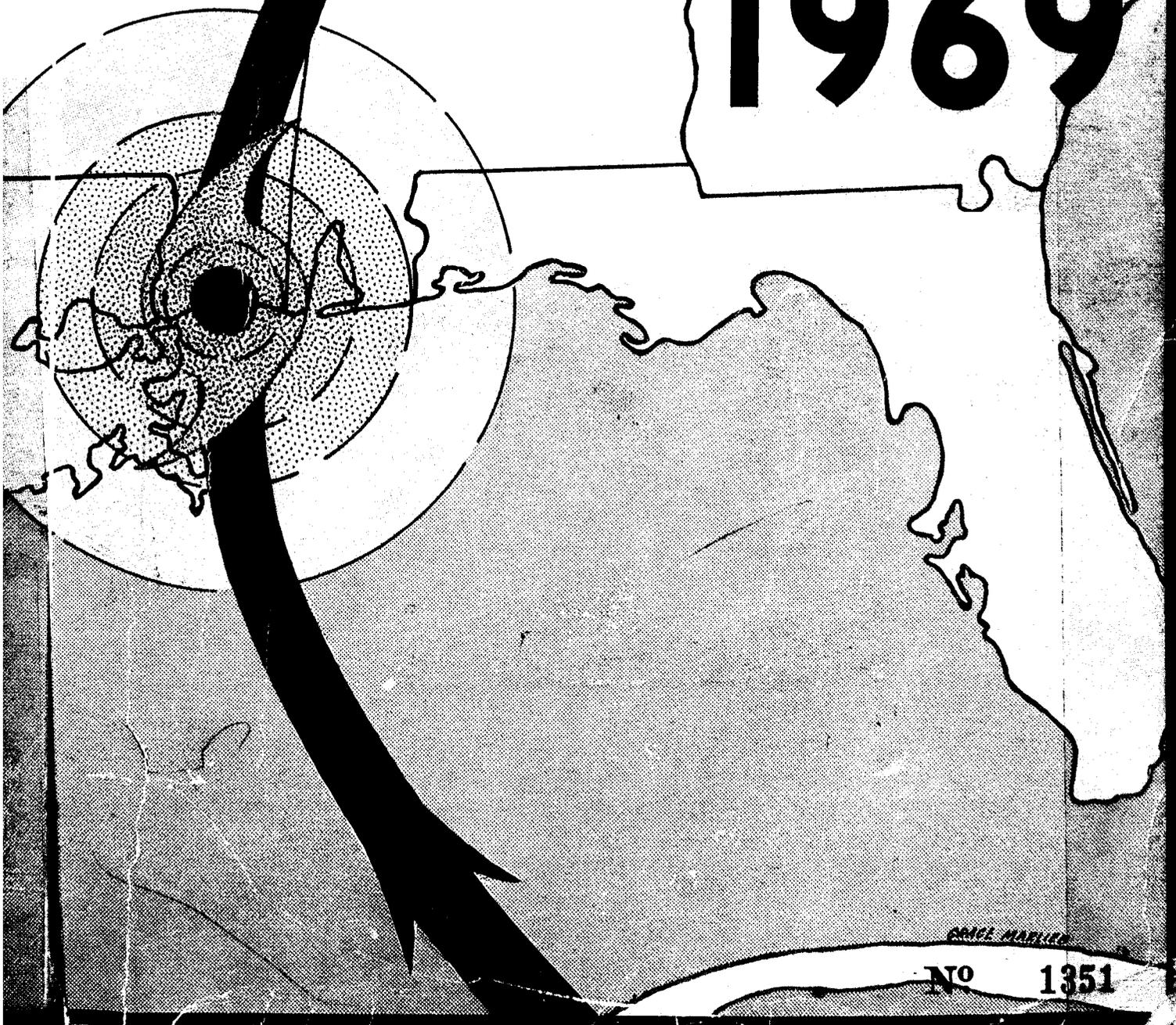


CAMILLE

1969



GEORGE HARRISON

NO 1351

REPORT ON HURRICANE CAMILLE

14-22 AUGUST 1969

DISCARD

945.2
CB
R47
1970

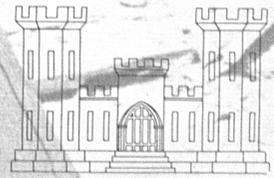
ATMOSPHERIC SCIENCES
LIBRARY
DEC 23 1971
N.O.A.A.
U.S. Dept. of Commerce

LIBRARY
JUN 09 2003
National Oceanic &
Atmospheric Administration
U.S. Dept. of Commerce

Prepared by the
U.S. ARMY CORPS OF ENGINEERS

New Orleans, Louisiana
May 1970

71-2578



National Oceanic and Atmospheric Administration Weather Bureau Hurricane Series

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages
Faded or light ink
Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or Library.Reference@noaa.gov.

HOV Services
Imaging Contractor
12200 Kiln Court
Beltsville, MD 20704-1387
November 6, 2007

**INSIDE COVER PHOTO
BY JACK THORNELL
AP WIREPHOTO**

FOREWORD

On Sunday, August 17, 1969, one of the most intense hurricanes ever recorded sideswiped the deep delta country of Louisiana and slammed into the Mississippi Gulf Coast, leaving in its wake a montage of devastation. Scourged by wind and water, and deprived of many of its familiar landmarks, the area within Camille's swath took on the appearance of an alien land. Buildings collapsed in place, or were transported, intact or otherwise, to locations remote from their own foundations. Watercraft—even oceangoing ships—were lifted by the hurricane's surge, and left perched by its recession on dry land.

Camille's top winds were estimated at an astounding 201.5 miles per hour, and the barometric pressure in her calm eye dropped as low as 26.61 inches of mercury, second lowest of all recorded hurricanes. The hurricane surge at Pass Christian, Mississippi, was recorded at 22.6 feet above the normal level of the Gulf, and fragmentary evidence indicates that it may have risen even higher.

As Camille moved inland, torrential rains swamped the areas along her track through Mississippi, Tennessee, Kentucky, West Virginia, and Virginia. In a final, almost capricious blow, Camille dumped up to 27 inches of rain on Virginia, causing flash floods and triggering massive landslides.

The total dollar damage in the eight affected states has been estimated at some \$1.0 billion. But Camille left behind an even more somber legacy: 262 persons are known to have died at her hands, a total that may be higher since some are still missing and unaccounted for.

CONTENTS

	Page
FOREWORD	iii

SECTION I AUTHORITY, PURPOSE, AND SCOPE

AUTHORITY	3
PURPOSE	3
SCOPE	3

SECTION II THE HURRICANE--CHRONOLOGY AND COMPOSITION

SECTION III PRESTORM WARNING AND EVACUATION

WARNING	17
EVACUATION	18
Plaquemines Parish	19
St. Bernard Parish	21
Orleans Parish	21
St. Tammany Parish	23
Jefferson Parish	24
Lafourche Parish	24
Terrebonne Parish	24
St. Mary Parish	24
Iberia Parish	24
Vermilion Parish	24
Cameron Parish	25

SECTION IV EMERGENCY OPERATIONS

NEW ORLEANS DISTRICT (NOD)	29
ACTIVITY OF OTHER AGENCIES	34

CONTENTS

Page

SECTION V COLLECTION OF STORM DATA

GENERAL	41
COLLECTION OF HYDROLOGIC DATA	41
COLLECTION OF DAMAGE DATA	44
COLLECTION OF ENGINEERING DATA	44

SECTION VI SUMMARY OF STORM DATA—METEOROLOGIC AND HYDROLOGIC

GENERAL	49
METEOROLOGICAL AND HYDROLOGICAL DATA	49
Barometric Pressures	49
Winds	49
Rainfall	52
Temperature	54
Tides	54
Salinity	55

SECTION VII SUMMARY OF STORM DATA—PHYSICAL AND ECONOMIC EFFECTS

GENERAL	61
PLAQUEMINES PARISH	63
General	63
Damages—General	66
Damages—East Bank Above Bohemia	71
Damages—East Bank Below Bohemia	71
Damages—West Bank Above Port Sulphur	72
Damages—West Bank, Port Sulphur to Empire	73
Damages—West Bank, Empire to Buras	74
Damages—West Bank, Buras to Fort Jackson	78
Damages—West Bank, Fort Jackson to Venice	81
Damages—West Bank Below Venice	83

CONTENTS

	<u>Page</u>
ST. BERNARD PARISH	87
General	87
Damages—General	87
Damages—Verret to Yscloskey-Hopedale Area	88
Damages—Reggio-Delacroix Area	91
ORLEANS PARISH	92
General	92
Damages—General	92
Damages—New Orleans Lakeshore Area—IHNC to Jefferson Parish	93
Damages—St. Claude-Claiborne Area—West Bank, IHNC	95
Damages—IHNC Area	96
Damages—New Orleans Lakeshore Area—Airport to Little Woods	96
Damages—Irish Bayou Area	98
Damages—Venetian Isles Area	98
Damages—U. S. Highway 90 Between U. S. Highway 11 and Chef Menteur Pass (Excluding Venetian Isles).	100
Damages—U. S. Highway 90 Between Chef Menteur Pass and the Rigolets	100
ST. TAMMANY PARISH	102
General	102
Damages—General	103
Damages—Treasure Isle	104
Damages—Salt Bayou Road	106
Damages—North Shore and Vicinity	106
Damages—North Shore Beach	107
Damages—Slidell	110
Damages—Mandeville	110
Damages—U. S. Highway 90 North of the Rigolets	110
Damages—Other Areas in St. Tammany Parish	113
OTHER PARISHES	113
Jefferson Parish	113
St. Charles Parish	113
Lafourche Parish	113
St. John the Baptist Parish	113
Tangipahoa Parish	114
PETROLEUM INDUSTRY	114
MARINE AND NAVIGATIONAL DAMAGES	118
FISH AND WILDLIFE	120

CONTENTS

DAMAGES TO FLOOD PROTECTION STRUCTURES	121
ESTIMATE OF STORM DAMAGES PREVENTED BY FEDERAL PROJECTS	123
DAMAGE SUMMARY	124
STORM CASUALTIES	124

SECTION VIII REHABILITATION

SECTION IX NOTABLE ASPECTS

THE HURRICANE	141
THE DAMAGES	141
THE RESPONSE	143

PLATES

Plate No.	Title	Plate Placed After Page No.
1	Survey Index Map	6
2	Camille's Track	10
3	Camille's Wind Field	54
4	Rainfall	54
5	Surge Elevations in the Mississippi River	56
6	Flooded Area Data	62
7	Camille's Impact on Oil Production Facilities	114

EXHIBITS

DAMAGE DATA

Title	Number
Flooded Area, Vicinity Venice-Boothville.	1
Flooded Area, Vicinity Buras-Empire	2
Flooded Area, Vicinity Port Sulphur-City Price.	3
Flooded Area, Point Celeste to Belair	4
Flooded Area, Belair to Belle Chasse	5
Flooded Area, St. Bernard.	6
Flooded Area, New Orleans	7
Flooded Area, Chef Menteur-Rigolets	8
Flooded Area, North Shore to Slidell	9
Meteorological Data	10
Temperatures	11
Weather Station Data, Entrance to Southwest Pass	12
Weather Station Data, Garden Island Bay	13
Weather Station Data, Boothville, La.	14
Weather Station Data, Port Sulphur, La.	15
Weather Station Data, New Orleans, La.	16
Weather Station Data, Lake Pontchartrain at West End, La. . . .	17
Weather Station Data, New Orleans International Airport	18
Weather Station Data, New Orleans, La.	19
Weather Station Data, Bay St. Louis, Miss.	20
Weather Station Data, Picayune, Miss., and Bogalusa, La.	21
Maximum Water Elevations, Central Gulf Coast Line	22
Record High-Water Elevations Resulting from Tropical Storms, 1909-1969.	23
Highway Profiles Along the Mississippi River.	24
Tide Gage Data Along the Louisiana Coast (in 4 sheets).	25
Tidal Station Data, Southwest Pass at East Jetty, La.	26
Tidal Station Data, South Pass at Port Eads, La.	27
Tidal Station Data, Empire, La.	28
Tidal Station Data, West Pointe a la Hache, La.	29
Tidal Station Data, Alluvial City, La.	30
Tidal Station Data, Shell Beach, La.	31
Tidal Station Data, Chalmette, La.	32
Tidal Station Data, Algiers Lock, La.	33
Tidal Station Data, Mississippi River-Gulf Outlet, New Orleans, La.	34
Tidal Station Data, Mississippi River, New Orleans, La.	35
Tidal Station Data, Inner Harbor Navigation Canal, New Orleans, La.	36
Tidal Station Data, Lake Pontchartrain at West End, La.	37
Tidal Station Data, Lake Pontchartrain at Midlake, La.	38
Tidal Station Data, Mandeville, La.	39
Tidal Station Data, Lake Pontchartrain near South Shore, La. . .	40
Tidal Station Data, Rigolets at U. S. Hwy 90	41
Tidal Station Data, Chef Menteur Pass	42

EXHIBITS

DAMAGE DATA

Title	Number
Salinity Data	43
Comparative Conductivity (Salinity) Data	44
Shoal Comparison, Mississippi River-Gulf Outlet.	45
Hurricane Protection, Morgan City, La., and Vicinity	46
Hurricane Protection, Grand Isle, La., and Vicinity	47
Hurricane Protection, New Orleans to Venice, La.	48
Hurricane Protection, Lake Pontchartrain and Vicinity, La.	49
Buras, La.	50
Boothville, La.	51

APPENDIX I

U. S. WEATHER BUREAU ADVISORIES AND BULLETINS ON HURRICANE CAMILLE

EXPLANATORY NOTES

LIST OF ABBREVIATIONS

AHP	Above Head of Passes
ASCS	Agricultural Stabilization and Conservation Service
CDT	Central Daylight Time
cfs	Cubic feet per second
Corps	U. S. Army Corps of Engineers
DPW	State of Louisiana, Department of Public Works
DRC	Disaster Recovery Center
EDT	Eastern Daylight Time
EOC	Emergency Operations Center
ESSA	Environmental Science Services Administration
GIW	Gulf Intracoastal Waterway
HEW	U. S. Department of Health, Education and Welfare
HUD	U. S. Department of Housing and Urban Development
IHNC	Inner Harbor Navigation Canal
mph	Miles per hour
MR-GO	Mississippi River-Gulf Outlet
NASA	National Aeronautics and Space Administration
NOD	New Orleans District, U. S. Army Corps of Engineers
OCD	Office of Civil Defense
OE	Office of Education
OEP	Office of Emergency Preparedness
PHS	U. S. Public Health Service
PL 79	Public Law 79, 91st Congress
PL 99	Public Law 99, 84th Congress
PL 309	Public Law 309, 88th Congress
PL 875	Public Law 875, 81st Congress
ppm Cl ⁻	Parts per million of chlorides
SBA	Small Business Administration
USC&GS	U. S. Coast and Geodetic Survey
USDA	U. S. Department of Agriculture

GENERAL NOTES ON TEXT

1. All times shown are Central Daylight Time (CDT) unless otherwise stated.
2. Information concerning Camille's course and weather phenomena associated with the storm was extracted from U. S. Weather Bureau publications except where noted.
3. Tidal data was compiled from records of the Corps of Engineers, the Louisiana Department of Public Works, and private industry. Salinity information was extracted from Corps of Engineers records.
4. Unless otherwise specified, all elevations in this report are in feet referred to mean sea level datum (1951 U. S. Coast and Geodetic Survey levels). Levels run by USC&GS in 1965 indicated a general settlement in the overflowed area within the New Orleans District of about 0.8 foot. Elevations herein may accordingly be approximately conformed to the 1965 levels by subtracting 0.8 foot from the values given.

GEOGRAPHICAL LOCATIONS OF PHOTOGRAPHS

<u>Page</u>	<u>Photo No.</u>	<u>Location</u>
4	1	Buras, La.
	2	Long Beach, Miss.
	3	Lovingston, Va.
5	4	Boothville-Venice Area, La.
6	5	Treasure Isle, La.
11	6	North Shore, La.
12	7	Gulfport, Miss.
	8	Gulfport, Miss.
	9	Bay St. Louis, Miss.
13	10	Biloxi, Miss.
	11	Biloxi, Miss.
	12	Biloxi, Miss.
19	13	New Orleans, La.
20	14	Belle Chasse, La.
	15	Belle Chasse, La.
22	16	New Orleans, La.

GEOGRAPHICAL LOCATIONS OF PHOTOGRAPHS (CONTINUED)

<u>Page</u>	<u>Photo No.</u>	<u>Location</u>
23	17	Belle Chasse, La.
	18	New Orleans, La.
25	19	North Shore, La.
32	20	Plaquemines Parish, La.
	21	Empire, La.
	22	Empire, La.
35	23	Booth-Venice Area, La.
	24	Sunrise, La.
	25	Boothville-Venice Area, La.
37	26	Mississippi Gulf Coast
42	27	Venice, La.
	28	Venice, La.
	29	Triumph, La.
	30	Triumph, La.
43	31	Triumph, La.
	32	Triumph, La.
	33	Boothville, La.
	34	Boothville, La.
45	35	Empire, La.
	36	Empire, La.
50	37	Buras, La.
	38	Boothville, La.
	39	Empire-Buras Area, La.
51	40	Sunrise-Buras Area, La.
	41	Buras, La.
	42	Boothville, La.
53	43	Richmond, Va.
	44	Scottsville, Va.
	45	Lovingston, Va.
54	46	Buras-Gulftown Area, La.
56	47	Buras, La.
	48	Buras, La.
	49	Triumph, La.
57	50	Slidell Area, La.

