (such as repair/replacement costs, insurance collected, etc.).

[3]Determine $ damage to contents of all buildings or property (appliances, furniture, recreational equip., tools, personal items, clothes, and excluding vehicles, campers, etc. and specify how figure was arrived at--such as repair/replacement costs, insurance collected, etc.).

[4]Water depth in bldg. (indicate depth of water above or below first floor level = 0 for each bldg.).

10. D. WAS THERE DAMAGE TO YOUR LANDSCAPE OR GARDEN?

1. Yes
2. No
3. Don't know/no response

E. If yes, please specify:

erosion $_____

plants destroyed $_____

broken pipes $_____
(septic services)

11. WERE THERE OTHER DAMAGES THAN THOSE INCLUDED ABOVE?

Specify _____

_____

_____

12. A. IF YOUR PLACE OR RESIDENCE SUFFERED ANY FLOOD DAMAGE, WHAT WOULD YOU ESTIMATE TO BE YOUR TOTAL MAN HOURS OF LABOR INVOLVED IN "CLEAN-UP" (this doesn't include the hours of any persons you might have hired for the job such as painters, electricians, etc.)

Number of people _____

Total Man Hours _____

B. WHAT DO YOU ESTIMATE THE GENERAL CLEAN-UP COSTS TO HAVE BEEN IN ADDITION TO THE ABOVE ITEMIZED COSTS?

$_____

C. WAS THE "EASTER FLOOD" OF APRIL, 1979 THE FIRST TIME YOUR HOME HAD FLOODING AT THIS ADDRESS?

1. Yes
2. No
9. Don't know/no response

If no, when was the previous flooding? (Date) _____

D. AS A RESULT OF YOUR APRIL, 1979 FLOOD EXPERIENCE HAVE YOU CONSIDERED SELLING AND/OR MOVING TO A MORE FLOOD FREE AREA?

1. Have considered moving
2. Have not considered moving
3. Am planning to move
9. Don't know/no response

E. DO YOU THINK THAT THE MARKET VALUE OF YOUR PROPERTY HAS INCREASED, DECREASED OR REMAINED ABOUT THE SAME AS A RESULT OF THE FLOOD?

1. Value increased
2. Value decreased
3. Remained about the same
9. Don't know/no response

13. DID YOU HAVE FLOOD INSURANCE (specifically flood insurance) ON THE APRIL, 1979?

A. 1. Yes
2. No
3. No-are renting
9. Don't know/no response

B. If yes, specify coverage: Structure $_____

Contents $_____

14. WERE ANY OF YOUR VEHICLES INCLUDING CARS, TRUCKS, CAMPERS, TRAILERS, etc. DAMAGED DUE TO FLOODING?

1. Yes
2. No
3. Don't know/no response

If yes, please provide the following information:

Vehicle	Repair/replacement cost	Depth of Water in Vehicle
A		
B		
C		

A. DURING THE FLOOD DID YOU EXPERIENCE A DISRUPTION OF UTILITIES (water, electricity, etc.)?

1. Yes
2. No
9. Don't know/no response

A) If yes, how long were services interrupted? _____ hours

B) Did you experience any losses due to such interruption of services (such as frozen food thawing, etc.)?

1. Yes specify $_____
2. No
9. Don't know/no response

B. AS A RESULT OF THE FLOOD WAS YOUR PROPERTY INFESTED WITH ANIMALS SUCH AS SNAKES, INSECTS, RATS, ETC.?

1. Yes
2. No
9. Don't know/no response

If yes, what did it cost to solve the problem? $_____

15. COMPOSITION OF HOUSEHOLD AT THE TIME OF THE FLOOD

PERSONS	AGE
Husband	
Wife	
Children	
1.	
2.	
3.	
4.	
Others	
1.	
2.	

16. A. WERE YOU AND/OR OTHER MEMBERS OF THIS HOUSEHOLD EMPLOYED AT THE TIME OF THE "EASTER FLOOD"?

1. Husband employed: Yes _____ No _____
2. Wife employed: Yes _____ No _____
3. Others employed: Yes _____ No _____

16. B. If yes, did any of these employed miss work on the day of the flood and or days later? (exclude being "laid off")

1. Yes (specify reason) _____
2. No
9. Don't know/no response

16. C. If yes, and if not paid for missed time what were the total number of workers and lost wages for the household?

Number of workers _____ $_____

17. A. DID YOU (or any member of this household) LOSE YOUR JOB AS A RESULT OF THE FLOOD?

1. Yes
2. No
9. Don't know/no response

B. If yes, DO YOU (they) HAVE A NEW JOB?

1. Yes
2. No
9. Don't know/no response

18. DID YOU (or any member of this household) OBTAIN ANY EXTRA INCOME AS A RESULT OF THE FLOOD SUCH AS OVERTIME PAY OR ADDITIONAL PART OR FULL-TIME WORK?

1. Yes
2. No
9. Don't know/no response

If yes, what was the amount of the extra income? $_____

19. WERE YOU OR ANY MEMBER OF THE HOUSEHOLD TEMPORARILY LAID OFF FROM WORK AS A RESULT OF FLOOD DAMAGE AT THE PLACE OF EMPLOYMENT?

1. Yes
2. No
9. Don't know/no response

If yes, what were the total lost wages for the household?

$_____

20. AS A RESULT OF THE FLOOD WAS IT NECESSARY FOR YOU TO HIRE AN ATTORNEY?

1. Yes
2. No
9. Don't know/no response

If yes, what was the cost of services? $_____)

GIVE RESPONDENT CARD # 1

21. ON THIS CARD WE HAVE LISTED A VARIETY OF MEASURES TO REDUCE FLOOD DAMAGE. SINCE THE FLOOD OF EASTER 1979 HAVE YOU TAKEN OR DO YOU PLAN TO TAKE ANY OF THESE OR OTHER MEASURES TO PROTECT THIS PROPERTY AGAINST FLOODING?

Circle steps taken - A B C D E F G H I J K (Cost $_____)

Steps subject plans to take (letter _____) (anticipate cost $_____)

22. WHERE WERE YOU WHEN THE "EASTER FLOOD" OCCURRED?

1. Home
2. Work
3. Out of town
4. Other

A. From what source did you first learn about the flood?

(Specify) _____

B. DURING THE FLOOD WHAT WERE YOU MOST WORRIED ABOUT? (circle all mentioned and number in order mentioned)

1. damage to personal property and belongings
2. injury to self or other household members
3. damage to relatives' (not in household) property/belongings
4. injury to relatives (not in household)
5. damage to friends'/neighbors' property/belongings
6. injury to friends/neighbors
7. other (specify) _____
8. no particular worries
9. don't know/no response

C. DURING THE FLOOD HOW ANXIOUS, NERVOUS OR UPSET WERE YOU?

1. very anxious/upset
2. somewhat anxious/upset
3. not at all anxious/upset

23. AT ANY TIME DURING THE WHOLE FLOOD SITUATION DID YOU OR ANY OTHERS IN THE HOUSEHOLD CONSIDER EVACUATING YOUR RESIDENCE?

1. Yes
2. No
9. Don't know/no response

If no, don't know/no response, skip to item #36

24. AT THE TIME YOU WERE MAKING UP YOUR MIND WHETHER OR NOT TO EVACUATE DID YOU HAVE A PRETTY GOOD IDEA OF WHERE YOU MIGHT GO IF YOU DECIDED TO LEAVE?