GEOGRAPHICAL LOCATIONS OF PHOTOGRAPHS (CONTINUED)

<u>Page</u>	<u>Photo No.</u>	<u>Location</u>
64	51	Plaquemines Parish, La.
65	52	Below Fort Jackson, La.
66	53	Plaquemines Parish, La.
67	54	Buras-Gulftown Area, La.
	55	Buras-Gulftown Area, La.
69	56	Buras-Gulftown Area, La.
	57	Buras-Gulftown Area, La.
73	58	Empire, La.
75	59	Buras, La.
76	60	Sunrise-Buras Area, La.
	61	Sunrise, La.
	62	Sunrise-Buras Area, La.
78	63	Triumph, La.
79	64	Buras, La.
	65	Buras, La.
	66	Buras, La.
80	67	Gulftown, La.
	68	Gulftown, La.
82	69	Fort Jackson, La.
84	70	Venice, La.
	71	Boothville-Venice Area, La.
85	72	Boothville-Venice Area, La.
	73	Boothville-Venice Area, La.
86	74	South Pass, La.
	75	Pilottown, La.
90	76	Yscloskey, La.
94	77	New Orleans, La.
101	78	Rigolets, La.
103	79	Near Treasure Isle, La.

GEOGRAPHICAL LOCATIONS OF PHOTOGRAPHS (CONTINUED)

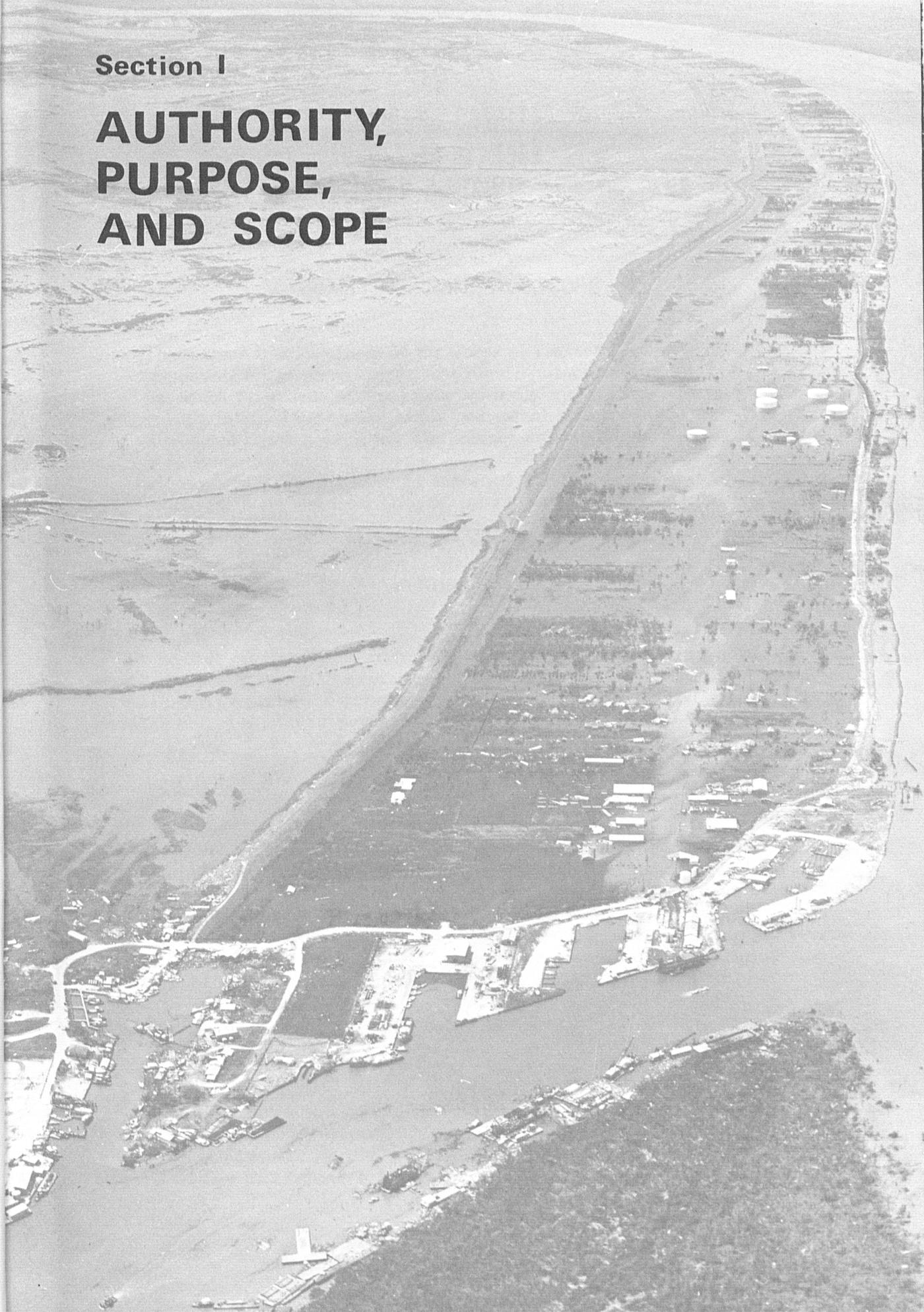
<u>Page</u>	<u>Photo No.</u>	<u>Location</u>
105	80	Treasure Isle, La.
	81	Treasure Isle, La.
	82	Treasure Isle, La.
108	83	North Shore, La.
	84	North Shore, La.
109	85	North Shore, La.
	86	North Shore, La.
116	87	Boothville-Venice Area, La.
	88	Boothville-Venice Area, La.
	89	Boothville-Venice Area, La.
117	90	Boothville-Venice Area, La.
	91	Boothville-Venice Area, La.
118	92	Fort Jackson, La.
119	93	Fort Jackson, La.
	94	Grand Pass, La.
	95	East Jetty, La.
122	96	Boothville-Venice Area, La.
	97	Triumph, La.
130	98	Boothville-Venice Area, La.
	99	Venice, La.
131	100	Empire, La.
	101	Buras, La.
	102	Buras, La.
	103	Venice, La.
132	104	Sunrise, La.
	105	Buras, La.
	106	Boothville, La.
135	107	Buras, La.
137	108	Sunrise, La.
	109	Boothville-Venice Area, La.
142	110	Biloxi, Miss.
	111	Fort Jackson, La.
	112	Pass Christian, Miss.
144	113	Venice, La.

GEOGRAPHICAL LOCATIONS OF PHOTOGRAPHS (CONTINUED)

<u>Page</u>	<u>Photo No.</u>	<u>Location</u>
144	114 115	Boothville-Venice Area, La. Boothville, La.
145	116 117 118	Plaquemines Parish, La. Treasure Isle, La. Plaquemines Parish, La.
146	119	Mississippi Gulf Coast

Section I

**AUTHORITY,
PURPOSE,
AND SCOPE**



**REPORT
ON
HURRICANE CAMILLE
AUGUST 14-22, 1969
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS**

**SECTION I
AUTHORITY, PURPOSE, AND SCOPE**

The various District offices of the Corps of Engineers (Corps) are responsible for preparing reports on natural disasters involving flooding which occur within their respective boundaries. These reports contain information on the nature and extent of the disaster and subsequent recovery activities. The primary purpose of these reports is to guide the Corps in planning and carrying out its projects. In addition, these reports serve an important function as a reference source for State and local officials, private business firms, and the general public.

AUTHORITY

This report on damages and phenomena accompanying Hurricane Camille has been prepared in accordance with ER 500-1-1, dated Septem-

ber 1, 1967, and the authorization of the Chief of Engineers contained in teletype message (ENGCW-CE-643), dated August 19, 1969.

PURPOSE

The report deals primarily with Hurricane Camille's impact on Louisiana in the areas which were flooded. It is intended to serve as a reference source for information relative to the storm, its physical and economic effects, and the public

response to it. Since part of the Corps mission is protecting developed areas from hurricane-created flooding, this report will be of particular value in evaluating hurricane protection needs and planning projects responsive to these needs.

SCOPE

In addition to detailed coverage of damages caused by Camille in Louisiana, this report includes information on the hurricane's for-

mation, course, and overall effects. The New Orleans District (NOD) of the Corps of Engineers includes nearly all of the area in

CAMILLE WILL NOT BE FORGOTTEN...



Photograph by Delaune

IN LOUISIANA...

WHAT WAS NOT DESTROYED BY THE STORM'S INITIAL IMPACT WAS RUINED BY WATER THAT STOOD MORE THAN 15 DAYS IN SOME PLACES

IN MISSISSIPPI...

MANY OF THE OLD, FAMILIAR LAND-MARKS ON THE MISSISSIPPI GULF COAST WERE LOST TO CAMILLE'S SAVAGE WINDS AND TIDES



IN VIRGINIA.

TWO DAYS AFTER HER RAMPAGE ALONG THE GULF COAST, CAMILLE SUDDENLY AND SWIFTLY DUMPED DISASTROUS RAINS IN VIRGINIA CAUSING FLASH FLOODS AND MASSIVE MUDSLIDES

Louisiana which was affected by Hurricane Camille. For that portion of the NOD which was inundated by the hurricane surge, the information presented herein is quite comprehensive. For areas not overflowed and/or not within the boundaries of the NOD, the information presented is skeletal in nature and is included primarily in the interest of an adequate portrayal of the overall event.

Information in the following broad categories is included in this report:

- a. hydrological and meteorological aspects of the storm;
- b. description of flooded areas and the extent of damages;
- c. description of the damage surveys performed, and monetary estimates of damages in the flooded areas;
- d. estimates of flood damages prevented by existing Federal

flood control works;

- e. and estimates of damages that could have been prevented by projects which are now authorized.

The report also includes plan layouts for four authorized hurricane protection projects in the NOD.

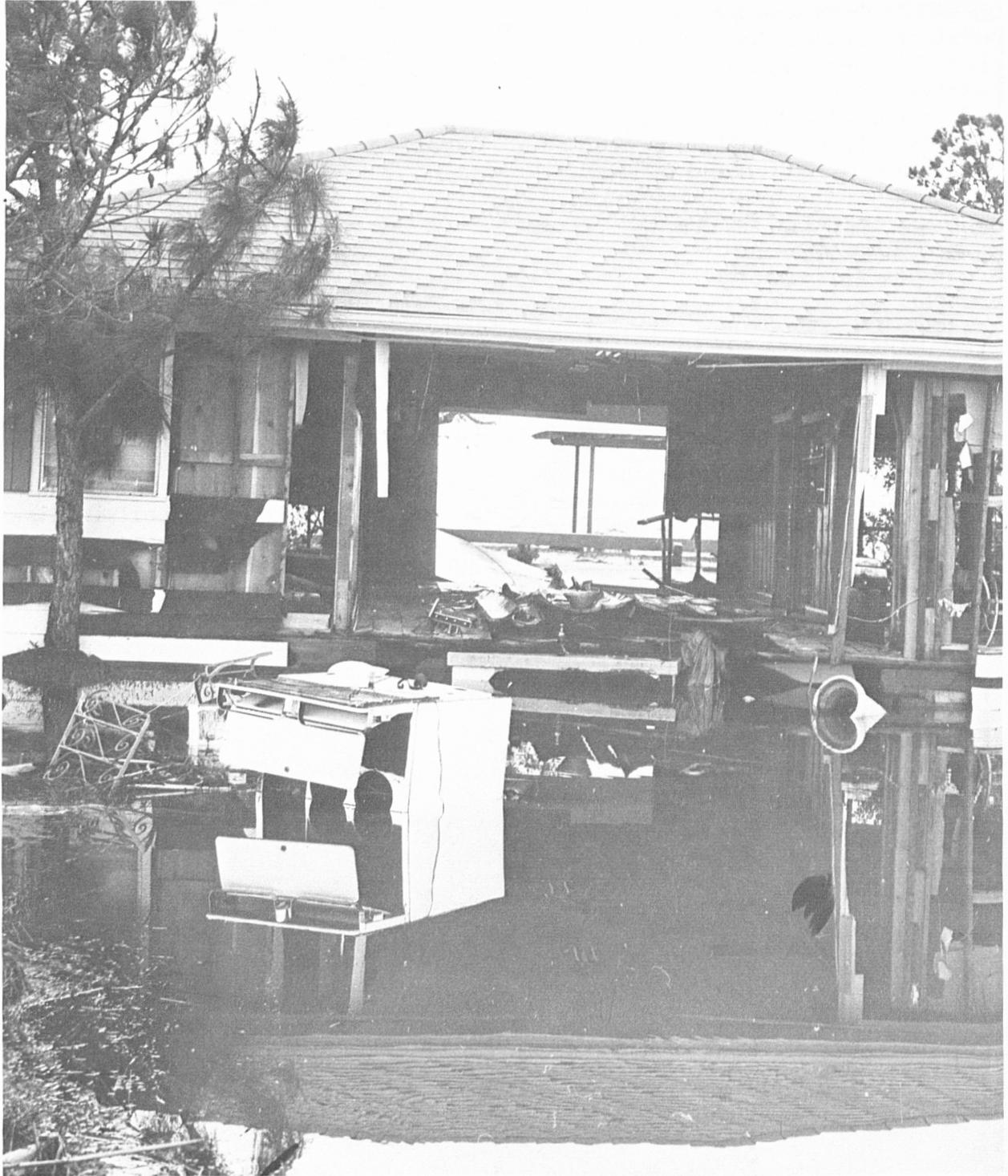
The Mississippi and Alabama Gulf Coast is within the Mobile District of the Corps of Engineers. A report published by that district contains information on the coastal area similar to the information in this report.

Plate 1 shows the areas surveyed by New Orleans and Mobile Districts.

The area of Virginia which was devastated by Camille's torrential rains is within the Norfolk District of the Corps of Engineers. That district is also preparing a report on the effects of Hurricane Camille.



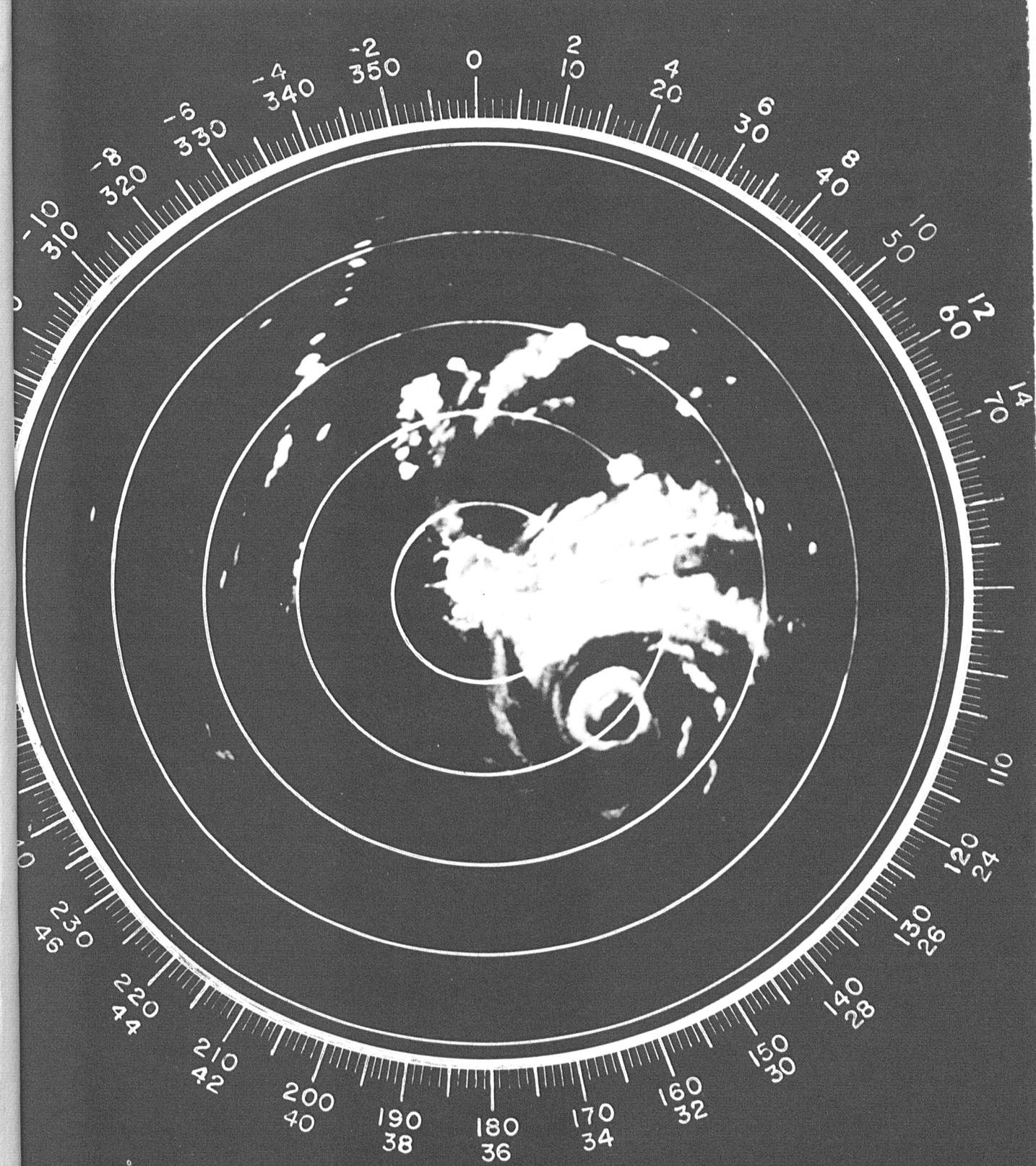
VEHICLES WITH HIGH GROUND CLEARANCE WERE ESSENTIAL IN EARLY INSPECTION AND RECOVERY ACTIVITIES IN PLAQUEMINES PARISH



Courtesy Slidell-Saint Tammany Times

ON LAKE PONTCHARTRAIN, A GUTTED HOME FRAMES NOW PLACID WATERS— BUT EVERYWHERE THE SIGNS OF THE RECENT VIOLENCE ARE EVIDENT





Section II

THE HURRICANE - CHRONOLOGY AND COMPOSITION

SECTION II THE HURRICANE—CHRONOLOGY AND COMPOSITION

Camille's journey covered the period August 14-22.^a In that period, the hurricane passed over the western tip of Cuba, traversed the central Gulf of Mexico, sideswiped the delta of the Mississippi River, and made landfall on the Mississippi Gulf Coast. Camille's track took her center through the States of Louisiana, Mississippi, Tennessee, Kentucky, West Virginia, and Virginia. Then she entered the Atlantic off the Virginia coast, and ended her 8-day life by merging with a frontal system some 175 miles southeast of Cape Race, Newfoundland. While in the Gulf of Mexico, Camille was characterized by an extremely low central pressure—26.61 inches of mercury—a steep pressure gradient and correspondingly high winds—in excess of 200 miles per hour (mph). The hurricane track is shown on Plate 2.

A tropical wave moved west off the African coast on August 5 and generally followed the 15th parallel. On August 9, this inverted "V" cloud pattern, then located about 480 miles east of the northern Leeward Islands, was recognized as a tropical disturbance. Thursday morning, August 14, a Navy plane flew into the disturbance which was then located 60 miles west of Grand Cayman or 480 miles south of Miami. The depression developed rapidly and reached tropical storm intensity while the aircraft was still in the area. The storm, moving northwesterly at 12 to 14 mph with highest winds of about 60 mph, was christened Camille. By 5 o'clock^b that afternoon, gale force winds extended outward 70 to 100 miles in the northern semicircle of the storm.

Camille reached hurricane force early Friday morning, August 15. Later that morning, a reconnaissance flight estimated the highest winds at 90 mph with conditions favorable for further intensification.

As Camille moved toward the southwest coast of Cuba on Friday afternoon, it became evident that this would be a major hurricane. Maximum winds were then 115 mph with gales extending out 125 to 150 miles to the north of the center and 50 miles to the south. Forward movement was 7 mph. Surface observations and satellite pictures indicated that Camille would take a more northerly course as she crossed over Cuba.

Friday evening, Camille was picked up on the Key West radar. The center of the hurricane was located over western Cuba about 250 miles south-southwest of Key West. By 10 o'clock that night, Camille had raked the extreme western tip of Cuba and was headed for the open Gulf. Maximum winds were reduced to about 100 mph as the storm crossed over Cuba but further intensification was expected as the hurricane moved into the Gulf.

Early Saturday morning with the storm located about 420 miles south of Panama City, Florida, a hurricane watch was ordered for the

^a Information concerning Camille's course and weather phenomena associated with the storm was extracted from U. S. Weather Bureau publications.

^b All times shown are Central Daylight Time (CDT) unless otherwise stated.

Gulf coast from Biloxi, Mississippi, to St. Marks, Florida. Although the storm continued to move north-northwest at about 10 mph, it was expected to make a gradual turn to the north during the night with a slight increase in forward speed.

By 11 o'clock Saturday morning, the Weather Bureau was issuing urgent warnings calling Camille "small but dangerous." The winds were back up to 115 mph and expected to intensify further. At this time, hurricane warnings were issued for the northwest Florida coast from Fort Walton to St. Marks.

By late Saturday afternoon, Camille was being called "a very intense and dangerous storm" with winds estimated to be 150 mph near the center. A hurricane watch continued in effect from Fort Walton to Biloxi, with warnings from Fort Walton to St. Marks. The storm was then 365 miles south of Fort Walton.

By Sunday morning, Camille had shifted westward threatening the Mississippi, Alabama, and northwest Florida coasts. Hurricane warnings were extended westward to Biloxi with a hurricane watch and gale warnings in effect as far west as New Orleans and Grand Isle. Highest winds were an estimated 160 mph with the storm center located about 250 miles south of Mobile, Alabama. The storm, with a forward speed of 12 mph, was expected to turn north and move inland near Mobile Sunday night. At this time, hurricane force winds extended outward 50 miles, and gales 150 miles, from the center of the storm.

The storm continued to move toward the mouth of the Mississippi River and by 9 o'clock in the morning hurricane warnings were extended to New Orleans and Grand Isle, although a change to a more northerly course was still expected. Gale warn-

ings were issued for as far west as Morgan City, Louisiana. Although St. Marks was the eastern limit of the warning area, the threat to the Florida coast appeared to be decreasing.

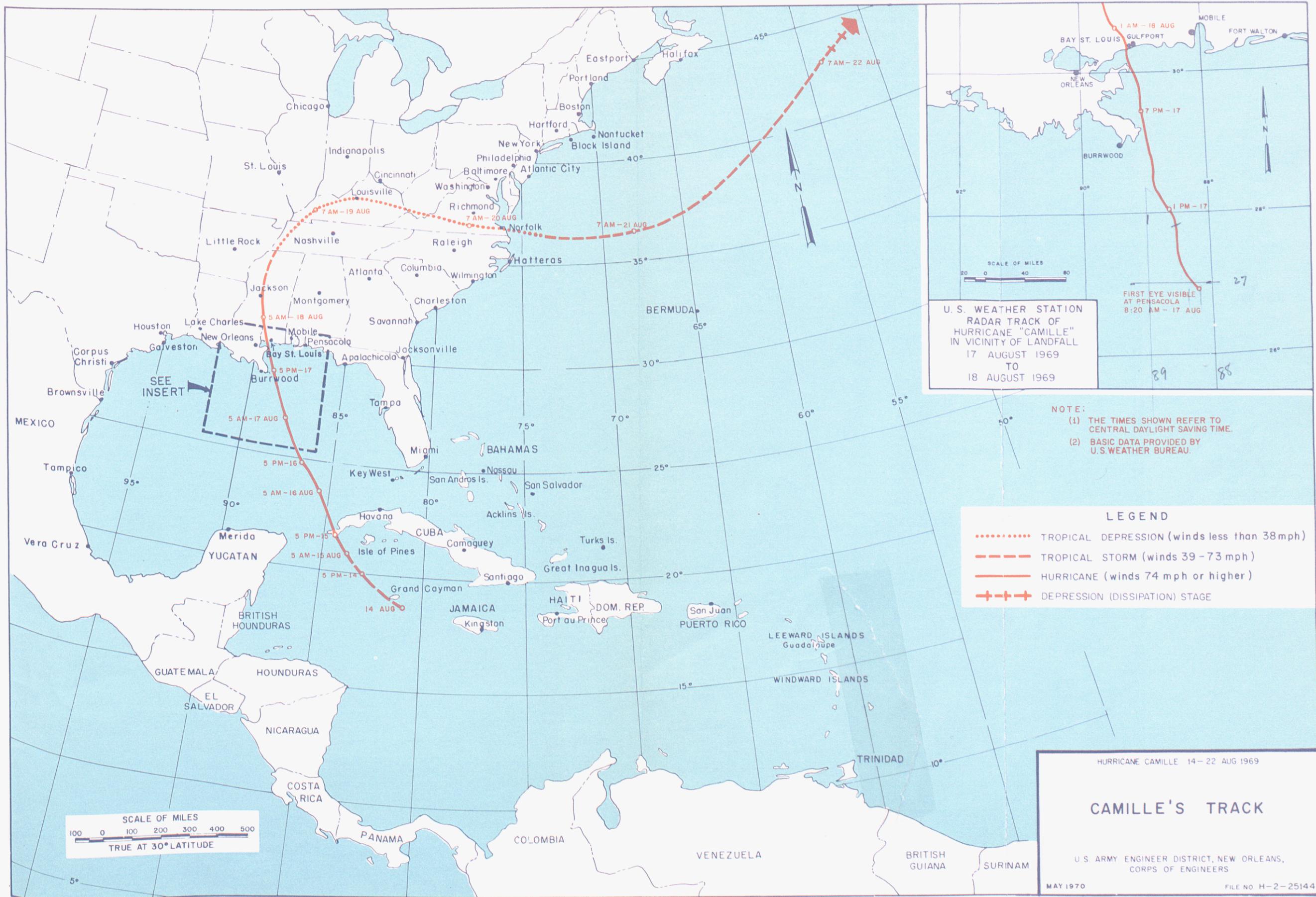
Warnings east of Apalachicola, Florida, were discontinued at 3 o'clock Sunday afternoon. The storm was located about 120 miles southeast of New Orleans and was expected to pass close to the mouth of the Mississippi River late in the afternoon. At this time a new estimate of the hurricane's winds was issued—Camille's winds were now estimated at 190 mph near the center. Later data from the Weather Bureau indicate that winds were as high as 201.5 mph. The hurricane was expected to move inland near Gulfport early Sunday night.

Sunday afternoon the storm's central barometric pressure was recorded as 26.61 inches. This pressure is second only to the Labor Day hurricane of 1935, which developed a central pressure of 26.35 inches, the lowest recorded in the western hemisphere. The eye of the storm, indeed, the storm itself, remained unusually compact.

By 7 o'clock Sunday night, Camille was 70 miles east-southeast of New Orleans and 60 miles south of Gulfport. The storm's western quadrants had sideswiped the mouth of the Mississippi River and were raking southeastern Louisiana. Estimated wind velocities of 140 to 160 mph were reported at Garden Island Bay and Pilottown, Louisiana, while tide levels up to elevation 16 feet above mean sea level^a overwhelmed the protective levee system and flowed into the developed areas. Widespread devastation resulted from Buras to Venice.

At 9 o'clock the storm was 35 miles south of Gulfport and 60 miles

^a Unless otherwise specified, all elevations in this report are in feet referred to mean sea level datum (1951 U. S. Coast & Geodetic Survey levels). Levels run by USC&GS in 1965 indicate a general settlement in the overflowed area within the New Orleans District of about 0.8 foot. Elevations herein may accordingly be approximately conformed to the 1965 levels by subtracting 0.8 foot from the values given.



east of New Orleans, and heading north. Shortly before midnight, Camille went inland in the Waveland-Bay St. Louis area. Wind and tide reports from land-based stations in Mississippi varied because much of the measuring equipment was destroyed. However, some who remained in the area estimated winds to be 160 mph, and the Weather Bureau received estimates of gusts of up to 200 mph near the center of the storm. At Pass Christian, a reliable high-water mark of 22.6 feet was found; less reliable debris marks of 24.6 and 24.2 were also found in the vicinity.

By 1 o'clock Monday morning, Camille had passed inland and was located 10 to 15 miles east of Picayune, Mississippi. The storm weakened as it moved over southern and central Mississippi, but the Weather Bureau continued to warn of tornadoes and heavy rains. Camille had become a tropical depression before crossing the northern border of Mississippi.

On Monday and Tuesday, Camille caused heavy rains in Tennessee, Kentucky, and West Virginia. However, as she turned eastward and headed for the Atlantic, Camille appeared to have spent her fury.

Then on Tuesday night and early Wednesday morning, she came to life with vicious suddenness. Torrential rains caused disastrous floods and mudslides in the extreme southeastern portion of West Virginia and in central Virginia. Within 8 hours, Camille dumped up to 27 inches of rain in central Virginia.

After leaving Virginia, Camille entered the Atlantic. Moving to the northeast, she merged with a frontal system at 11 o'clock in the morning on Friday, August 22, and lost her identity as a tropical storm.

Appendix 1 contains all advisories and bulletins issued by the Weather Bureau concerning Camille.

As of March 1, 1970, the number of persons known to have died as a result of Camille totaled 262: 137 along the Gulf coast in Mississippi, 9 in Louisiana, 114 in Virginia, and 2 in West Virginia. Total deaths may be higher since people are still missing.

The damages left in Camille's wake approximate \$1.0 billion including \$581 million in Mississippi and Alabama, \$250 million in Louisiana, and \$140 million in Virginia. Losses occurring in other states were relatively minor. It will be many years before the worst-hit areas recover from Camille.

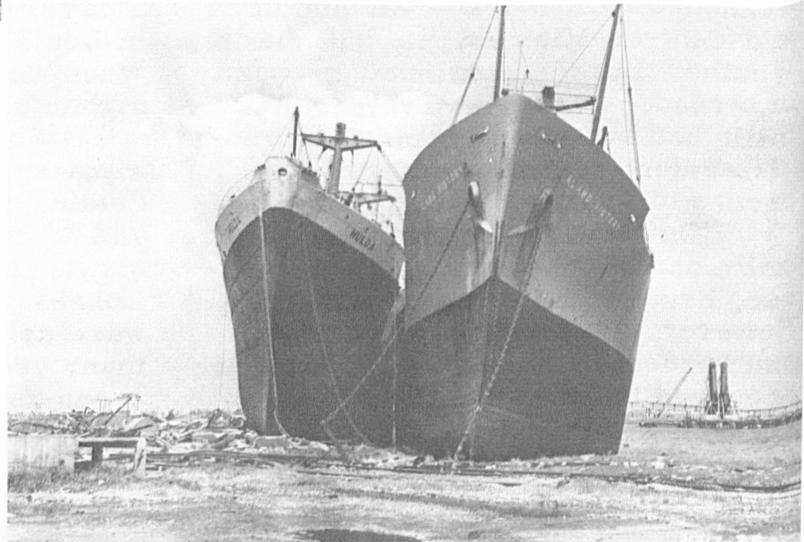


ON LAKE PONTCHARTRAIN'S NORTH SHORE, SEARCHERS SORT THROUGH THE RUBBLE LEFT IN THE STORM'S WAKE

CAMILLE'S FULL FURY LASHED THE
MISSISSIPPI GULF COAST AND...



Gulfport



Gulfport



Bay St. Louis

INFLECTED DAMAGE FAR BEYOND
ANY PREVIOUSLY EXPERIENCED

Biloxi



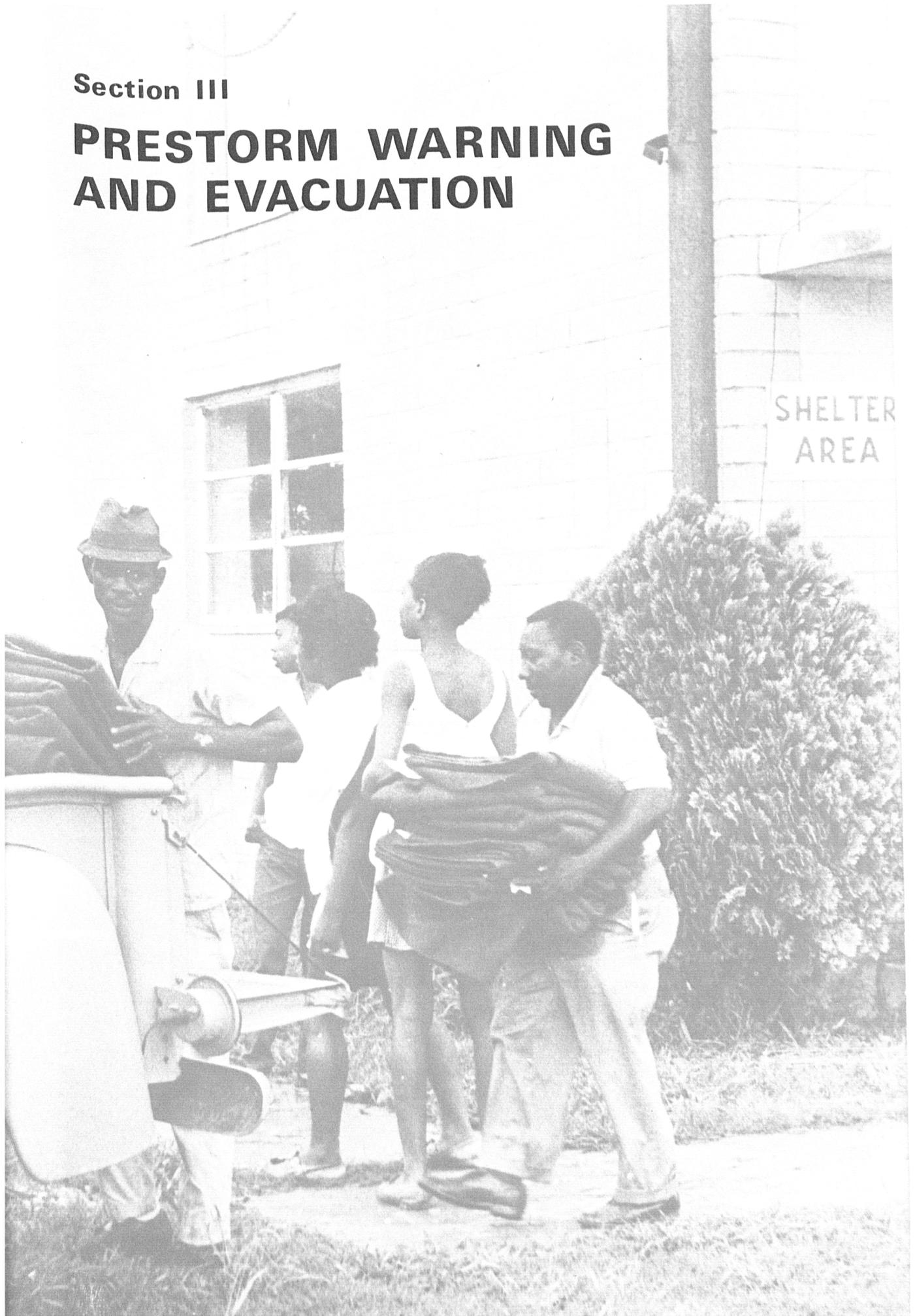
Biloxi



Biloxi

Section III

**PRESTORM WARNING
AND EVACUATION**



SECTION III PRESTORM WARNING AND EVACUATION

A hurricane watch was in effect for the Louisiana coast as far west as Grand Isle for 18 hours prior to Camille's landfall, and a hurricane warning was in effect for 14 hours. The actual location of landfall was predicted, within narrow limits, by the Weather Bureau 8 hours before the hurricane actually came ashore. Evacuation in coastal Louisiana was effective and the relatively low death toll in that state is largely explainable in terms of the effectiveness of evacuation measures.