1. no, no idea at all
2. no, not quite sure
3. yes, pretty sure
4. yes, definitely knew
5. not applicable
9. don't know/no response

25. DID YOU TALK IT OVER WITH ANYONE BEFORE DECIDING WHAT TO DO?

1. Yes
2. No
3. Not applicable
9. Don't know/no response

If no, no response/don't know, skip to item #29

26. DID YOU TALK EVACUATION OVER WITH RELATIVES NOT IN THE HOUSEHOLD?

1. Yes
2. No
3. Not applicable
9. Don't know/no response

27. DID YOU TALK IT OVER WITH NEIGHBORS?

1. Yes
2. No
3. Not applicable
9. Don't know/no response

(If yes) HOW IMPORTANT WAS THEIR ADVICE IN DECIDING WHETHER OR NOT TO EVACUATE?

1. not very important
2. somewhat important
3. very important
4. not applicable
9. don't know/no response

28. DID YOU CALL ANY LOCAL AUTHORITIES OR SERVICE AGENCIES TO ASK FOR ADVICE ABOUT EVACUATION?

1. Yes
2. No
3. Not applicable
9. Don't know/no response

29. IN MAKING YOUR DECISION, WHAT WORRIED YOU MOST ABOUT EVACUATING YOUR HOME?

1. leaving property behind
2. the cost of staying somewhere else
3. not knowing what will happen where you go
4. finding out that it was not necessary after all
5. not knowing where to go
6. other (specify_____)
9. don't know/no response

30. WERE YOU AFRAID THAT THERE MIGHT BE LOOTING IN YOUR NEIGHBORHOOD AFTER THE FLOODING IF YOU EVACUATED?

1. Yes
2. No
9. Don't know/no response

31. IN MAKING YOUR DECISION, WHAT WORRIED YOU MOST ABOUT STAYING AT YOUR RESIDENCE?

1. afraid of being killed or injured
2. afraid that you'd change your mind at the last moment and then couldn't get out
3. afraid that others would worry about you
4. might run out of food and supplies or utilities
5. other (specify_____)
9. don't know/no response

32. A. DID YOU EVACUATE YOUR HOME AT ANY TIME?

1. Yes
2. No
9. Don't know/no response

B. If yes, did any household members remain behind?

specify _____

If did not evacuate home, skip to item # 36

33. DID YOU LEAVE BEFORE OR AFTER WATER BEGAN COMING INTO YOUR HOME?

0. water never came into the home
1. before water came in
2. after water came in
9. don't know/no response

34. WHERE DID YOU GO AFTER EVACUATION?

1. relatives
2. neighbors
3. friends (not neighbors)
4. motel or hotel——cost/day (X) no. of days = $_____(total cost)
5. public shelter
6. other (specify_____)
9. don't know/no response

35. FOR HOW LONG WERE YOU OUT OF YOUR HOME?

1. for the day only
2. overnight
3. _____ days
9. don't know/no response

36. A. DURING OR AFTER THE FLOOD DID YOU SHELTER ANY PERSONS WHO LEFT THEIR HOMES BECAUSE OF THE FLOOD?

1. Yes
2. No
9. Don't know/no response

B. If yes, WHO DID YOU GIVE SHELTER TO? (indicate who and write in number of persons and number of days).

1. neighbors
2. relatives
3. friends
4. acquaintances
5. others (specify_____)

37. AT THE TIME OF OR IMMEDIATELY FOLLOWING THE FLOOD DID YOUR HOUSEHOLD UNDERGO ANY LOOTING?

1. Yes (specify_____ $_____)
2. No
9. Don't know/no response

38. A. WOULD YOU MIND HAVING YOUR HOME INSPECTED (evaluated in terms of damage) AT SOME FUTURE DATE BY PROFESSIONAL ENGINEERS?

1. inspection agreed to
2. refuses inspection
3. undecided

I WOULD LIKE TO ASK YOU SOME QUESTIONS OF A MORE PERSONAL NATURE REGARDING YOUR EXPERIENCES DURING AND FOLLOWING THE FLOOD. IF YOU FEEL THAT YOU DO NOT WANT TO ANSWER ANY OF THE FOLLOWING QUESTIONS, TELL ME AND WE CAN MOVE ON.

B. WHAT WAS THE MAJOR SOURCE OF NON-FINANCIAL ASSISTANCE TO THE PERSONS IN YOUR HOUSEHOLD DURING AND IMMEDIATELY AFTER THE FLOOD?

0. none
1. neighbors
2. relatives
3. friends outside of neighborhood
4. organizations (such as Red Cross, Salvation Army, etc.)
5. others (specify_____)
9. don't know/no response

39. DURING THE FLOOD WOULD YOU SAY THE MAJOR SOURCE OF HELP TO OTHER PERSONS CAME FROM. . .(READ LIST).

1. GOVERNMENT (police, civil defense, state agency, federal agency)
   or
2. COMMUNITY ORGANIZATIONS (such as Red Cross, Salvation Army, churches)
   or
3. NEIGHBORHOOD VOLUNTEERS
   or
4. FRIENDS FROM INSIDE THE NEIGHBORHOOD
   or
5. FRIENDS FROM OUTSIDE THE NEIGHBORHOOD
   or
6. RELATIVES
   or
9. don't know/no response

40. (give card number 2 to respondent)
ON THIS CARD IS A LIST OF ORGANIZATIONS WHICH PROVIDED HELP TO PEOPLE DURING AND FOLLOWING THE FLOOD. DID YOU OR ANY MEMBER OF THIS HOUSEHOLD CONTACT ANY OF THESE OR OTHER SIMILAR ORGANIZATIONS FOR ANY KIND OF ASSISTANCE FOLLOWING THE FLOOD? (Do not specify amount, if dollars).

No _____

(Circle) Organization	Aid Requested	Aid Received	If request rejected specify reasons
A			
B			
C			
D			
E			
F			
G			
H			

41. A. DO YOU OR DOES ANYONE IN THIS HOUSEHOLD HAVE RELATIVES LIVING IN JACKSON?

1. Yes
2. No
9. Don't know/no response

B. (IF YES) HOW CLOSE DO THEY LIVE TO YOU?

1. on the same block
2. 1/2 to 1 mile
3. 1 to 2 miles
4. more than 2 miles
9. don't know/no response
0. not applicable

42. DID YOU RECEIVE ANY HELP FROM RELATIVES THAT YOU BELIEVE YOU WOULD NOT HAVE RECEIVED FROM OTHERS?

1. Yes
2. No
3. Don't know/no response

43. HOW WOULD YOU DESCRIBE THE FEELINGS OF NEIGHBORLINESS IN THIS NEIGHBORHOOD BEFORE THE FLOOD?

1. weak feelings
2. average feelings
3. strong feelings
9. don't know/no response

44. WHAT ABOUT AFTER THE FLOOD? DO YOU FEEL NEIGHBORLINESS INCREASED, DECREASED, OR STAYED ABOUT THE SAME? (frequency of disagreements, arguments, getting together and visiting, borrowing, etc.)

1. increased neighborliness
2. decreased neighborliness
3. stayed about the same
9. don't know/no response

45. HOW WOULD YOU RANK THE "COMMUNITY SPIRIT" IN THIS NEIGHBORHOOD DURING THE FLOOD?

1. very strong
2. strong
3. average
4. weak
9. don't know/no response

46. HOW DOES THIS COMPARE WITH THE "COMMUNITY SPIRIT" BEFORE THE FLOOD?

1. greater
2. about the same
3. less
9. don't know/no response

47. HOW WOULD YOU SAY YOUR PHYSICAL HEALTH HAS BEEN SINCE THE FLOOD AS COMPARED TO BEFORE THAT TIME?

1. much worse
2. a little worse
3. about the same
4. a little better
5. much better
9. don't know/no response

48. DO YOU THINK OR DAYDREAM OR HAVE NIGHT DREAMS ABOUT THE FLOOD? (circle which)

1. no, not at all
2. sometimes
3. often
4. I did at first (used to) but not now
9. don't know/no response

49. DO YOU LISTEN MORE CLOSELY FOR WEATHER ADVISORIES NOW THAN BEFORE THE FLOOD?

1. Yes
2. No
3. At first, but not now
9. Don't know/no response

50. DO YOU FEEL MORE ANXIOUS, NERVOUS, OR UPSET WHEN IT LOOKS LIKE BAD WEATHER—THAN BEFORE THE FLOOD?

1. a lot more nervous
2. somewhat more nervous
3. a little more nervous
4. no
5. at first more nervous, but not now
9. don't know/no response

51. DO YOU WORRY MORE NOW ABOUT FAMILY MEMBERS WHO AREN'T HOME DURING BAD WEATHER THAN BEFORE THE FLOOD?

1. Yes
2. No
3. At first, but not now
9. Don't know/no response

52. DO YOU WORRY MORE NOW (THAN BEFORE THE FLOOD) ABOUT FLOODING—SPECIFICALLY WHEN IT RAINS HARD?

1. Yes
2. No
3. Did at first, but not now
9. Don't know/no response

53. DO YOU GET ANY KINDS OF PHYSICAL REACTIONS WHEN IT RAINS HARD OR BAD WEATHER THREATENS - THAT YOU DIDN'T GET BEFORE THE FLOOD?

1. Yes, often
2. Yes, sometimes
3. No
4. At first, but not now
9. Don't know/no response

54. <u>If yes</u>, please specify the nature of the physical reactions.

---

55. IN GENERAL, HOW HAVE YOU FELT EMOTIONALLY OR MENTALLY SINCE THE FLOOD AS COMPARED TO BEFORE? WOULD YOU SAY: (read out)

1. Much better
2. About the same
3. Not as good
4. Much worse
9. Don't know/no response

56. WHAT ABOUT OTHER MEMBERS OF THE HOUSEHOLD? DID ANY OF THEM HAVE ANY PHYSICAL KINDS OF REACTIONS AS A RESULT OF THE FLOOD?

1. Yes
2. No
9. Don't know/no response

relationship_____age_____

symptoms_____

_____

relationship_____age_____

symptoms_____

_____

57. A. HAVE YOU OR ANY MEMBERS OF YOUR FAMILY HAD TO SEEK PROFESSIONAL HELP FOR EMOTIONAL OR PHYSICAL PROBLEMS SINCE THE FLOOD WHICH YOU BELIEVE MIGHT BE RELATED TO YOUR FLOOD EXPERIENCE?

1. Yes(specify)

relationship_____age_____

type of help_____

_____

relationship_____

type of help_____

2. No

57. B. IF ANY MEMBERS OF THIS HOUSEHOLD HAD THESE KINDS OF PROBLEMS SPECIFICALLY SINCE THE EASTER, 1979 FLOOD, WHAT WOULD YOU ESTIMATE THE TOTAL OF SUCH RELATED MEDICAL COSTS TO BE?

$_____

Source of Estimate _____

58. A. WERE THE STREETS IN THIS NEIGHBORHOOD FLOODED?

1. Yes (specify estimated depth of water _____feet _____inches)
2. No
9. Don't know/no response

58. B. (If yes) DID TRAFFIC (including sightseers) CREATE PROBLEMS SUCH AS CONGESTION OR WAVE ACTION DUE TO MOVING VEHICLES? (circle which)

1. Yes
2. No
9. Don't know/no response

58. C. (If yes) WAS ANY ACTION TAKEN BY PEOPLE IN THE NEIGHBORHOOD TO RESTRICT OR STOP SUCH TRAFFIC?

1. Yes
2. No
9. Don't know/no response

If yes, specify what action taken _____

59. IN ORDER TO ASSESS INDIVIDUAL'S ABILITY TO ADJUST TO DISASTER LOSSES, WHAT WOULD YOU SAY YOUR INCOME FOR 1979 WAS?

Husband _____

Wife _____

Other _____

60. WHAT IS THE OCCUPATION OF THE MALE HEAD OF HOUSEHOLD (if retired write retired and then ask what he did prior to retirement and write this information in space provided)?

Specify_____

61. WHAT IS THE OCCUPATION OF THE FEMALE HEAD OF HOUSEHOLD (if retired write retired and ask what she did before retirement and write it in space provided)?

Specify_____

62. HIGHEST LEVEL OF EDUCATION COMPLETED BY MALE HEAD OF HOUSEHOLD (circle appropriate number)

1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA. JD. MD. PhD.
GRADE SCHOOL	HIGH SCHOOL	COLLEGE	PROFESSIONAL

63. HIGHEST LEVEL OF EDUCATION COMPLETED BY FEMALE HEAD OF HOUSEHOLD (circle appropriate number)

1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA. JD. MD. PhD.
GRADE SCHOOL	HIGH SCHOOL	COLLEGE	PROFESSIONAL

Give Card #3 to respondent

64. I WOULD LIKE YOU TO READ THESE NUMBERED STATEMENTS AND TELL ME HOW YOU FEEL ABOUT EACH STATEMENT - WHETHER YOU STRONGLY AGREE / AGREE / UNDECIDED / DISAGREE / STRONGLY DISAGREE.

	strongly agree	agree	undecided	disagree	strongly disagree
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

BACKGROUND INFORMATION (the following 4 items are not to be asked to the unless answers are not obvious to interviewer)

65. What is respondent's sex?

1. male
2. female

66. Race of respondent?

1. black
2. white
3. other (specify) _____

67. In terms of the racial makeup of this neighborhood, is it mostly

1. black
2. white
3. mixed black and white
9. don't know/no response

68. What is respondent's marital status?

1. never married
2. married
3. separated
4. divorced
5. widowed

If married, how long have you been married?

_____years

---

69. If resident is renting try to obtain from respondent the following information regarding the ownership of the property.

Name of landlord _____

Mailing address _____

_____

_____

_____

Zip Code

70. HAS THE FLOOD HAD AN EFFECT ON YOUR WAY OF LIFE IN ANY WAY - EITHER SHORT TERM OR LONG TERM EFFECTS?

1. Yes
2. No effect
9. Don't know/no response

If yes, please specify:

Short term effects	Long term effects
A)	A)
B)	B)
C)	C)

71. HOW LONG DID IT TAKE FOR THINGS (your routines, work, business, etc.) TO "GET BACK TO NORMAL" AFTER THE FLOOD?

1. hours (a day or less)
2. several days (a week or less)
3. several weeks (a month or less)
4. several months
5. still not back to normal
9. don't know/no response

72. WAS THE FLOODING OF YOUR PROPERTY THE RESULT OF SURFACE WATER ENTERING THE STRUCTURE OR DUE TO SEWERS BACKING UP?

1. surface water entering structure
2. sewers backing up
3. surface water and sewer backing up
4. other (specify) _____
5. no flooding in buildings

73. A. IS YOUR HOME WITHIN AN AREA PROTECTED BY SOME TYPE OF:

1. Flood warning system
2. Temporary evacuation plan
3. Other type of flood preparedness plan
4. No flood protection

73. B. If yes, please describe _____

_____

74. A. DID YOUR AVERAGE DAILY COMMUTE TIME (TO WORK) INCREASE AS A RESULT OF FLOODING?

1. Yes
2. No
3. Not applicable

74. B. If yes, how long? _____

75. WOULD YOU HAVE MOVED INTO THIS RESIDENCE IF YOU HAD KNOWN IT COULD BE FLOODED?

1. Yes
2. No

76. THAT JUST ABOUT COMPLETES THE INFORMATION WE NEED. CAN YOU THINK OF ANY ADDITIONAL EXPENSES THAT YOU (or any others in this household) HAD WHICH WERE RELATED TO THE FLOOD?