WARNING

From the time that Camille was discovered near Grand Cayman in the Caribbean, until she moved ashore on Mississippi's Gulf Coast, a period of about 3-1/2 days elapsed. During that period the Weather Bureau issued 18 advisories and 18 bulletins of a general nature, and numerous statements and special bulletins of specific interest to particular areas.

In the initial advisory at 1 p.m. Eastern Daylight Time (EDT) on Thursday, August 14, the Weather Bureau warned that "...All interests in South Florida and the Florida Keys should be alert to advisories later today which may require rapid protective action in some areas...."

In a bulletin issued at 3 p.m. EDT on Friday, August 15, it was reported that Camille "...will not reach any [U.S.] land areas before early Sunday...." The same bulletin advised interests in the Florida Keys and the west coast of Florida to "...keep in close touch with future advices...."

At 9 p.m. EDT, Camille's eye was over extreme western Cuba, and a bulletin warned that "...all interests along the eastern Gulf of Mexico should remain in close touch with all future advisories and bulletins...."

Advisory No. 7, issued at 12 midnight EDT on Saturday, August 16, stated that "...A hurricane watch will probably be issued for a portion of the coastal area of the northeast Gulf by or prior to noon Saturday...."

At 9 a.m. EDT on Saturday, Special Advisory No. 9 placed a hurricane watch in effect from Biloxi, Mississippi, to St. Marks, Florida, and indicated that "...specific hurricane warnings will be issued for portions of this coastline at noon today...."

Advisory No. 10, issued at 11 a.m. CDT, set up hurricane warnings for the northwest Florida coast from Fort Walton to St. Marks, and gale warnings elsewhere from Pensacola to Cedar Key.

A bulletin at 1 p.m. warned that "...preparations for hurricane force winds and 5- to 10-foot tides in the area from Fort Walton to St. Marks should be complete tonight...." In Advisory No. 11, issued at 5 p.m., the estimate of tide heights was raised from 5 to 10 feet to 5 to 12 feet.

At 5 a.m. on Sunday, August 17, Advisory No. 13 extended hurricane warnings westward to Biloxi, with a hurricane watch to New Orleans and Grand Isle. This

advisory contained the first predicted landfall which was Mobile, Alabama. It was predicted that during the day winds would increase and tides would begin to rise on the northern Gulf coast from Grand Isle eastward.

The 7 a.m. bulletin warned that "...unless the anticipated turn to a more northerly course occurs within the next few hours it will be necessary to extend hurricane warnings into the area of hurricane watch...."

In Advisory No. 14, issued at 9 a.m., it was stated that "...Present indications are that the center of Camille will pass close to the mouth of the Mississippi and move inland on the Mississippi coast tonight...." In this advisory hurricane warnings were extended westward to include "...all of the Mississippi coast and southeastern Louisiana as far west as New Orleans and Grand Isle...."

Advisory No. 15, issued at 11 a.m., reiterated that "...the center of Camille will pass close to the mouth of the Mississippi River late this afternoon and move inland on the Mississippi coast tonight...."

Special Advisory No. 16, issued at 3 p.m., reported that Camille was "...near the mouth of

the Mississippi River....Bearing down on the Mississippi-Alabama coast...." This advisory predicted landfall near Gulfport. Advisory No. 17 at 5 p.m. repeated this prediction.

At 9 p.m., a bulletin reported that Camille had passed the mouth of the Mississippi River and was continuing toward the Mississippi-Alabama coast.

In Advisory No. 18 issued at 11 p.m., Camille was reported "...moving inland near Gulfport...."

Summarizing the above: At the time of landfall, the area subject to the hurricane's effects was under hurricane watch for a period which varied from 38 hours at its eastern extremity to 18 hours at the west. The same area was under hurricane warning for corresponding periods of 18 and 14 hours.

The first prediction of landfall location was published 18 hours before actual landfall, and the first predicted landfall location—Mobile—was about 70 miles east of actual landfall location. Fourteen hours prior to actual landfall, it was predicted that Hurricane Camille would come ashore on the Mississippi coast.

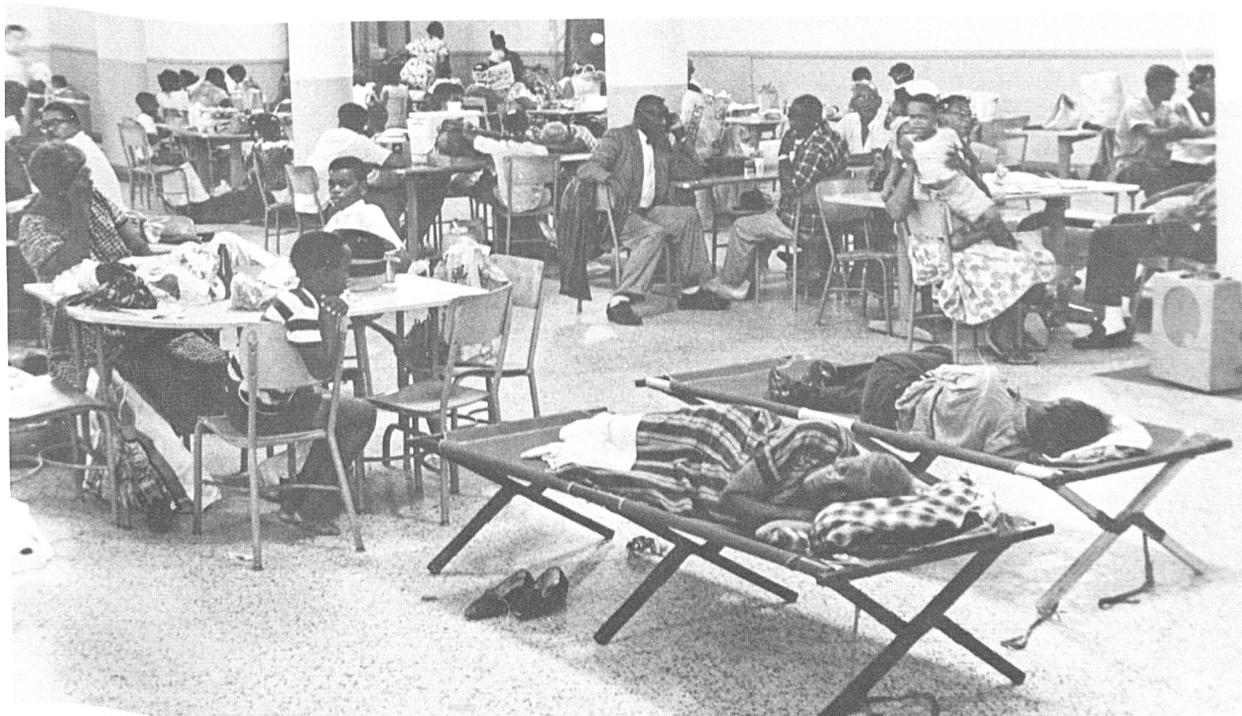
The final prediction of landfall location was made 8 hours before its occurrence.

EVACUATION

Residents of areas in Louisiana which are subject to tidal overflow are quite aware of and sensitive to the hurricane threat. Such killer storms as Audrey in 1957 (556 dead) and Betsy in 1965 (81 dead) are well remembered, and those in flood-prone areas are usually quick to leave if at all practicable. In the heavily developed areas of metropolitan New Orleans, with a popula-

tion of over 1 million, prestorm evacuation in most cases is not feasible and, under conditions of full storm fury, rapid action in response to specific threats must be relied on for safety.

As Camille moved in, evacuation was required in a number of locations in Louisiana which were threatened with flooding. An estimated 150,000 persons living in



Courtesy of American Red Cross

RED CROSS SHELTERS LIKE THIS ONE AT THE BOOKER T. WASHINGTON HIGH SCHOOL HOUSED REFUGEES FROM CAMILLE

southeast Louisiana left their homes for refuge in higher, better protected areas, or areas farther from the storm's path. An estimated 69,400 evacuees living in low-lying coastal regions were motivated primarily by the threat of flooding. The parish-by-parish breakdown of this total is shown in the following tabulation.

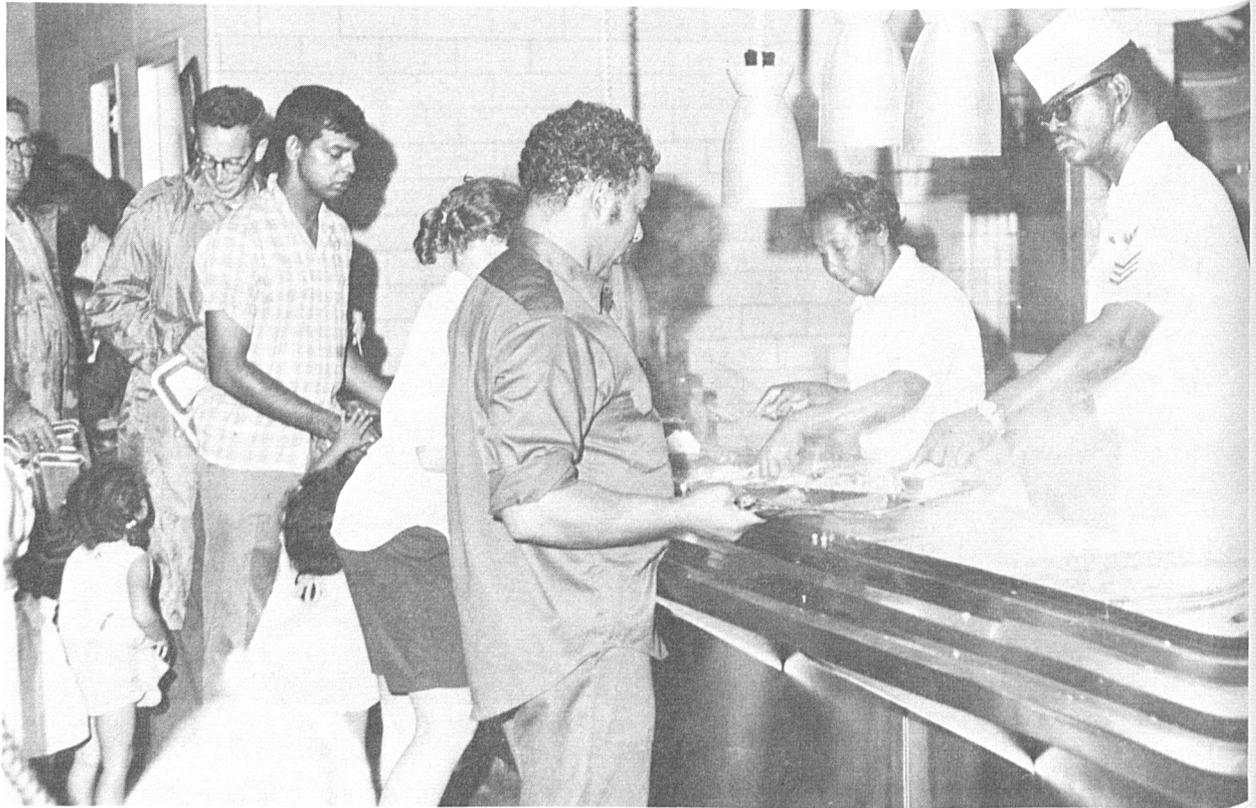
<u>Parish</u>	<u>Number of Evacuees</u>
Cameron	1,500
Iberia	400
Jefferson	2,200
Lafourche	11,000
Orleans	20,000
Plaquemines	17,800
St. Bernard	6,700
St. Mary	2,000
St. Tammany	2,000
Terrebonne	5,500
Vermilion	300
Total	69,400

The first evacuation efforts were initiated late Saturday afternoon as residents of prominently exposed areas began to leave. Pre-storm evacuation was essentially completed by late Sunday afternoon. Certain areas were, however, evacuated during and after passage of the storm.

Details of evacuation activities in certain of the coastal parishes of Louisiana are contained in the following paragraphs.

Plaquemines Parish

Evacuation of the low-lying area between Empire and the mouth of the Mississippi River began on Saturday, August 16, at 7 p.m. and proceeded slowly at first. By 10 p.m. Saturday, only 10 persons were reported at the main evacuation center, the Belle Chasse High



Courtesy of U. S. Navy Department

FOOD AND BEDDING WERE MAJOR PROBLEMS FOR THE THOUSANDS OF EVACUEES FROM PLAQUEMINES PARISH. THE NAVAL AIR STATION WAS BUT ONE OF MANY SHELTERS TO ANSWER THE NEED

School. Sunday morning at 11 o'clock, there were 410 people at the center and by 2 p.m. the number had risen to 700.

In addition, 231 persons had checked into Scottsville High School near Belle Chasse by early Sunday afternoon. Hot meals were served in the school cafeterias.

Some 1,800 persons (about capacity) were housed at the U. S. Naval Air Station at Alvin Callender Field in Belle Chasse.

An estimated 17,800 persons moved out of their homes during the evacuation which began Saturday night. Approximately 3,300 of them were housed in the Plaquemines Parish shelters at Belle Chasse. Other evacuees went to New Orleans hotels and the homes of friends and relatives.

The New Orleans-bound lane of the Belle Chasse Highway was choked with traffic Sunday morning and afternoon with traffic moving very slowly at some points. Cars were loaded with clothes and other belongings, and many were towing boats, trailers, campers, or other vehicles.

The evacuation progressed smoothly, and before the storm struck at 7:45 p.m. on Sunday, essentially all of the people had left the lower areas.

After the storm had passed, the Red Cross turned the shelters at Belle Chasse and Scottsville into semipermanent facilities to provide temporary housing for those rendered homeless, and a new semi-permanent shelter was opened at Port Sulphur late on Tuesday, August 19.

St. Bernard Parish

Early Sunday morning, August 17, the Sheriff of St. Bernard Parish ordered all low-lying areas of the parish evacuated. This in-

cluded Delacroix Island, Reggio, Yscloskey, Shell Beach, Hopedale, and Verret. By 2 p.m., most of the people from these areas had moved out and by 10 o'clock Sunday night, some 2,400 people were housed in evacuation centers in the parish.

Boats, amphibious vehicles, trucks, fuel, small generators, and other equipment were ready for use, and all shelters were equipped with medical help, emergency lighting, and stocks of food.

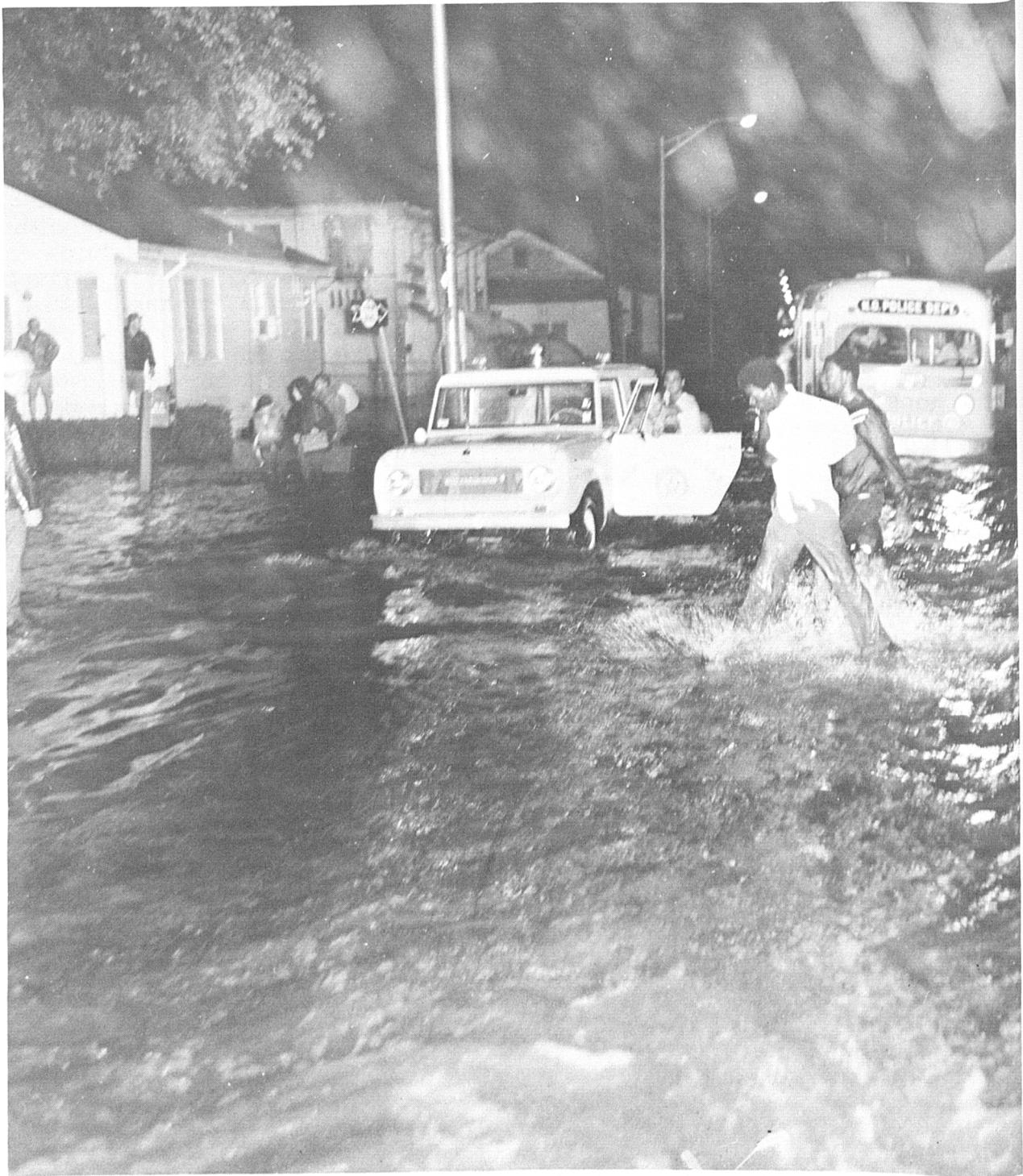
Early Monday morning, after being notified that water was overtopping the levee on the downtown (east) side of the Inner Harbor Navigation Canal (IHNC), the Parish Sheriff alerted residents of Arabi Park, Pamela Park, St. Claude Heights, Carolyn Park, Buccaneer Villa, and Chalmette Vista (all large subdivisions). Residents were requested to evacuate their homes and go to shelters. This was done as a precautionary measure because of the loss of life when a levee broke and the area was flooded during Hurricane Betsy in 1965.