Example: child care costs, destroyed food items, and voluntary work for for friends, neighbors or community organizations.

Item	$ Cost or total hours

Card Number 1

a) Installed check valve in basement

b) Installed check valve between basement and street

c) Installed sump pump

d) Raised items off floor

e) Raised house

f) Flood prone area no longer used for storage or living space

g) Eliminated basement wall and floor cracks

h) Installed levee or flood control wall around property

i) Purchased flood insurance since April, 1979

j) Other (Please specify)_____

_____

k) No flood loss control measures taken

Card Number 2

Organizations

A. SMALL BUSINESS ADMINISTRATION

B. OFFICE OR UNEMPLOYMENT SECURITIES

C. SALVATION ARMY

D. AMERICAN RED CROSS

E. OFFICE OF EMERGENCY PREPAREDNESS, HOUSING ASSISTANCE

F. FAMILY SERVICES

G. OTHERS (specify)_____

Card Number 3

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

A. NOWADAYS A PERSON HAS TO LIVE PRETTY MUCH FOR TODAY AND LET TOMORROW TAKE CARE OF ITSELF.

B. MOST PEOPLE REALLY DON'T CARE WHAT HAPPENS TO THE NEXT FELLOW.

C. DISASTERS SUCH AS FLOODS ARE THE WORKS OF NATURE AND CANNOT BE PREVENTED.

D. WITH EVERYTHING SO UNCERTAIN THESE DAYS, IT ALMOST SEEMS THAT ANYTHING COULD HAPPEN.

E. IN SPITE OF WHAT PEOPLE SAY, THE LOT OF THE AVERAGE MAN IS GETTING WORSE NOT BETTER.

F. DISASTERS ARE GOD'S WAY OF PUNISHING PEOPLE FOR SINS WHICH THEY COMMITTED.

G. IT'S HARDLY FAIR TO BRING CHILDREN INTO THE WORLD WITH THE WAY THINGS LOOK FOR THE FUTURE.

H. THESE DAYS A PERSON DOESN'T KNOW WHOM HE CAN COUNT ON.

I. NEXT TO HEALTH, MONEY IS THE MOST IMPORTANT THING IN LIFE.

J. YOU SOMETIMES CAN'T HELP WONDERING WHETHER ANYTHING IS WORTHWHILE.

K. TO MAKE MONEY THERE ARE NO RIGHT AND WRONG WAYS ANYMORE, ONLY EASY AND HARD WAYS

L. DISASTERS ARE THINGS WHICH MEN MUST LEARN TO LIVE WITH AND DO THE BEST THEY CAN.

JACKSON MISSISSIPPI
FLOOD STUDY

CODEBOOK FOR RESIDENTIAL
SCHEDULES

RESIDENTIAL CODEBOOK
JACKSON FLOOD STUDY

Questionnaire Question No.	Variable Name	IBM CD. Col. No.	CODE
CARD 1			
Case ID No.	CASID	1-3	No. = ID No.
Card NO.	CARDNO	4-5	No. = Card No.
1	LIVEDRES	6	1 = yes, lived at address Easter 1979 2 = no, did not live at address Easter 1979 9 = missing data
2	HOUSFLOO	7	1 = yes, house flooded Easter 1979 2 = no, house not flooded 9 = missing data
3	LONGDRES	8-9	No. = actual years at address 99 = missing data
4	HOUSEOLD	10-11	No. = age of house 99 = missing data
5	RESIDENT	12-13	00 = none 01 = single family 02 = duplex 03 = rooming house 04 = apartment 05 = mobile home 06 = through 98, use for other specific if necessary 99 = missing data
6-A	GARAGE	14	0 = none 1 = attached 2 = unattached
6-B	SHED	15	1 = yes 2 = no 9 = missing data
6-C	OTHERBLDG	16	0 = none 1 = shed 2 = smoke house 3 = greenhouse 4 = auxillary living structure 5 = garage/utility storage 6 = wash house 7 = workshop 8 = outdoor toilet

Question NO.	Variable Name	IBM CD. Col. No.	CODE
Card 1			
7	RENTOWN	17	1 = renting 2 = own outright 3 = mortgaged 9 = don't know, no response, missing data
8-A	PROPVAL	18-24	0...0 = none No. = actual value of property 9...9 = missing data
8-B	LANVAL	25-31	Code same as above
8-C	SQFOOT	32-36	0...0 = none No. = actual sq. ft. 9...9 = missing data
9-A	VALFURN	37-43	0...0 = none No. = actual value furnishing 9...9 = missing data
$9\text{-}A_2$	VALPERTT	44-50	Same as above
$9\text{-}A_3$	VALRECTT	51-57	Same as above
$9\text{-}A_4$	TOTVAL	58-64	Same as above
$9\text{-}A_5$	ESTIBASE	65	0 = no estimate 1 = guess 2 = insurance 3 = itemized count 4 = SBA 5 = bills/tax 6 = repair cost 7 = replacement cost 8 = estimate 9 = missing data
$9\text{-}B_1$	CONTA	66	0 = no 1 = shed 2 = smoke house 3 = greenhouse 4 = auxillary living structure 5 = garage/utility storage 6 = wash house 7 = work shop 8 = outdoor toilet 9 = missing data
$9\text{-}B_2$	CONTB	67	Same as above
$9\text{-}B_3$	CONTC	68	Same as above
$9\text{-}B_{1a}$	VALCONTA	69-73	0...0 = none No. = actual value of contents 9...9 = missing data

Question NO.	VARIABLE NAME	COL. NO.	CODE
$9\text{-}B_{2a}$	VALCONTB	74-78	0...0 = none No. = actual value of contents 9...9 = missing data
GO TO NEW CARD #2			
CASE ID NO.	CASID	1-3	No. = ID No.
Card No.	CARDNO	4-5	No. = Card No.
$9\text{-}B_{3a}$	VALCONTC	6-10	Same as above
*(Note: If need additional space use columns 11-15. If not, skip 11-15).			
$9\text{-}B_{4}$	TVALCONT	16-20	Same as above
$9\text{-}B_{5}$	ESCONVAL	21	0 = no estimate 1 = guess 2 = insurance 3 = itemized count 4 = SBA 5 = bills 6 = repair cost 7 = replacement cost 8 = estimate 9 = missing data
10-A	LANFLOOD	22	1 = yes 2 = no 9 = missing data
10-B	LANUNWAT	23	0 = less than 25% 1 = 25% to 49% 2 = about 50% 3 = 51% to 74% 4 = 75% to 100% 9 = missing data
10-CA	TYPBLDGA	24	0 = no building 1 = major building 2 = shed 3 = green house 4 = smoke house 5 = auxillary living structure 6 = garage/utility 7 = washroom 8 = work shop 9 = missing data
10-CB	TYPBLDGB	25	Same as above
10-CC	TYPBLDGC	26	Same as above
10-CD	TYPBLDGD	27	Same as above