Most of the subdivision residents took shelter in schools, industrial plants, and with relatives and friends. The St. Bernard chapter of the American Red Cross housed 6,700 refugees in its 8 shelters at the peak of the evacuation.

Late that same morning most Chalmette residents began leaving shelters to return to their homes and assess damages. All hurricane shelters in St. Bernard Parish were closed by Tuesday morning.

Orleans Parish

All evacuation centers in Orleans Parish were opened at noon on Sunday, August 17. By 6 p.m. on Sunday, evacuation of residents from unprotected areas around Irish Bayou, Rigolets, and Chef Menteur had been completed.



Photograph by Terry Friedman

ONE OF THE FEW EMERGENCIES IN NEW ORLEANS OCCURRED SEVERAL HOURS AFTER CAMILLE HAD BYPASSED THE CITY. PART OF THE PROTECTIVE WORKS ON THE INNER HARBOR NAVIGATION CANAL GAVE WAY WITHOUT WARNING, FLOODING A DENSELY POPULATED RESIDENTIAL AREA



Courtesy of U. S. Navy Department

YOUNG AND OLD WAITED NOT KNOWING WHAT EFFECT CAMILLE WOULD HAVE ON THEIR LIVES

At 8:15 p.m. Sunday, the Mayor of New Orleans recommended that the Lake Vista and Lake Terrace subdivisions on the lakefront be evacuated. Two police buses, the coroner's ambulance, public transit buses, police units, and volunteers using their own vehicles aided in the evacuation. After all who desired to leave had done so, the streets in the subdivisions were closed to traffic. Many residents in these areas, however, remained in their homes.

The Mayor also recommended evacuation on both sides of the London Avenue Canal up to Elysian Fields Avenue as a purely precautionary measure. In addition, two police buses were sent to Venetian Isles to evacuate anyone who desired to leave that area.

At about 2 a.m. Monday, water was reported flowing through the protective systems on both sides of the IHNC in the Florida Avenue-St. Claude Avenue reach. Evacuation was started at once. The overtopping of the downtown (east) side of the canal was quickly contained and

the floodwaters were pumped out of the area by the Florida Avenue pumping station before any significant flooding could occur. On the west side, however, the flow of water into the city streets adjacent to the canal was not completely stopped until 6 a.m.

Five police buses, 15 public transit buses, 38 Louisiana National Guard trucks, and a fire department small-boat fleet were used to evacuate the areas on both sides of the canal. Seven shelters were made available for evacuees of this area.

All evacuees from the protected areas of Orleans Parish were able to return to their homes on Monday, August 18.

St. Tammany Parish

Prehurricane preparation was started by the St. Tammany Sheriff's office on Friday, August 15, as auxiliary equipment, such as generators, radios, and boats were made



THE YOUNGEST OF CAMILLE'S VICTIMS, SUBDUED AND A BIT UNEASY, COULD NOT UNDERSTAND THE REAL MEANING OF THIS NIGHT IN A RED CROSS SHELTER

ready for use. The next day, Sheriff's Department personnel were put on 24-hour standby, and auxiliary police, mounted posse, and the Sheriff's flotilla were called into action.

On Sunday morning, August 17, a prehurricane planning meeting was held in Slidell with representatives of Civil Defense, mayors, and police chiefs in attendance. After the meeting, parish residents were warned to seek high ground and to utilize schools designated as storm shelters.

Warnings of the storm's threat were issued by operators of patrol cars and radio and television stations. Residents of Madisonville, Mandeville, North Shore, and other low-lying areas were warned to evacuate. Approximately 5,000 St. Tammany residents occupied storm shelters during passage of the hurricane.

Jefferson Parish

On Sunday, August 17, all public shelters were opened in Jefferson Parish.

By that afternoon, following the evacuation of some 2,200 persons, Louisiana Highway 1 to Grand Isle was closed from Leeville south. The highway was not, however, overtopped during the hurricane. Evacuated residents were able to return to their homes the following morning.

Lafourche Parish

Red Cross shelters were opened in Larose, Lockport, Raceland, and Thibodaux. The lower part of Lafourche Parish was evacuated beginning at 11 o'clock Sunday morning and it is estimated that about 11,000 people moved out of the low-lying areas. This rep-

resented about 70 percent of the people who live below the Gulf Intracoastal Waterway and 30 percent who reside in the area from Lockport to Larose. Evacuees arrived at various shelters by nightfall on Sunday and returned to their homes on Monday morning.

Terrebonne Parish

Some 5,500 persons from the lower communities of Montegut, Chauvin, Dulac, and Cocodrie evacuated to Houma during the daylight hours Sunday, August 17, and returned to their homes Monday morning.

St. Mary Parish

Sunday morning about 2,000 people evacuated Morgan City, Franklin, Charenton, and low-lying areas in St. Mary Parish. This evacuation was on a voluntary basis with most evacuees returning home Monday morning. Evacuees from this area generally go to Opelousas, Lafayette, or Eunice.

Iberia Parish

Evacuation in this parish was on a voluntary basis. Approximately 400 people left Weeks Island, Avery Island, and low-lying areas. Evacuees started leaving Saturday evening and returned home Sunday evening and Monday morning.

Vermilion Parish

No evacuation was ordered in this parish and very few people left except in the low-lying areas along the Cheniers near Pecan Island where 300 people left. The Sheriff's office was on standby if more

extensive evacuation was ordered.

Cameron Parish

Approximately 1,500 people evacuated from Cameron, Holly

Beach, and other low-lying areas. Evacuation was on a voluntary basis but the Sheriff's office was on standby. Most evacuees in this area went to Lake Charles and returned home Sunday evening and Monday morning.



Courtesy Slidell-Saint Tammany Times

STRICT PATROLLING OF DEVASTATED AREAS WAS NECESSARY FOR MANY DAYS AFTER CAMILLE

Section IV

EMERGENCY OPERATIONS



SECTION IV EMERGENCY OPERATIONS

When a hurricane or other natural disaster impends, a largely ad hoc organization of Federal, State, and local institutions, many with day-to-day missions apparently unrelated to disaster relief and recovery, moves into action. As soon as Camille's existence became known, parts of this organization began to function. After the hurricane had come ashore, the Office of Emergency Preparedness (OEP) took over the coordination of all Federal efforts in the disaster areas. At the peak of activity, no fewer than 20 Federal agencies and 100 State and local agencies were operating in Louisiana, performing a myriad of tasks ranging from draining flooded areas to providing mobile trailers to serve as temporary residences for families whose homes had been destroyed.

NEW ORLEANS DISTRICT (NOD)

First notification of the birth of the tropical storm which was to become Hurricane Camille was received by the District at 2 p.m. Thursday, August 14, via the District's Environmental Science Services Administration (ESSA) "weatherwire." Because the possibility existed that the storm could reach the Louisiana coastline during the weekend, the Operations Division, New Orleans District (NOD), initiated precautionary and preparatory measures on Friday, August 15. By 4 p.m. Friday most of these measures had been completed. As the storm continued its northwesterly course through Saturday, August 16, the District Engineer conducted planning conferences with key staff members while maintaining surveillance and a state of readiness.

On Sunday morning, August 17, it became apparent that the storm would strike land somewhere in the vicinity of southeastern Louisiana or southwestern Mississippi. All remaining measures of readiness were put into effect by the District Engineer; a hurricane watch was established at 12 noon of that same

day and the New Orleans District Emergency Operations Center (NOD EOC) was activated. To ensure continuous electric service in the event of a commercial power failure, all emergency generators at NOD headquarters were tested and found to be in proper operating condition. A continuous radio watch was established, and a special portable radio unit was set up to provide a backup system to assure uninterrupted communications with the Corps of Engineers liaison officer at the New Orleans Civil Defense EOC.

It also became necessary to take precautionary measures at a Jefferson Parish pumping station that was under construction on the south shore of Lake Pontchartrain. Prior to the hurricane season the Pontchartrain Levee Board, under the supervision of the Corps of Engineers and the Louisiana State Department of Public Works, constructed an emergency levee lake-side of the station to provide protection against high tides. On Sunday morning the pumping station discharge basin area was flooded landward of the construction

cofferdam to reduce the effects of head differentials from possible rising tides.

At 3 p.m. Sunday, field units began making hourly reports to the NOD EOC furnishing weather information and river and stream gage heights in the affected areas in the District. These reports continued throughout the storm period, with all data being recorded, evaluated, and sent to the District elements concerned.

By late Sunday afternoon, all practicable precautions to protect Government plant and property had been taken. Continuous radio communication was maintained with the EOC's of other agencies, NOD field installations, and floating plant. An emergency crew remained on duty at NOD headquarters throughout the storm to operate the EOC, maintain communication facilities, and perform emergency repair work.

Liaison with local officials and Civil Defense agencies was established and maintained throughout the period of the emergency. The NOD EOC provided the city of New Orleans Civil Defense EOC with hourly Mississippi River and Lake Pontchartrain gage readings in order to assist Civil Defense officials in evaluating possible flood threats from those sources.

Anticipating the need for helicopters to perform poststorm aerial inspections to ascertain the extent of damages and plan recovery activities, the NOD made request through the Division Engineer to Headquarters, 4th U. S. Army, for three of these aircraft. They arrived for duty in the NOD during the afternoon of Monday, August 18.

Damage reports after the hurricane indicated that the protective measures taken on Government plant and equipment were largely effective. There were no deaths or injuries among Government personnel and only light damage to Gov-

ernment property was sustained. The Dredge Langfitt went aground near the Head of Passes while the survey boats W-29 and Balize suffered minor damages at their respective Venice and Fort Jackson mooring sites. The Venice sub-office and boat pen incurred moderate damage as had the Langfitt's riverside wharf at Venice. Several vehicles assigned to survey parties in the lower Plaquemines Parish area were extensively damaged by floodwaters.

During the early morning hours of Monday, August 18, a staff meeting was called by the District Engineer, NOD, to organize recovery operations and apprise all district elements of mission requirements based on the fragmentary data then available. At the same time, NOD hired labor crews and equipment were mobilized to commence clearing debris and performing emergency repairs to the main line Mississippi River levee to provide access to the lower end of the devastated area in Plaquemines Parish. On the same morning members of the Corps Parish Assistance Teams reported to the NOD Disaster Recovery Center (DRC), which before passage of the storm had been designated as the EOC. These teams were furnished field administration kits, cameras, and radio-equipped vehicles and were instructed to initiate damage surveys in all parishes affected by the hurricane. Eight inspection teams, each led by an engineer, established liaison with local officials, performed damage inspections, photographed damage scenes, and relayed damage reports. These surveys were concerned with determining the geographical limits, nature, and magnitude of damages and not monetary evaluations of the losses. This action was taken in anticipation that the affected areas would be declared major disaster areas and

become eligible for Federal recovery assistance under Public Law 875 (PL 875) as well as for the documentation of the hurricane data in several reports as authorized by ER 500-1-1.

Because of the complete devastation on the Mississippi Gulf Coast and the resulting inaccessibility of the western portion of the Mobile District by their damage survey teams, the Mobile District on Tuesday, August 19, requested assistance from the NOD. NOD teams were promptly dispatched to survey the entire damage area in Mississippi as far east as Biloxi. Gathered information was radioed to the NOD DRC and then relayed to the Mobile District. Comprehensive reports were also prepared by the NOD survey teams and furnished to the Mobile District for their records. On the same day, at the request of OEP and with the concurrence of the Mobile District, the NOD agreed to handle the anticipated work under PL 875 in that portion of the Mobile District located in Louisiana. This action simplified the Federal assistance procedures with respect to the location of OEP region and state boundaries. NOD Parish Assistance Teams were immediately ordered into those portions of St. Tammany and Washington Parishes.

Other Corps survey teams were dispatched immediately following the storm, to evaluate monetary damages to Corps facilities as well as the dollar losses that occurred in the flooded areas within the NOD. A detailed discussion of these surveys is included in Section V, "Collection of Storm Data."

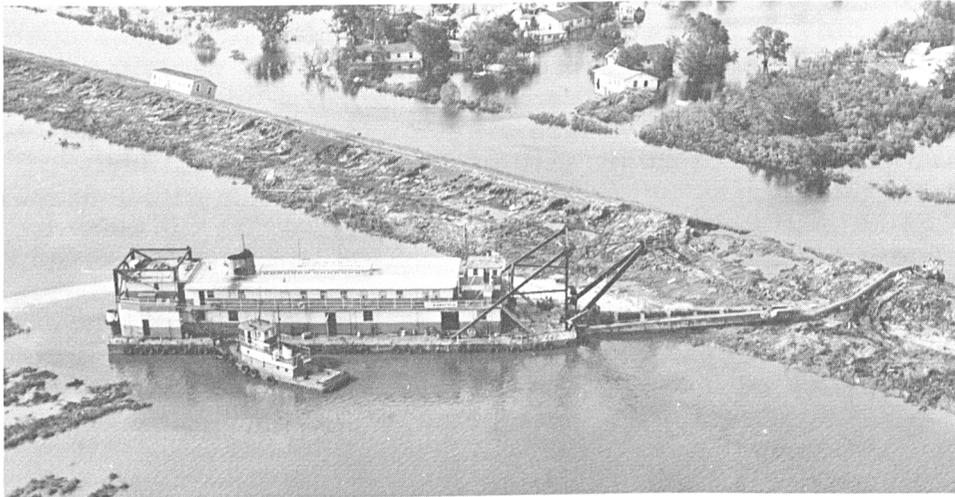
On August 19, the President of the United States designated the five Louisiana Parishes of Plaquemines, St. Bernard, Orleans (Ward 9), St. Tammany,

and Washington as disaster areas and pledged all possible Federal assistance. Upon this declaration the OEP was given the authority to coordinate the relief and rehabilitation activities of all Federal agencies and the affected parishes became eligible for Federal financial assistance under PL 875. As a result of this delegated authority, OEP issued on that day its Request No. 1 which called for the NOD to perform major disaster assistance in Plaquemines Parish consisting of (a) clearing all disaster-generated debris from public roads and streets, (b) accomplishing essential emergency repairs and temporary replacement of public-owned dikes, levees, and drainage facilities, and (c) accomplishing necessary dewatering of flooded areas affecting public health and safety. OEP also issued on August 19, Request No. 2 which called for the NOD to perform major disaster assistance in the Parishes of Plaquemines, St. Bernard, St. Tammany, Washington, and Ward 9 of Orleans. This work consisted of (a) making initial engineering inspections of debris clearance requirements from public and private property that presented a threat to public health and/or safety, (b) making initial engineering inspections of hurricane damages and protective work to public-owned dikes, levees, groins, jetties, and irrigation and drainage facilities, and (c) preparing written comprehensive reports and detailed estimate of the cost for emergency work in (a) and (b).

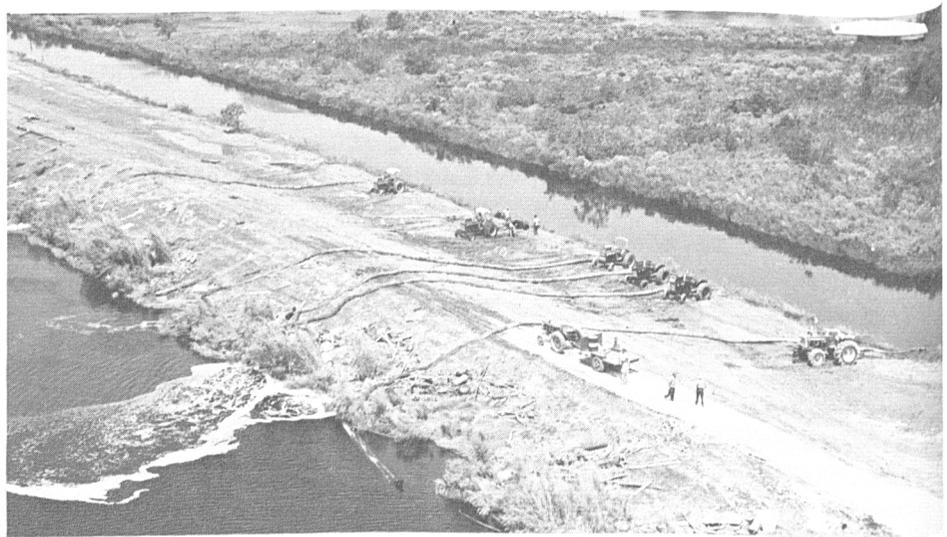
In compliance with the first OEP request, the following actions were taken by the NOD:

- a. Corps personnel utilized contract equipment and made emergency closures of the hurricane protection

AFTER THE HURRICANE HAD PASSED, MUCH OF PLAQUEMINES PARISH ON THE WEST BANK BELOW PORT SULPHUR REMAINED FLOODED. WITH THE NORMAL DRAINAGE PUMPING STATIONS RENDERED INOPERATIVE BY THE STORM, STANDING FLOODWATERS WERE REMOVED BY A VARIETY OF EQUIPMENT, INCLUDING...