QUESTION NO. CARD 2	VARIABLE NAME	IBM CD. COL.NO.	CODE
10-CE	TYPBLDGE	28	Same as above
$10\text{-}CA_1$	DAMAGEA	29	0 = not applicable 1 = yes 2 = no 9 = missing data
$10\text{-}CB_1$	DAMAGEB	30	Same as above
$10\text{-}CC_1$	DAMAGEC	31	Same as above
$10\text{-}CD_1$	DAMAGED	32	Same as above
$10\text{-}CE_1$	DAMAGEE	33	Same as above
$10\text{-}CA_2$	WATENTA	34	Same as above
$10\text{-}CB_2$	WATENTB	35	Same as above
$10\text{-}CC_2$	WATENTC	36	Same as above
$10\text{-}CD_2$	WATENTD	37	Same as above
$10\text{-}CE_2$	WATENTE	38	Same as above
$10\text{-}CA_3$	VDAMBLGA	39-44	0...0 = none No. = $ value of structural damage to building 9...9 = missing data
$10\text{-}CB_3$	VDAMBLGB	45-50	Same as above
$10\text{-}CC_3$	VDAMBLGC	51-56	Same as above
$10\text{-}CD_3$	VDAMBLGD	57-62	Same as above
$10\text{-}CE_3$	VDAMBLGE	63-68	Same as above
$10\text{-}CA_{3a}$	ESTDAMA	69	0 = not applicable 1 = guess 2 = insurance 3 = itemized count 4 = loan 5 = bills/tax 6 = repair 7 = replacement costs 8 = estimate/appraises 9 = missing data
$10\text{-}CB_{3a}$	ESTDAMB	70	Same as above
$10\text{-}CC_{3a}$	ESTDAMC	71	Same as above
$10\text{-}CD_{3a}$	ESTDAMD	72	Same as above

Question No.	Variable Name	IBM CD. Col. No.	CODE
10-CA_4	DAMCONTA	74-79	0...0 = none No. = $ value of damage building contents
GO TO NEW CARD #3			
Case ID NO.	CASID	1-3	No. = ID No.
Card No.	CARDNO	4-5	No. = Card No.
10-CB_4	DAMCONTB	6-11	Same as above
10-CC_4	DAMCONTC	12-17	Same as above
10-CD_4	DAMCONTD	18-23	Same as above
10-CE_4	DAMCONTE	24-29	Same as above
10-CA_{4a}	DAMAEST	30	0 = not applicable 1 = guess 2 = insurance 3 = itemized count 4 = SBA 5 = Bill/Tax 6 = repair costs 7 = replace costs 8 = estimate/appraisal 9 = Missing Data
10-CB_{4a}	DAMBEST	31	Same as above
10-CC_{4a}	DAMCEST	32	Same as above
10-CD_{4a}	DAMDEST	33	Same as above
10-CE_{4a}	DAMEEST	34	Same as above
10-CA_5	WATLEVA	35-39	No. = Code inches
10-CB_5	WATLEVB	40-44	Same as above
10-CC_5	WATLEVC	45-49	Same as above
10-CD_5	WATLEVD	50-54	Same as above
10-C4	WATLEVE	55-59	
10-D	LANDAM	60	1 = yes 2 = no 3 = don't know/missing
10-E1	EROSDAM	61-65	0...0 = none No. = $ damage 9...9 = missing data
10-E2	PLANTDAM	66-70	Same as above

Question No.	Variable Name	IBM CD. Col. No.	CODE
$10\text{-}E_3$	PIPEDAM	71-75	Same as above
11	OTHDAM	76-80	0...0 = none No. = $ damage
GO TO NEW CARD #4			
Case ID No.	CASID	1-3	
Card No.	CARDNO	4-5	
$12\text{-}A_1$	NOPEOPLE	6-8	No. = Number of people 9...9 = missing data
$12\text{-}A_2$	MANHRS	9-12	No. = number of hours 9...9 = missing data
12-B	CLEANCOS	13-17	0...0 = none No. = cost of clean-up 9...9 = missing data
12-C	FIRSTFLO	18	1 = yes 2 = no 9 = don't know/missing data
$12\text{-}C_1$	PREFLO	19-22	Col. 19-20 = month first flood occurred; 21-22 = year flood occurred e.g., 0869 = Sept., 1969 9...9 = missing data
12-D	SELLMOVE	23	1 = have considered 2 = have not considered 3 = am planning to move 9 = missing data
12-E	MKTVALUE	24	1 = value increased 2 = value decreased 3 = remained same 9 = missing data
13-A	FCOOPINS	25	1 = yes 2 = no 3 = no-- are renting
$13\text{-}B_1$	AMTINBLD	26-31	0...0 = none No. = amount coverage 9...9 = missing data
$13\text{-}B_2$	AMTINCON	32-37	Same as above
14	VEHICLES	38	1 = yes 2 = no 9 = missing data

Question No.	Variable Name	IBM CR. Col. No.	CODE
$14\text{-}A_1$	VEHICLEA	39	0 = no vehicle 1 = car 2 = truck 3 = recreational vehicle 4 = motorcycle 9 = missing data
$14\text{-}B_1$	VEHICLEB	40	Same as above
$14\text{-}C_1$	VEHICLEC	41	Same as above
$14\text{-}A_2$	REPAIRVA	42-46	0...0 = none No. = repair/replacement cost for vehicle 9...9 = missing data
$14\text{-}B_2$	REPAIRVB	47-51	Same as above
$14\text{-}C_2$	REPAIRVC	52-56	Same as above
$14\text{-}A_3$	WATDEPVA	57-58	Code in inches 00 = 0 inches, etc.
$14\text{-}B_3$	WATDEPVB	59-60	Same as above
$14\text{-}C_3$	WATDEPVC	61-62	Same as above
14-A	UTIC	63	1 = yes 2 = no 9 = missing data
$14\text{-}A_A$	LONGUOUT	64-66	Code in hours 001 = 1 hour, etc.
$14\text{-}A_B$	LOSSES	67	0 = NA 1 = yes 2 = no 9 = missing data
$14\text{-}A_{B2}$	AMTLOSS	68-72	0...0 = none No. = $ amount lost to utility failure
14-B	INFESTED	73	1 = yes 2 = no 9 = missing data
$14\text{-}B_A$	EXTERM	74-78	0...0 = no No. = cost to exterminate 9...9 = missing data

Question No.	Variable Name	IBM CD. Col. No.	CODE
GO TO NEW CARD #5			
Case ID	CASID	1-3	
Card No.	CARDNO	4-5	
15-a	COMPA	6	0 = none 1 = husband 2 = wife 3 = child 4 = other 9 = missing data
15-b	COMPB	7	same as above
15-c	COMPC	8	same as above
15-d	COMPD	9	same as above
15-e	COMPE	10	same as above
15-f	COMPF	11	same as above
15-g	COMPG	12	same as above
15-h	COMPH	13	same as above
$15\text{-}a_2$	AGEPERA	14-15	00 = not applicable No. = actual age 99 = missing data
$15\text{-}b_2$	AGEPERB	16-17	same as above
$15\text{-}c_2$	AGEPERC	18-19	same as above
$15\text{-}d_2$	AGEPERD	20-21	same as above
$15\text{-}e_2$	AGEPERE	22-23	same as above
$15\text{-}f_2$	AGEPERF	24-25	same as above
$15\text{-}g_2$	AGEPERG	26-27	same as above
$15\text{-}h_2$	AGEPERH	28-29	same as above
15-B	TOTCOMP	30-31	No. = total number in household 99 = missing data
16-A	HUSBEMP	32	1 = yes 2 = no 9 = missing data

Question No.	Variable Name	IBM CD. Col. No.	CODE
$16\text{-}A_2$	WIFEEMP	33	Same as above
$16\text{-}A_3$	OTHEMP	34	Same as above
16-B	MISSWORK	35	Same as above
$16\text{-}B_1$	REASONS	36-37	00 = NA 01 = clean up property 02 = work closed due to flooded streets 03 = neighborhood street flooded 04 = car would not start 05 = illness due to flood 06 = work place flooded 99 = MD
$16\text{-}C_1$	NUMBWORK	38-39	No. = number of workers 99 = MD 00 = not applicable
$16\text{-}C_2$	WAGELOST	40-43	0...0 = not applicable Na = amount wages loss 9...9 = MD
17-A	LOSEJOB	44	1 = yes 2 = no 9 = MD
17-B	NEWJOB	45	0 = NA 1 = yes 2 = no 3 = MD
18	XINCOME	46	1 = yes 2 = no 3 = MD
18-C	TOTXINC	47-51	0...0 = NA No. = Total Extra income 9...9 = MD
19	LAIDOFF	52	1 = yes 2 = no 9 = MD
19_a	TEMPLOST	53-57	0...0 = none No. = total lost wages 9...9 = MD
20_1	ATTORNEY	58	1 = yes 2 = no 9 = MD

Question No.	Variable Name	IBM CD. Col. No.	Other
20_a	LAWCOST	59-62	0...0 = none No. = amount of attorney cost 9...9 = MD
Card # 5			
$21-_a$	PREVENT	63-73	Beginning in Col. 63, if respondent circled A, put a 1 in that col.; if he/she did not circle the letter put a 2. Continue procedure through col. 73 for each letter B,...K.
$21-_{a2}$	COSTPREV	74-78	0..0 = none No. = cost of preventive measure 9..9 = MD
Go to new card # 6			
Card ID	CASID	1-3	
Card No.	CARDNO	4-5	
$21-b_1$	PLANPREV	6-16	Code same as $21-a_1$
$21-b_2$	PROJCOST	17-21	Code same as $21-a_2$
22	WHERERES	22	1 = Home 2 = Work 3 = Out of town 4 = Other 9 = MD
22-A	SOURCINF	23	0 = none 1 = neighbor/friend 2 = radio 3 = television 4 = police 5 = family member 6 = saw water 7 = stepped in 8 = other 9 = MD
$22-B_1$	WORRYA	24	1 = worried about damage to personal property 2 = none
$22-B_2$	WORRYB	25	1 = worried about injury toself 2 = none

Question No.	Variable Name	IBM CD. Col. No.	CODE
$22\text{-}B_3$	WORRYC	26	1 = worried about damage to relatives property 2 = none
$22\text{-}B_4$	WORRYD	27	1 = worried about injury to relatives 2 = none
$22\text{-}B_5$	WORRYE	28	1 = worried about damage to friends'/neighborhood property 2 = none
$22\text{-}B_6$	WORRYF	29	1 = worried about injury friends/neighbors 2 = none
$22\text{-}B_7$	OTHERWOR	30	1 = getting to work 2 = no place to go 3 = snakes 4 = water getting in house 5 = unable to get out 6 = none
22-C	ANXIOUS	31	1 = very anxious/upset 2 = somewhat anxious/upset 3 = not at all anxious/upset
23	CONEVAC	32	1 = yes 2 = no 9 = MD
24	NOWHERGC	33	1 = no, no idea at all 2 = no, not quite sure 3 = yes, pretty sure 4 = yes, definitely knew 5 = NA 9 = MD
25	TALKONE	34	1 = yes 2 = no 3 = NA 9 = MD
26	TALKRELS	35	Same as above
27	TALKNEGH	36	Same as above
27-A	IMPORT	37	1 = not very important 2 = somewhat important 3 = very important 4 = NA 9 = MD

Question No.	Variable Name	IBM CD. Col. No.	CODE
28	CALLAUTH	38	1 = yes 2 = no 3 = NA 9 = MD
29	WORMOST	39	1 = leaving property b[illegible] 2 = cost of staying somewher else 3 = not knowing what will a where you go 4 = finding out not nec[illegible] after all 5 = not knowing where to go 6 = not knowing how to get out 7 = personal safety 9 = MD
33	FEARLOOT	40	1 = yes 2 = no 3 = MD
31	FEARSTAY	41	1 = afraid of being kille injured 2 = afraid changed mind and couldn't get out 3 = afaid others would worry about you 4 = might run out of food and supplies and utilities 5 = water too high 6 = vandalism 7 = seeing condition of house 8 = smokes, rodents 9 = MD
32-A	DIDEVAC	42	1 = yes 2 = no 3 = MD
32-B	MEMSTAY	43	0 = none 1 = husband 2 = wife 3 = husband and wife 4 = other 5 = other 9 = MD
33	LEAVE	44	0 = water never came int[illegible] 1 = before water came in 2 = after water came in 9 = MD

Question No.	Variable Name	IBM.CD Col. No.	CODE
34	GOAFTER	45	1 = relatives 2 = neighbors 3 = friends (not neig 4 = motel/hotel 5 = public shelter 6 = motor home 7 = other 9 = MD
35	LONGGONE	46	1 = for day only 2 = overnight 3 = week 4 = several weeks 5 = more than several 9 = MD
36-A	SHELTER	47	1 = yes 2 = no 9 = MD
36-B	WHOSHELT	48	1 = neighbors 2 = relatives 3 = friends 4 = acquiantances 5 = other
37	LOOTING	49	1 = yes 2 = no 9 = MD
37-A	KINDLOU	50-52	000 = none No. = actual amount 999 = MD
38-A	HOMINSP	53	1 = yes 2 = no 3 = undecided 9 = MD
38-B	FINASST	54-55	00 = none 01 = neighbors 02 = relatives 03 = friends outsi 04 = organizations etc.) 05 = other 09 = MD
39	HELPCAME	56	1 = government 2 = organization 3 = neighborhood volu 4 = neighborhood fri 5 = friends outsi 6 = relatives 9 = MD

Question No.	Variable Name	IBM CD. Col. No.	CODE
40-A	AIDREQA	57	0 = No aid requested 1 = aid requested
40-B_1	AIDREQB	58	Same as above
40-C_1	AIDREQC	59	Same as above
40-D_1	AIDREQD	60	Same as above
40-E_1	AIDREQE	61	Same as above
40-F_1	AIDREQF	62	Same as above
40-G_1	AIDREQG	63	Same as above
40-H_1	AIDREQH	64	Same as above
40-A_2	AIDRECA	65	Same as above
40-B_2	AIDRECB	66	Same as above
40-C_2	AIDRECC	67	Same as above
40-D_2	AIDRECD	68	Same as above
40-E_2	AIDRECE	69	Same as above
40-F_2	AIDRECF	70	Same as above
40-G_2	AIDRECG	71	Same as above
40-H_2	AIDRECH	72	Same as above
40-A_3	REASREJA	73	0 = NA 1 = too late 2 = not eligible 3 = noone available to help 4 = already received SBA loan 5 = self deselected 9 = MD
40-B_3	REASREJB	74	Same as above
40-C_3	REASREJC	75	Same as above
40-D_3	REASREJD	76	Same as above
40-E_3	REASREJE	77	Same as above
40-F_3	REAREJF	78	Same as above
40-G_3	REAREJG	79	Same as above
40-H_3	REAREJH	80	Same as above