HYDRAULIC DREDGES



AND PORTABLE TRACTOR-POWERED PUMPS

back levees so as to facilitate the removal of ponded floodwaters. Dewatering operations began on August 19 by utilizing permanent pumping stations (where operable), leased hydraulic dredges, booster pump barges, and portable pumps. By September 3 all water levels had been lowered to where they were within the banks of the drainage canals and by September 6 all flood removal operations were completed. Cost of the dewatering operations totaled \$245,000.

- b. Debris clearance was begun by means of five Corps contracts that covered operations during the period of August 28 through November 26, 1969. A total of some 555,000 tons of debris was removed at a cost of \$2,016,000. In conjunction with the debris clearance, seven house-moving contracts were let to remove salvable houses that were blocking public rights-of-way and/or creating health and safety hazards. As of February 28, a total of 377 houses was moved back to their original locations at a cost of about \$400,000; only two houses remain out of place.
- c. Parish-owned water supply reservoirs that had been contaminated by the hurricane floodwaters were pumped out by Corps flood-fight pumps.

At the height of the disaster recovery activities a peak total of 275 Corps personnel was directly engaged in disaster recovery oper-

ations, including 32 employees from other Corps Districts.

In compliance with the second OEP request, Damage Assessment Teams were formed to make field inspections and prepare engineering estimates of damages in the five parishes listed above. These teams were comprised of personnel who had previously been members of the Parish Assistance Teams and additional personnel necessary to accomplish the mission. The damage surveys included estimated OEP costs for debris clearance, for protective, health, and sanitation measures, as well as for restoring dikes, levees, and drainage facilities. Upon completion of the initial reports, Corps teams made interim inspections to report on work progress and verify compliance with OEP requirements. Final inspections and reports were completed for all parishes except Plaquemines by January 31, 1970. Completion of the final inspections and reports in that parish is pending conclusion of the work and documentation of costs by parish officials.

Upon the recommendation by the Federal Water Pollution Control Administration to OEP, Supplement 1 to OEP Request No. 1 was issued on September 25 requesting the NOD to remove oil spill in lower Plaquemines Parish that was creating a health and safety hazard. This work was arranged through negotiations with the debris clearance contractor who provided the necessary personnel and pumping equipment to eliminate the hazard. Total cost of this work was \$17,300.

In addition to performing the aforementioned emergency repairs on the Mississippi River levee and the work for the OEP under PL 875, the Corps has either completed or has under way various work of a rehabilitative nature. A discussion of these projects is included in Section VIII, "Rehabilitation."

ACTIVITY OF OTHER AGENCIES

As previously stated, the OEP was authorized to coordinate, through the state and local government, the work of the Federal agencies involved in rescue and rehabilitation activities in the disaster areas. In Louisiana, these areas included the parishes of Plaquemines, St. Bernard, Orleans (Ward 9), St. Tammany, and Washington. OEP established a field office at the NOD headquarters to coordinate the activities for these parishes. Under PL 875, Federal financial assistance is made available for protective work and other work for the preservation of life and property, debris and wreckage clearance, emergency repairs and temporary replacements of essential public facilities of state and local governments, and provisions for temporary housing or emergency shelter. Total OEP expenditures in Louisiana under PL 875 are expected to reach about \$13 million. Additional work coordinated by OEP under PL 79 is discussed in Section VIII, "Rehabilitation."

Continuous, up-to-date reports regarding the location, progress, and nature of the hurricane were made by the U. S. Weather Bureau (Department of Commerce) throughout the storm crisis. Timely information furnished by the Bureau assisted in the orderly preparations for property protection and evacuations of the coastal region of Louisiana. Nearly all of the meteorological data in this report were provided by that agency

Approximately 48 hours in advance of the storm, the Louisiana National Guard emergency operations headquarters began an around-the-clock alert. On August 16, when the residents of portions of Plaquemines Parish were ordered to evacuate, 10 amphibious "ducks" loaded

with 2,000 cots and 4,000 blankets were dispatched from the National Guard supply center at Camp Beauvoir to Jackson Barracks in New Orleans. As of midnight on that same date 323 officers and men were placed on active duty and ordered to mobilize all vehicles and equipment. Mobile communications vans and operators from the Air National Guard at Hammond, Louisiana, were ordered to New Orleans.

After an aerial inspection of the devastated area in Plaquemines Parish had been made on August 18, the engineers and military police at Jackson Barracks were dispatched to Port Sulphur with amphibious "ducks" (including cots and blankets), boats, bulldozers, dump-trucks, front loaders, fuel and water trailers, radio communications, personal weapons and equipment, and emergency rations. The National Guard then began clearing the debris-ridden highway, searching for survivors, posting guards, manning roadblocks, patrolling the area and transporting personnel and supplies through the flooded area. For a 10-day period they continued their operations in the Port Sulphur to Venice area. The National Guard also provided a force of 150 men for 2 days in Bogalusa, Louisiana, where they performed traffic control and guard duties.

The Department of Defense participated in rescue and relief activities both prior and subsequent to the storm. The U. S. Army, Air Force, Navy, and Marine Corps responded promptly, fully, and effectively to the variety of tasks imposed upon them. These included airlift operations, protection of property in storm-torn areas, and use of service equipment and personnel for evacuation and rehabilitation operations.

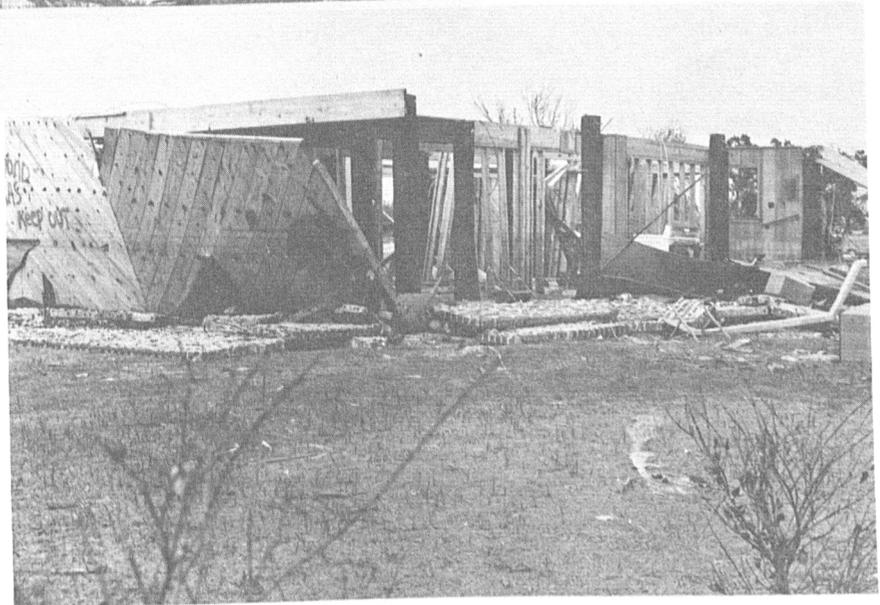
Prehurricane activities of the

Boothville-Venice area



Sunrise

Boothville-Venice area



MAN'S BEST EFFORTS, STEEL-FRAME BUILDINGS AND STURDY BRICK HOUSES, WERE NO MATCH FOR CAMILLE

U. S. Coast Guard (Department of Transportation) included the evacuating of its personnel and securing of Government equipment, rebroadcasting all hurricane advisories, flying over isolated camps and warning occupants, and transferring aircraft from Texas bases to fields in Louisiana to ensure prompt availability when needed. Posthurricane activities included the deployment of 14 helicopters and 2 twin-engine amphibians, and several cutters for patrol of the distressed areas between Morgan City, Louisiana, and Mobile, Alabama. Approximately 55 people were rescued from positions of imminent peril, 140 persons were transferred to medical centers, and 39 distressed vessels were given direct assistance.

The Department of Health, Education, and Welfare was ready to provide necessary assistance in the event of any hurricane-caused jeopardy to public health. Regional offices were instructed to provide supplies from Public Health Service (PHS) medical stockpiles from the Surplus Property Program for emergency use. The PHS Hospital in New Orleans served as a shelter for a number of families, as well as provided medical assistance needed by the evacuees. The U. S. Department of Agriculture (USDA) deployed teams in the disaster areas to administer food and food-stamp programs to sustain refugees. Government-owned food furnished by the USDA was also prepared at shelters throughout the state where the hurricane had posed possible threats. Various relief agencies distributed this food in approximately 137 centers located in 15 Louisiana parishes. Immediately after the passage of Camille, the Agricultural Stabilization and Conservation Service (ASCS) personnel visited the affected areas and appraised agricultural damages. As a result of these damage in-

spectations, ASCS local committees granted seasonal grazing and haying privileges in 14 Louisiana parishes. Hay and Commodity Credit Corporation-owned feed grains were donated in Plaquemines Parish to feed stranded livestock. Emergency funds in the amount of \$200,000 were made available to rehabilitate farmlands and replace damaged conservation structures in four Louisiana parishes.

Technical assistance, as required was provided by the U. S. Maritime Administration to assist local officials in returning port operations in New Orleans and vicinity to normal. Supplies from their marine warehouses were donated to relief agencies to be distributed to disaster victims in Plaquemines Parish.

The Office of Civil Defense (OCD) assisted the U. S. Weather Bureau in disseminating the continuing severe weather warnings to state and local Civil Defense organizations. This was facilitated through the use of OCD's national warning system, which is a 24-hour-a-day dedicated telephone warning network. Prehurricane activities of the state and local Civil Defense agencies included alerting all personnel, securing emergency rations and supplies, and checking out radio equipment to ensure continuous communication capability. During the hurricane, all agencies attempted to coordinate their efforts through OCD to ensure the safety and well-being of all residents. After the hurricane, the Civil Defense centers continued to function, providing communication links for directing and coordinating clean-up and rehabilitation efforts.

By the time Camille neared the Gulf coast, the Red Cross Hurricane Action plan, which was geared to ESSA Weather Bureau forecasts, had been activated. Red Cross disaster staff and equipment were deployed to strategic locations, shelters were established, and

hundreds of volunteers in local chapters were mobilized to house and feed the evacuees. This organization was declared the official disaster relief agency for the State of Louisiana by the Governor. More than 100,000 people spent the night of August 17 in Red Cross shelters in the area extending from New Orleans to Pensacola.

Despite the incredible destruction and communications problems, swift Red Cross, Civil Defense, State, and local relief effort began immediately following the storm. Coordinated by the OEP, Federal agencies worked with the Red Cross by providing food, supplies, and equipment. Total estimated Red Cross expenditures in Louisiana, including rehabilitation efforts that are discussed in Section VIII, were approximately \$3 million as of

March 1970. Considerable additional relief work for the storm victims was contributed by the Salvation Army and various religious, charitable, and civic organizations.

Once again, the utility companies performed an outstanding job in restoration and repair work. Immediately following the passage of the storm, maintenance crews were dispatched into the disaster areas to provide emergency service wherever possible.

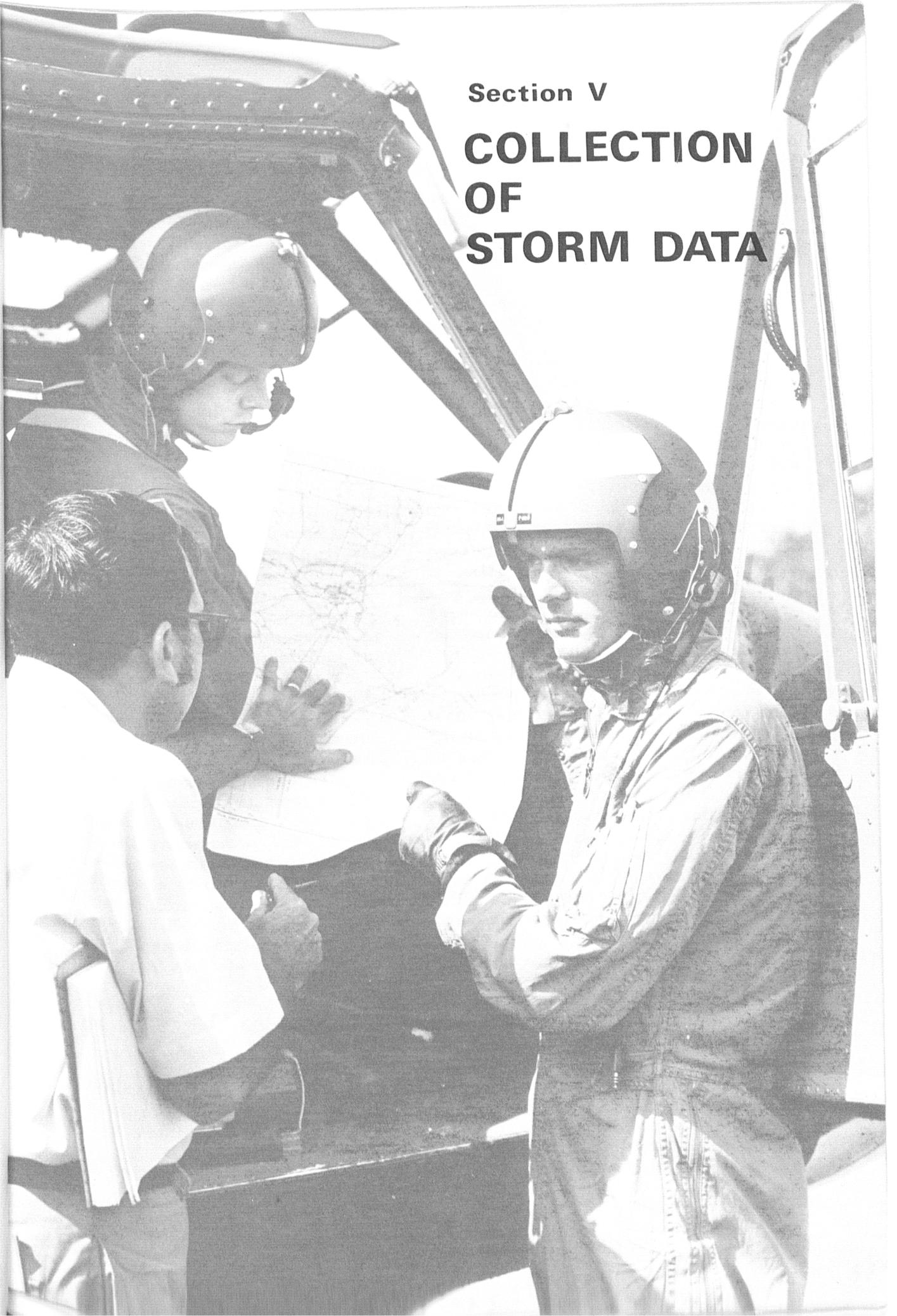
Many other Federal, State, and local agencies responded promptly and effectively to request for assistance in the various relief efforts. A complete listing of all credits due to all the individuals, groups, agencies, and institutions involved in relief efforts is beyond the scope of this report.



CAMILLE'S DEVASTATION LAUNCHED A MASSIVE CLEANUP—MORE THAN 1,300,000 TONS OF DEBRIS WERE REMOVED IN MISSISSIPPI AND ALABAMA

Section V

**COLLECTION
OF
STORM DATA**



SECTION V COLLECTION OF STORM DATA

Teams for engineering inspection and damage evaluation were formed promptly following the hurricane, and by noon on the day after the hurricane came ashore, the teams were in the field. Comprehensive hydrologic and damage surveys were made throughout the affected areas (Plate 1).

GENERAL

On August 18, within 12 hours after the storm made landfall on the Mississippi coast, eight Corps Parish Assistance Teams were dispatched into the disaster areas to make initial damage surveys. This action was taken in anticipation that these areas would be declared major disaster areas and made eligible for Federal recovery assistance under PL 875. On the following day, four additional assistance teams were formed at the request of the Mobile District and dispatched to damaged areas located in that portion of Louisiana which falls within the boundaries of the Mobile District. Details of the operations of these Parish Assistance Teams and subsequent Damage Assessment Teams are contained in Section IV, "Emergency Operations."

At the same time that the Damage Assessment Teams were entering areas of major damage, 10 experienced flood-damage estimators from the Economics Section of the New Orleans District (NOD) were moving into areas where the flood-

waters had already receded; their mission was to estimate and compile for this publication all economic losses that resulted in the overflow area of the NOD. Within a week, this group of flood-damage estimators was expanded to 14 when four additional estimators arrived on temporary duty from the Memphis District. A systematic damage survey of all flooded areas within the boundaries of the NOD was made, with personnel moving from areas of lighter damage to the more heavily damaged areas as cleanup and recovery work in such areas made firm damage estimating practicable. Close coordination between all Corps of Engineers damage teams was maintained throughout the period to prevent duplication of efforts.

Operating concurrently with the flood-damage estimators were four hydrology survey teams comprising a total of 10 men from the NOD. Other personnel from the NOD conducted various engineering surveys and inspections of damages to Corps projects.

COLLECTION OF HYDROLOGIC DATA

Hydrology teams were dispatched into the field on the basis of priorities which considered accessibility of the area, urgency of need for data in the area, and the effect on

the overall efficiency of the data-collection operation. Efforts were first directed to the collection of recording tidal gage charts plus the location and identification of high-water



Venice

Courtesy of Pivach Agency, Inc.



Triumph

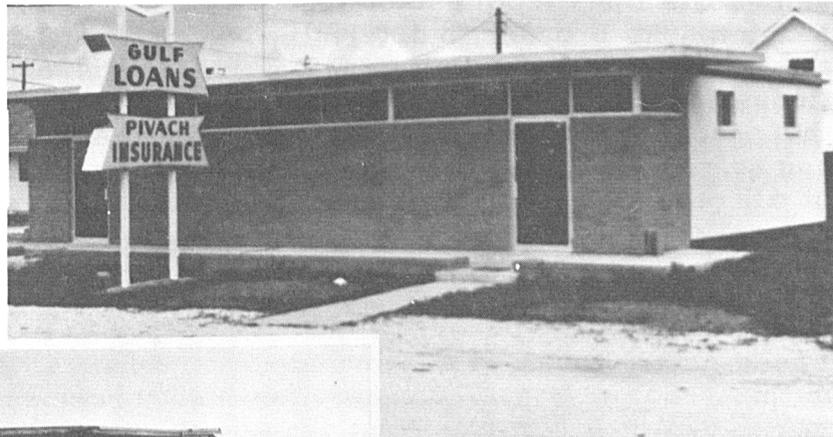
Courtesy of Pivach Agency, Inc.



"BEFORE" AND "AFTER" SHOTS ILLUSTRATE THE DIFFICULTIES IN ASSESSING DAMAGES IN SOME AREAS HIT BY CAMILLE

BELOW GULFTOWN, COMPLETE DESTRUCTION WAS THE RULE, AS EVIDENCED BY ...

THIS OFFICE BUILDING
AT TRIUMPH AND...



Courtesy of Pivach Agency, Inc.



THIS RESIDENCE AT
BOOTHVILLE



marks and debris lines. Levels were run to all high-water marks and debris lines from established bench marks in order to determine the flood elevations. Full descriptions of the high-water marks and their locations have been recorded and are on file in the NOD. Records of all recording tide gages and stream gages operated by the Corps, the U. S. Geological Survey, and industries in the area were obtained and reference datums verified. These flood elevations are included in this report. Miscellaneous information on tides, waves, winds, bar-

ometric pressure, and rainfall was also obtained from other sources.

Accuracy of the hydrologic data within the area of overflow is of high order as the most experienced available personnel collected and evaluated these data. Officials of State and local governments, industries, and business enterprises provided valuable information. Newspaper articles were helpful in describing poststorm conditions. Local citizens also gave their assistance. Information from these sources was valuable in documenting the effects of the storm.

COLLECTION OF DAMAGE DATA

Estimates were made of physical damages sustained by all types of real and personal properties, as well as economic losses to business establishments. Losses to fish and wildlife as well as those occurring in the agricultural sector were also estimated. Damage evaluations were made, where conditions permitted, by appraisals in the field and personal interviews with residents, business owners, industry officials, and representatives of other governmental agencies. In the devastated areas of Plaquemines Parish damage estimates were based on the latest prestorm aerial photographs, tax assessment and building permit data, Dun & Bradstreet, Inc.,

reports, data from public utilities, and fragmentary remains left in the area.

Petroleum industry losses were determined by contact with the major producers in the area and information furnished by the Commissioner of Conservation for the State of Louisiana. Marine losses were derived through contact with insurance underwriters, marina operators, local boat owners, and estimates made in the field. Various secular and religious organizations concerned with relief activities, as well as the Federal, State, and local agencies involved in the emergency operations were contacted in order to determine their losses.

COLLECTION OF ENGINEERING DATA

Data were gathered by visual inspection, by both aerial and ground photography, and by topographic and hydrographic survey methods. Early damage inspections of the devastated areas were made by means of helicopters. Scour and

shoaling conditions in navigable waterways were investigated and conditions of shoreline erosion were noted. Inspection of non-Federal structures was performed by personnel of the NOD at the request of local authorities.

IN A CAPRICIOUS MOOD, CAMILLE LEFT THIS CHURCH STRUCTURALLY INTACT BUT STRIPPED OF ITS VENEER OF BRICKS



Courtesy of Pivach Agency, Inc.





Section VI

SUMMARY OF STORM DATA - METEOROLOGIC AND HYDROLOGIC

SECTION VI SUMMARY OF STORM DATA—METEOROLOGIC AND HYDROLOGIC

The passage of Camille was, for southeastern Louisiana, marked by extreme winds, record-breaking tides, and, in general, moderate rainfall. Nearly all information on barometric pressures, winds, rainfall, and temperatures accompanying Camille was extracted from U. S. Weather Bureau publications. Tidal data was compiled from records of the Corps of Engineers, the Louisiana Department of Public Works, and private industry, while salinity information was extracted from Corps records.

GENERAL

Information presented in this section includes data relating to the meteorological and hydrological phenomena associated with the

storm. Exhibits 10 through 45 present data relative to barometric pressures, winds, rainfall, temperature, tides, and salinity.

METEOROLOGICAL AND HYDROLOGICAL DATA

Barometric Pressures

Early Sunday afternoon, August 17, when Camille was about 140 miles southeast of New Orleans, an Air Force reconnaissance plane flew into the hurricane and its crew reported a central pressure of 26.61 inches of mercury. This pressure is second only to the Labor Day hurricane of 1935, which developed a central pressure of 26.35 inches, the lowest recorded in the western hemisphere.

About 15 miles west of the hurricane's path, at Garden Island Bay Power Plant in Louisiana, a pressure of 27.80 inches was recorded as the storm's eye skirted the mouth of the Mississippi River. As the hurricane moved inland about 11:30 p.m. Sunday, a resident living a few blocks from the west end of the Bay St. Louis Bridge observed a minimum pressure of 26.85 inches, the lowest land pressure recorded. 27.90 inches was recorded at St. Stanislaus School in Bay St. Louis.

The Mississippi Test Facility,

National Aeronautics and Space Administration (NASA), near Picayune, about 25 miles inland, recorded 28.06 inches at 12:15 a.m. on Monday. At Bogalusa, 15 miles west of the path and about 50 miles inland, the minimum recorded pressure was 28.63 inches. At Purvis, about 60 miles from the coast, the minimum pressure was 29.40 inches.

The lowest pressure recorded at Biloxi, which is on the coast about 25 miles east of the landfall point, was 28.94 inches. Minimum barometric pressures observed at various locations along with times of observation are shown in Exhibit 10. Continuous recordings of barometric pressures at specific locations are presented in Exhibits 12 through 21.

Winds

At about 1:15 p.m. Sunday afternoon, August 17, an Air Force hurricane tracking team flew into the storm and estimated top winds

ALL ACROSS A FAMILIAR LANDSCAPE ...



A DOUBLE TWIST OF FATE—
BOTH HOUSE AND CAR DAMAGED

A CHURCH ROOF BEREFT
OF ITS BUILDING AND
ASKEW ON THE LEVEE
CROWN



HOME AND ORNAMENTAL
TREES OVERWHELMED



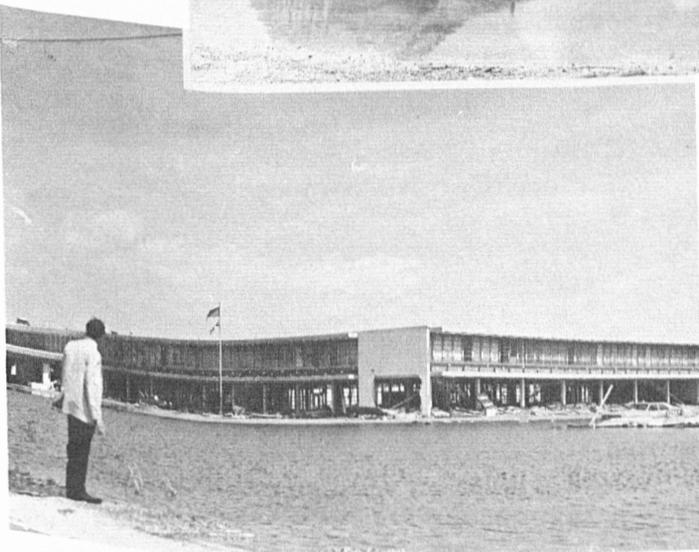
STRANGE SIGHTS MET THE EYE

THE USELESS FACADE OF A BUILDING WHICH NO LONGER EXISTS



THE PEACEFUL REFLECTION
IN TRANQUIL WATERS BE-
LYING THE EVIDENCE OF
NATURE'S RECENT FURY

Photograph by Delaune



A SCHOOL ISOLATED BY FLOODWATERS,
ITS TATTERED FLAG STILL FLYING

at 190 miles per hour (mph) near the center.

Later data based on Weather Bureau calculations indicated that winds were as high as 201.5 mph. The eye of the storm was then located about 140 miles southeast of New Orleans and 35 miles south-southeast of the mouth of the of the Mississippi River. As the center of the hurricane moved just east of the mouth of the Mississippi, hurricane force winds extended out about 40 miles to the west over the southeastern Louisiana land mass.

The highest winds actually recorded were on a drilling rig (Block 92—Main Pass) located about 15 miles east of the hurricane's path. A recorder was switched to double scale before evacuation of the rig. After recording an extreme gust of 172 mph, the paper jammed and the trace was lost.

Winds of 160 mph were estimated by the *SS Cristobal* at Pilot-town. At Boothville, before power failure, the Weather Bureau office recorded gusts of 107 mph at 7 p.m. Sunday.

In the New Orleans area, winds ranged from 40 to 60 mph with gusts to 85 mph. However, the Lakefront Airport recorded sustained winds of 87 mph and gusts of 109 mph. At Slidell, the maximum sustained winds were estimated at 125 mph with peak gusts to 160 mph.

As the hurricane moved in on the Mississippi Gulf Coast about 11:30 p.m., most recording instruments were disabled or destroyed. At Bay St. Louis an anemometer recorded 140 mph before the wind bent the support. Sustained winds in excess of 100 mph with gusts from 150 to 175 mph were estimated by an Air National Guard Weather Flight stationed at the Gulfport Municipal Airport. Other estimates from the Gulfport-Bay St. Louis area indicated winds ranged from 150 to 200 mph.

Keesler Air Force Base at

Biloxi recorded winds of 81 mph with gusts to 129 mph. Ingall's Shipyard at Pascagoula had sustained winds of 81 mph and a local radio station reported winds of 104 mph before power failure.

The Mississippi Test Facility (NASA) estimated sustained winds of 120 to 140 mph and gusts to 160 mph. When the eye of the storm reached the latitude of Jackson, Mississippi, winds were below hurricane intensity. At Jackson, gusts of 67 mph were reported around 7 o'clock Monday morning.

Camille's wind field is shown in Plate 3. Highest winds, peak gusts, and continuous recordings of wind velocities for various locations are shown in Exhibits 10, 12, 13, 15, and 17-19.

Rainfall

A narrow belt of heavy rains, between 5 and 10 inches, spread inland with Camille. From 2 to 6 inches of rain occurred in extreme southeast Louisiana, central and northern Mississippi, and northwest Florida.

From southeast Louisiana to Jackson, Mississippi, average precipitation was about 5 inches within the area 20 miles west and 80 miles east of the hurricane path. Two rainfall extremes were reported in Mississippi. The Mississippi Test Facility (NASA) had 10.06 inches of rain and Hattiesburg had 10.60 inches of rain.

Camille weakened after moving inland and was a tropical depression before reaching the northern border of Mississippi. Crossing Tennessee, she produced heavy rains.

On Tuesday, the depression turned eastward through Kentucky and into the Appalachians. Rainfall in Kentucky ranged from 2 to 3 inches in a broad band extending



CAMILLE PRODUCED TORRENTIAL RAINS AND MASSIVE MUDSLIDES WHICH OVERWHELMED AREAS OF SOUTHEASTERN WEST VIRGINIA AND CENTRAL VIRGINIA WITH BEWILDERING SWIFTNES



Photograph by Delaune

STANDING WATER COMPOUNDED THE MISERIES OF SEARCHING THROUGH WRECKAGE AND CLEANING UP DEBRIS

from the south-central to the north-eastern part of the state.

The remnants of Camille produced torrential rains over the Appalachians, causing flash flooding in southeastern West Virginia and in central Virginia. In Virginia up to 27 inches of rainfall caused the most severe flooding in nearly a century along the James River and its tributaries. The greater part of this rain fell within an 8-hour period late Tuesday night and early Wednesday morning. Storm rainfall for locations in Louisiana, Mississippi, and Alabama are shown in Exhibit 10 and in Plate 4.

Temperature

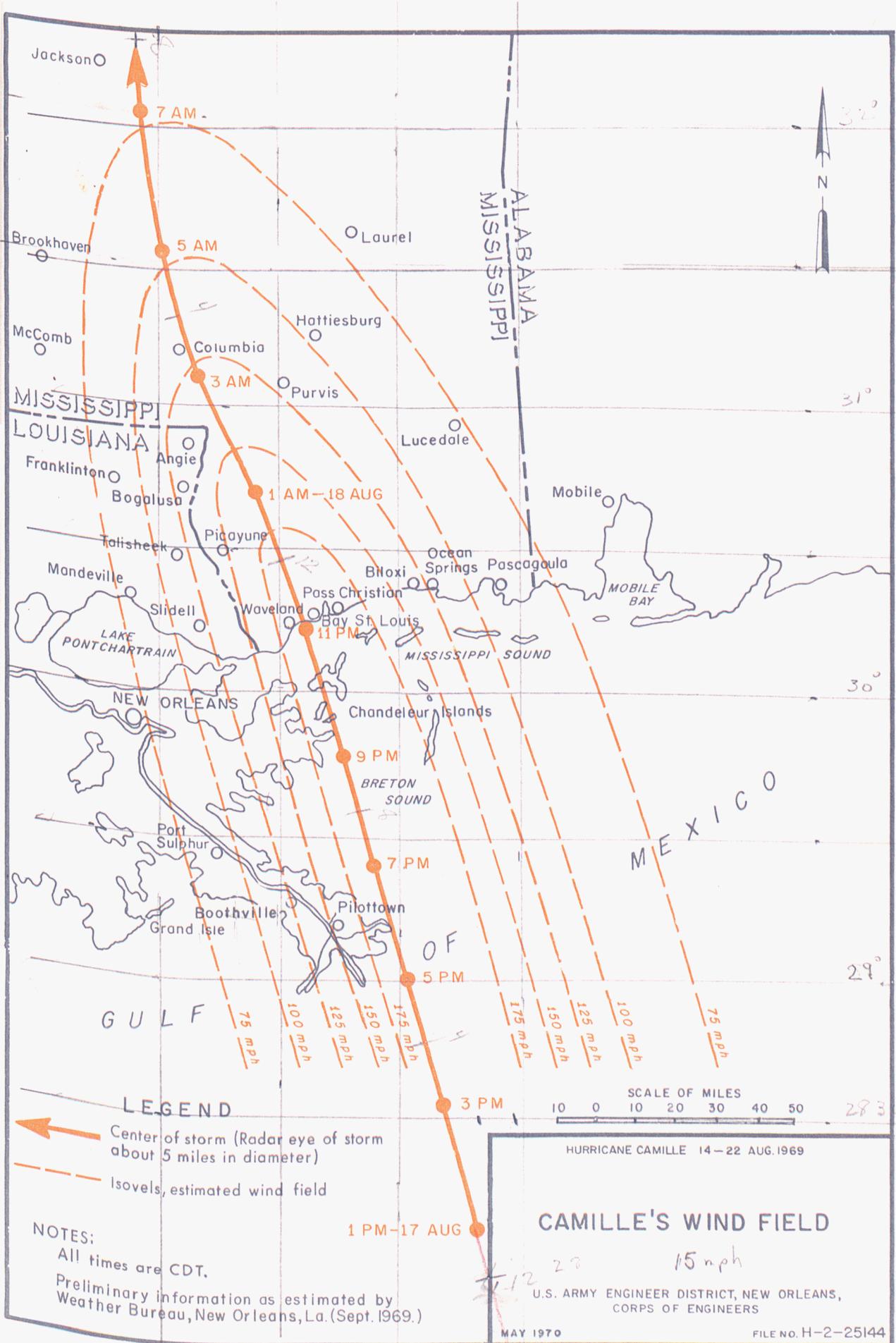
Temperatures before and after Hurricane Camille ranged from 1 to 4 degrees above the normal for the month of August. However, during the actual storm period, most loca-

tions in or adjacent to the hurricane's path experienced a lowering of 9 to 13 degrees in the daily maximum temperature. Temperature data are shown in Exhibit 11.

Tides

The extreme intensity of the storm and the course that it followed, as it skirted the Louisiana marshlands east of the Mississippi River and moved inland on the Mississippi Gulf Coast, combined to produce enormous tidal surges in the lower delta areas of Plaquemines Parish and along the entire Mississippi Gulf Coast.