Question No.	Variable Name	IBM CD. Col. No.	CODE
Go to new card # 7			
Case ID No.	CASID	1-3	
Card No.	CARDNO	4-5	
41-A	RELATIVE	6	1 = yes 2 = no 9 = Don't know (MD)
41-B	CLOSELIV	7	0 = NA 1 = same block 2 = 1/2 to 1 mile 3 = 1 to 2 miles 4 = more than 2 miles 9 = MD
42	RELHELP	8	1 = yes 2 = no 3 = don't know (MD)
43	FEELINGS	9	1 = weak feelings 2 = average feelings 3 = strong feelings 9 = don't know (MD)
44	SPIRIT	10	1 = increased neighborliness 2 = decreased neighborliness 3 = stayed about same 9 = don't know (MD)
45	COMSPRIT	11	1 = very strong 2 = strong 3 = average 4 = weak 9 = don't know (MD)
46	SPIRBEF	12	1 = greater 2 = about the same 3 = less 9 = don't know (MD)
47	HLTHAFT	13	1 = much worse 2 = a little worse 3 = about the same 4 = a little better 5 = much better 9 don't know (MD)
48	DAYDREAM	14	1 = no not at all 2 = sometimes 3 = often 4 = used to, but not now 9 = don't know (MD)

Question No.	Variable Name	IBM CD. Col. No.	CODE
49	WEATHER	15	1 = yes 2 = no 3 = at first, but not now 9 = don'know (MD)
50	BADWEATH	16	1 = lot more nervous 2 = somewhat mor nervous 3 = little more nervous 4 = no 5 = at first, but not now 9 = don't know (MD)
51	CONCERN	17	1 = yes 2 = no 3 = at first, but not now 9 = don'know (MD)
52	WORRYNOW	18	Same as above
53	PHYREACT	19	1 = yes, often 2 = yes, sometimes 3 = no 4 = at first, but not now 9 = don't know (MD)
54-A	KINDRECA	20	0 = none 1 = nervousness/trembly 2 = insommia 3 = anxiety/fear/worry 4 = stomach disorders 5 = high blood pressure 6 = headaches 7 = sweating 8 = increased heart heat/ pains 9 = don't know (MD)
54-B	KINDRECB	21	Same as above
55	FEELMENT	22	1 = much better 2 = about same 3 = not as good 4 = much worse 9 = don't know (MD)
56	FAMMEMS	23	1 = yes 2 = no 9 = don't know (MD)

Question No.	Variable Name	IBM CD. Col. No.	CODE
56-A	RELATA	24	0 = NA 1 = spouse/husband 2 = spouse/wife 3 = children/grandch 4 = parents/grandpa 5 = aunts/uncles 6 = brother/sister 7 = niece/nephew 8 = cousin 9 = MD
56-B	RELATB	25	Same as above
$56\text{-}A_1$	AGERELA	26-27	00 = NA No. = Age relative 99 = MD
$56\text{-}B_1$	AGERELB	28-29	Same as above
$56\text{-}A_2$	SYMRELA	30	Same code as 54-A
$56\text{-}A_3$	SYMRELAA	31	Same code as 54-A
$56\text{-}B_2$	SYMRELB	32	Same code as 54-A
$56\text{-}B_3$	SYMRELBB	33	Same code as 54-A
57-A	PROHELP	34	1 = yes 2 = no 9 = MD
$57\text{-}A_1$	MEMBERA	35	Code same as 56-A
$57\text{-}A_2$	AGEMEMA	36-37	00 = NA No. = age of famil A 99 = MD
$57\text{-}A_3$	TYPHELPA	38	0 = none 1 = hospitalized 2 = doctor 3 = medication 4 = other 9 = MD
$57\text{-}A_4$	TYPSYMPA	39	0 = none 1 = infection 2 = back injury 3 = nervousness 4 = anxiety/fe 5 = burns 6 = depression 7 = heart &/ bl 8 = cold/flu/a

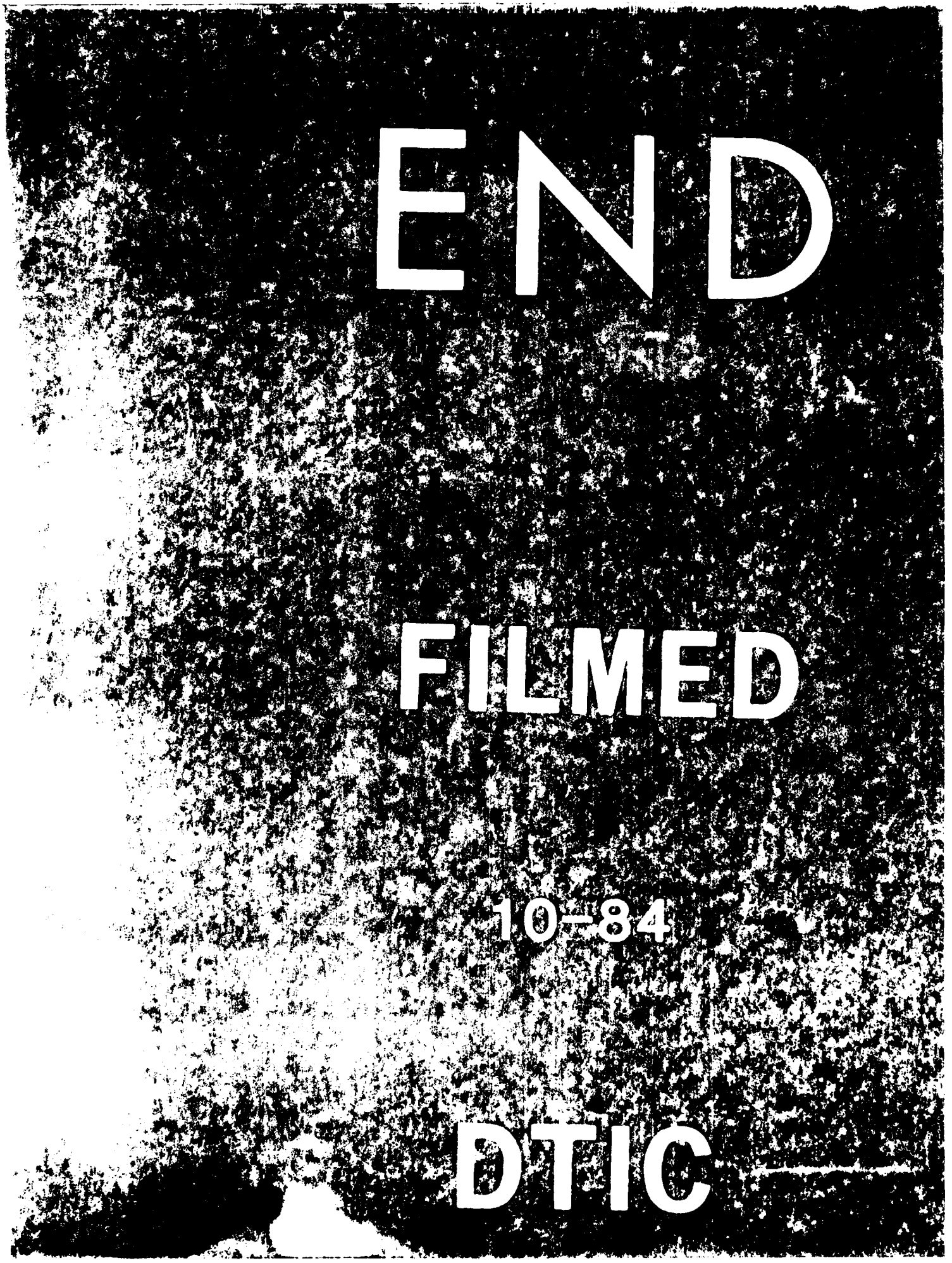
Question No.	Variable Name	IBM CD. Col. No.	CODE
57-A_5	MEMBERB	40	Code same as 56-
57-A_6	AGEMEMB	41-42	Code same as 57-/
57-A_7	TYPHELPB	43	Code same as 57-:
57-A_8	TYPSYMPB	44	Code same as 57-/
57-B	MEDICOST	45-49	0...0 = none No. = cost for medical area 9...9 = MD
57-B_1	MEDEST	50	0 = NA 1 = guess 2 = doctor bill 3 = prescription cost 9 = MD
58-A	STFLOOD	51	1 = yes 2 = no 9 = don't know
58-A_1	HOWDEEP	52-55	Code in inches. eg. 1 ft. = 0023 5 ft 6 in 0066 0000 = N.A. 9999 = MD
58-B	TRAFPROB	56	1 = yes 2 = no 9 = don't know (M
58-C	TOOKACT	57	1 = yes 2 = no 9 = don't know (M
58-C_1	ACTAKE	58-59	00 = no action taken 01 = called police 02 = police barricade 03 = blocked w/vehicles 04 = signs posted by police 05 = detoured traffic verbal 06 = stopped traffic with firearms 99 = MD
59-A	HUSINC	60	0 = (A) none 1 = (B) 1,000-4,000 2 = (C) 4,001-8,000 3 = (D) 8,001-12,000 4 = (E) 12,001-16,000 5 = (F) 16,001-20,000 6 = (G) 20,001-24,000 7 = (H) 24,001-28,000 8 = (I) 28,001 or more 9 = MD/no response

Question No.	Variable Name	IBM CD. Col. No.	CODE
59-B	WIFEINC	61	Same as above
59-C	OTHINC	62	Same as above
60	MALOCCUP	63	Use Hollinghead 2 factor ind to code occupation
61	FEMOCCUP	64	Same as above
62	EDMACE	65-66	00 = none 01-12 = 1 through 12 13 = 1 year college 14 = 2 yrs college 15 = 3 yrs college 16 = 4 yrs college 17 = 1 yr Masters work 18 = Masters degree 19 = JD (Lawyer) 20 = MD,ED,PhD,DBA,etc.
63	EDFEMALE	67-68	Same as above
64-1	ATITUDEA	69	0 = MD 1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree
64-2	ATITUDEB	70	Same as above
64-3	ATITUDEC	71	Same as above
64-4	ATITUDED	72	Same as above
64-5	ATITUDEE	73	Same as above
64-6	ATITUDEF	74	Same as above
64-7	ATOTIDEG	75	Sa,e as above
64-8	ATITUDEH	76	Same as above
64-9	ATITUDEI	77	Same as above
64-10	ATITUDEJ	78	Same as above
64-11	ATITUDEK	79	Same as above
64-12	ATITUDEL	80	Same as above
Go to new card # 8			
Case ID No.	CASID	1-3	

Question No.	Variable Name	IBM.CD. Col. No.	CODE
Card No.	CARDNO	4-5	
65	SEXRESP	6	1 = male 2 = female
66	RACERESP	7	1 = black 2 = white 3 = amer. Indian 4 = Mexican/American 5 = oriental 6 = other 9 = MD
67	NEIGRACE	8	1 = black 2 = white 3 = mixed 9 = don't know (MD)
68	MARSTAT	9	1 = never amrried 2 = married 3 = seperated 4 = divorced 5 = widowed 9 = don't know (MD)
68-A	LONGMAR	10-11	No. = actual yrs 00 = NA 99 = MD
70	WAYLIFE	12	1 = yes 2 = no 9 = MD
$70\text{-}A_1B_1C_1$	SHORTIMA	13-14	00 = none 01 = financial costs 02 = cleaning/repair/replace 03 = routine disruption 04 = nervousness 05 = anxiety/fear/worry 06 = anger 07 = insomnia 08 = feeling of security 09 = problems with memory 10 = more prepared 11 = other 99 = MD
$70\text{-}A_1B_1C_1$	SHORTIMB	15-16	Same as above
$70\text{-}A_1B_1C_1$	SHORTIMC	17-18	Same as above

Question No.	Variable Name	IBM CD. Col. No.	CODE
70-$A_2B_2C_2$	LONGTERA	19-20	Same as above
70-$A_2B_2C_2$	LONGTERB	21-22	Same as above
70-$A_2B_2C_2$	LONGTERC	23-24	Same as above
71	RETNORM	25	1 = less than a day 2 = several days 3 = several weeks 4 = several months 5 = still not back to [illegible] 9 = MD
72	CAUSFLOD	26-27	00 = no flooding 01 = surface water 02 = sewers backing up 03 = surface water and [illegible] 99 = MD
73-A	PROTECT	28	1 = flood warning syste[illegible] 2 = temporary evacuation 3 = other 4 = no protection
73-B	TYPPLAN	29	0 = NA 1 = levee 2 = alert horns 3 = volunteer 4 = other
74-A	COMMUTE	30	1 = yes 2 = no 3 = NA
74-B	COMLONG	31-33	Code in minutes: /32 = 2 [illegible] and 12 minutes.
75	MOVEDIN	34	1 = yes 2 = no 9 = MD
76	EXPENSA	35-36	00 = none 01 = food and hospital [illegible] 02 = clean-up cost 03 = transportation 04 = utility costs 05 = important papers 06 = clothing/fabric/sh[illegible] 07 = medical expenses 08 = paint/cleaning ite[illegible] 09 = firearms 10 = bathroom fixtures 11 = photo equipment 12 = records/types/pho[illegible] 13 = repair/replacement of [illegible]
76	EXPENSB	37-38	
76	EXPENSC	39-40	

Question	Variable Name	IBM CD. Col. No.	CODE
			14 = medical expenses 15 = other 99 = MD
76-A	ADDCOSTS	41-46	0...0 = none No. = additional costs 9...9 = MD
77	TIMESFCO	47-48	No. = no. of times flooded 99 - MD
78	MORTGAGE	49	1 = yes 2 = no
78-a	ADDMORTS	50-51	code number of additional mortgages e.g. 01 = one additional mortgage 00 = none; 99 = MD
78-c	ADDYRS	56-59	0..0 = none No. = additional years. to pay on mortg 9..9 = MD
78-b	INCRPAY	52-55	0..0 = none No. = 1 increase to monthly payment 9..9 = MD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