The primary thrust of the hurricane surge, possibly the greatest ever produced in the Gulf of Mexico, occurred just east of the eye as the storm approached the shore and moved inland near the Waveland-Bay St. Louis area.



Jackson

7 AM

Brookhaven

5 AM

Laurel

McComb

Hattiesburg

Columbia

Purvis

MISSISSIPPI
LOUISIANA

Lucedale

Franklinton

Angie

Bogalusa

1 AM - 18 AUG

Mobile

Talisheek

Pidayune

Biloxi

Ocean Springs

Pascagoula

MOBILE BAY

Mandeville

Slidell

Waveland

Pass Christian

MISSISSIPPI SOUND

LAKE PONTCHARTRAIN

NEW ORLEANS

Chandeleur Islands

Port Sulphur

9 PM

BRETON SOUND

MEXICO

Boothville

7 PM

Pilottown

OF

5 PM

GULF

75 mph

100 mph

125 mph

150 mph

175 mph

175 mph

150 mph

125 mph

100 mph

75 mph

LEGEND

Center of storm (Radar eye of storm about 5 miles in diameter)

Isovels, estimated wind field

NOTES:

All times are CDT.

Preliminary information as estimated by Weather Bureau, New Orleans, La. (Sept. 1969.)

SCALE OF MILES
10 0 10 20 30 40 50

HURRICANE CAMILLE 14-22 AUG. 1969

CAMILLE'S WIND FIELD

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

PLATE 3

90°

89°30'

89°

88°30'

32°

31°

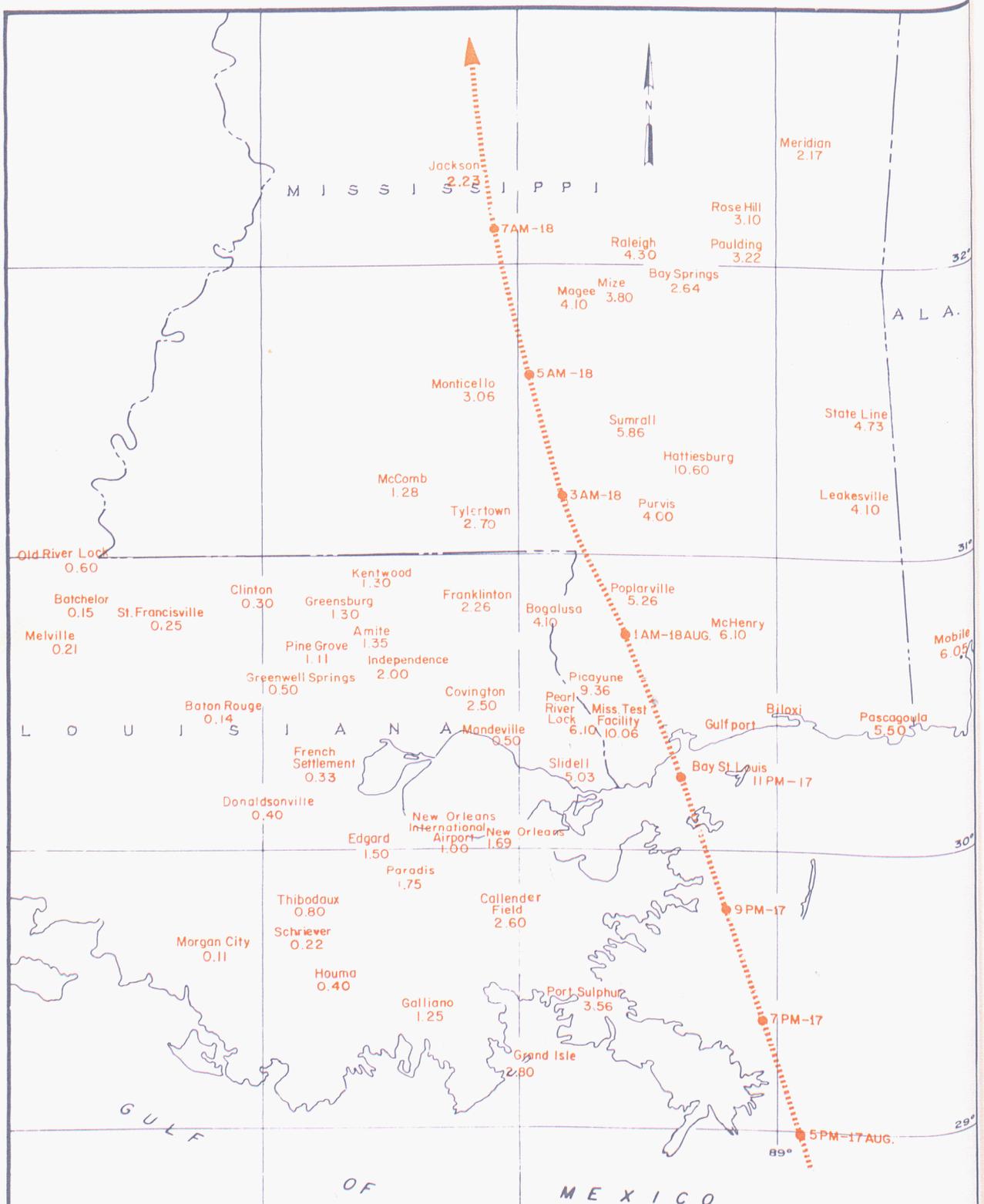
30°

29°

28°30'

28
12

15 mph



HURRICANE CAMILLE 14-22 AUG 1969

RAINFALL

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO H-2-25144

SCALE IN MILES
10 5 0 10 20 30

9C

LEGEND

Path of hurricane

10.06
Cumulative rainfall, in inches
32 hour period
17 & 18 Aug. 1969

NOTES:
Compiled from U.S. Weather Bureau data.
The times shown refer to Central Daylight Saving Time.
Decimal point indicates town location.

Tides ran about 15 to 22 feet above normal and possibly higher just east of the storm's center. Camille produced tides 3 to 5 feet above normal as far east as Apalachicola, Florida.

Tides just west of the center ranged from about 10 to 15 feet above normal but fell off sharply running only 3 to 4 feet above normal west of the Mississippi River. On Grand Isle, west of the river and about 60 miles off the hurricane track, the maximum tide was 3.6 feet.

All-time tide height records were broken from Waveland, Mississippi, eastward to at least Biloxi, Mississippi, and westward to Clermont Harbor, Mississippi, and on into Lake Borgne in Louisiana as far west as the Rigolets entrance. Hurricane surge heights of 20 feet and over occurred on the Mississippi coast from Bay St. Louis eastward to Gulfport (about 20 miles), and heights of 18 feet or more were experienced as far east as Biloxi and as far west as Waveland.

A still high-water mark of 22.6 feet, measured inside the Veterans of Foreign Wars Clubhouse at Pass Christian, Mississippi, was the maximum reliable hurricane surge height documented for the storm. Less reliable high-water elevations taken from debris marks in the vicinity were recorded at 24.6 and 24.2 feet. Still high-water marks of 15.5 feet were recorded for the Armory at Biloxi, Mississippi, and inside a residence on East Howard Avenue, in the vicinity of the gage on Old Highway 90 Bridge which crosses Biloxi Bay. The gage was destroyed by the storm and its record was not recovered.

Tidal elevations in lower Plaquemines Parish, Louisiana, approached 16 feet. High-water marks of 15.9 feet were recorded on the west bank of the Mississippi River levee near Venice and on the east

bank river levee near Ostrica.

On the east bank of the Mississippi River in the vicinity of Bohemia and Pointe a la Hache, tides rose against the back protection levee as well as the river levee but failed to overtop or breach either. Along the back protection levee water elevations were 11.0 feet near Bohemia and 6.8 feet behind Pointe a la Hache.

The areas around Delacroix were heavily damaged in 1965 by Hurricane Betsy but were spared from flooding by Camille. Tides reached 8.0 feet at Alluvial City, and 8.9 feet at Hopedale. Along the Mississippi River-Gulf Outlet (MR-GO) tides rose to 11.1 feet at Bayou Yscloskey and 9.7 feet near Paris Road Bridge.

As the hurricane surge swept over the east bank of the Mississippi River levee a rapid influx of tidal waters interrupted normal river flows and elevated stages for a considerable distance upstream. A surge profile for the Mississippi River is presented in Plate 5. The stage near Pointe a la Hache was 11.8 feet. Maximum stages at Chalmette and New Orleans were 11.3 feet and 10.8 feet, respectively.

In the Inner Harbor Navigation Canal (IHNC) the hurricane surge produced a stage of 10.2 feet at the canal side of the Industrial Canal Lock and 8.6 feet at the Louisville and Nashville Railroad Bridge. At Seabrook Bridge, the maximum water surface elevation was 6.5 feet.

Salinity

Salt water intrusion from the Gulf of Mexico is a seasonal occurrence within the lower reaches of the Mississippi River. Salt water moves upstream from Mile 0 above Head of Passes (AHP) as the river discharge falls below



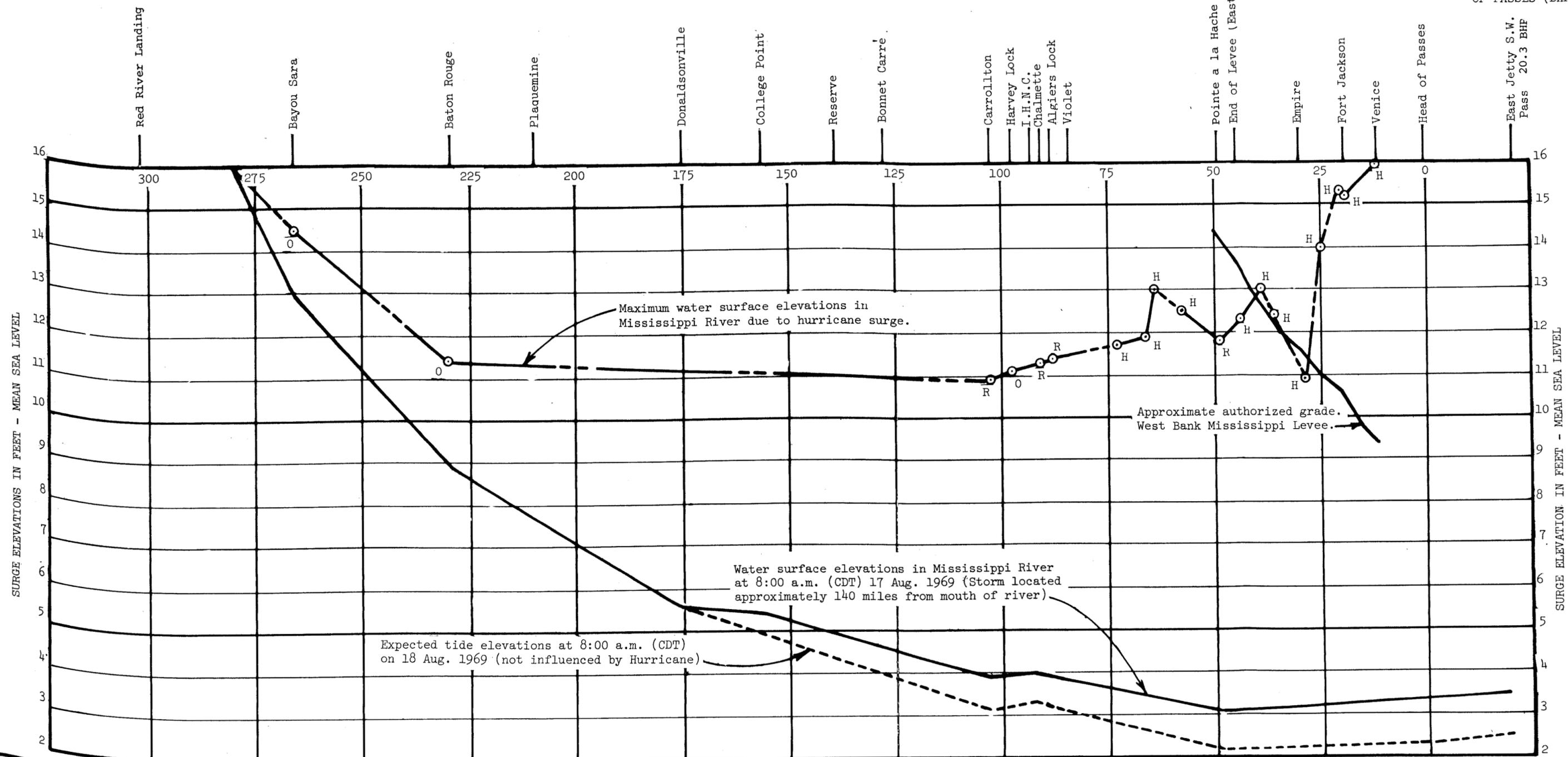
MANY A RESIDENT RETURNED
TO FIND HIS HOME RESTING ON
LEVEE SLOPE OR CROWN ...



THIS BUILDING, HOWEVER, RESTS IN TIDEWATER OUTSIDE THE LEVEE SYSTEM

DISTANCE IN MILES ABOVE HEAD OF PASSES (AHP)

DISTANCE IN MILES BELOW HEAD OF PASSES (BHP)



LEGEND

- O Observed elevation
- R Elevation from recording gage
- H Highwater mark from debris line, structures on west bank

NOTE:

- (1) River surge overtopped levee on West Bank as far upstream as mile 44.8 (AHP)
- (2) Between Venice and Point a la Hache, the actual levee crown elevation was generally 1 foot below the authorized grade.
- (3) Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. & G.S. Levels)

HURRICANE CAMILLE 14-22 AUG 1969

**SURGE ELEVATIONS
IN THE
MISSISSIPPI RIVER**

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO H-2-25144

300,000 cubic feet per second (cfs).

The river discharge during Hurricane Camille was about 260,000 cfs, a flow that normally maintains fresh surface water as far downstream as Venice, Louisiana. Although the hurricane surge caused an influx of salt water, the salinity at the water supply intakes of New Orleans or Port Sulphur did not increase.

Surface water samples taken during the period August 11 to August 25 at Mile 105 AHP at the New Orleans Sewerage and Water Board intake indicated less than 29 parts per million chlorides (ppm Cl^-) and samples taken at Mile 39 AHP by the Freeport Sulphur Company indicated less than 35 ppm Cl^- .

The Mississippi River at New Orleans had pH values ranging from 7.65 on August 12 and 13 to a peak of 7.90 on August 26. The turbidity during the same period decreased from an initial value of 240 to a value of 51 on August 26. There was no apparent change in water

temperatures during this period.

Locations along the eastern Louisiana coast experienced short periods of increased salinity before and during the passage of Camille. Water temperature data taken along the eastern Louisiana coast did not reflect any significant changes during the hurricane period. Salinity data observed during the hurricane period are shown in Exhibit 43.

Conductivity data recorded from August 12 to 19, 1969, in the IHNC at Seabrook Bridge and at the junction of the Gulf Intracoastal Waterway, and the MR-GO near Paris Road are plotted in Exhibit 44. The recorded conductivities at Seabrook Bridge indicate that ebb tide salinities averaged 2,500 ppm Cl^- in the early morning of August 16. As the tidewater inflow began, this value increased until it peaked on August 17 at 5,750 ppm Cl^- at the -5 foot depth and 7,750 ppm Cl^- at the -15 foot depth. At Paris Road, the peak salinity recorded was 10,000 ppm Cl^- .



Courtesy Slidell-Saint Tammany Times

IN THE SLIDELL AREA, CAMILLE'S TREACHEROUS WINDS SNAPPED TREES AS IF THEY WERE BRITTLE STICKS

Section VII

SUMMARY OF STORM DATA— PHYSICAL AND ECONOMIC



SECTION VII
**SUMMARY OF STORM DATA—PHYSICAL
 AND ECONOMIC EFFECTS**

The nature of damages within the area of overflow in the New Orleans District (NOD) ranged from devastating in lower Plaquemines Parish to nominal in some of the other protected areas. Nearly all elements of the region's economy suffered some damage, and the total economic loss within the overflow area covered by this report reached almost \$200 million. Federal projects operated to prevent approximately \$180 million in additional damage.

GENERAL

This section includes general data on areas which were flooded by the hurricane and damages both physical and economic within these areas. The latter part of this section contains data on losses sustained by the petroleum industry, marine and navigational facilities and equipment, fish and wildlife, and flood protection structures. Damages as related to existing and authorized Federal projects are also discussed in this section. Plate 6, Tables 1 through 28, and Exhibits 1 through 9 contain pictorial and graphical interpretations of this information.

Within the NOD, the hurricane flooded more than 900,000 acres, or nearly one quarter of the aggregate land area of the parishes experiencing overflow; total dollar damages therein amounted to nearly \$200 million. Information on population

and land area for parishes experiencing flooding is given on a parish-by-parish basis in Table 1.

Data on flooding and damages are also presented on a parish-wide basis in the following paragraphs.

Estimates of damage are those resulting from the combined effects of tidal overflow, wind, and rain. These damages include the effects of rising water, tidal surges, wave action, direct blasts of hurricane winds, wind-driven rains, and the destructive action of wind and/or water-driven debris.

Damage estimates are divided into 14 major categories. These categories are used either all or in part in Tables 2-26 and 28 which summarize damages by geographical reaches.

The major items of damage included in each of these categories are shown below.

<u>Category</u>	<u>Damage Items</u>
Residential	Private and company-owned homes and apartments.
Mobile Homes	House trailers on permanent or semipermanent foundations.
Commercial	Retail, wholesale, and service business facilities.
Agriculture	Crops, pasture, and livestock.

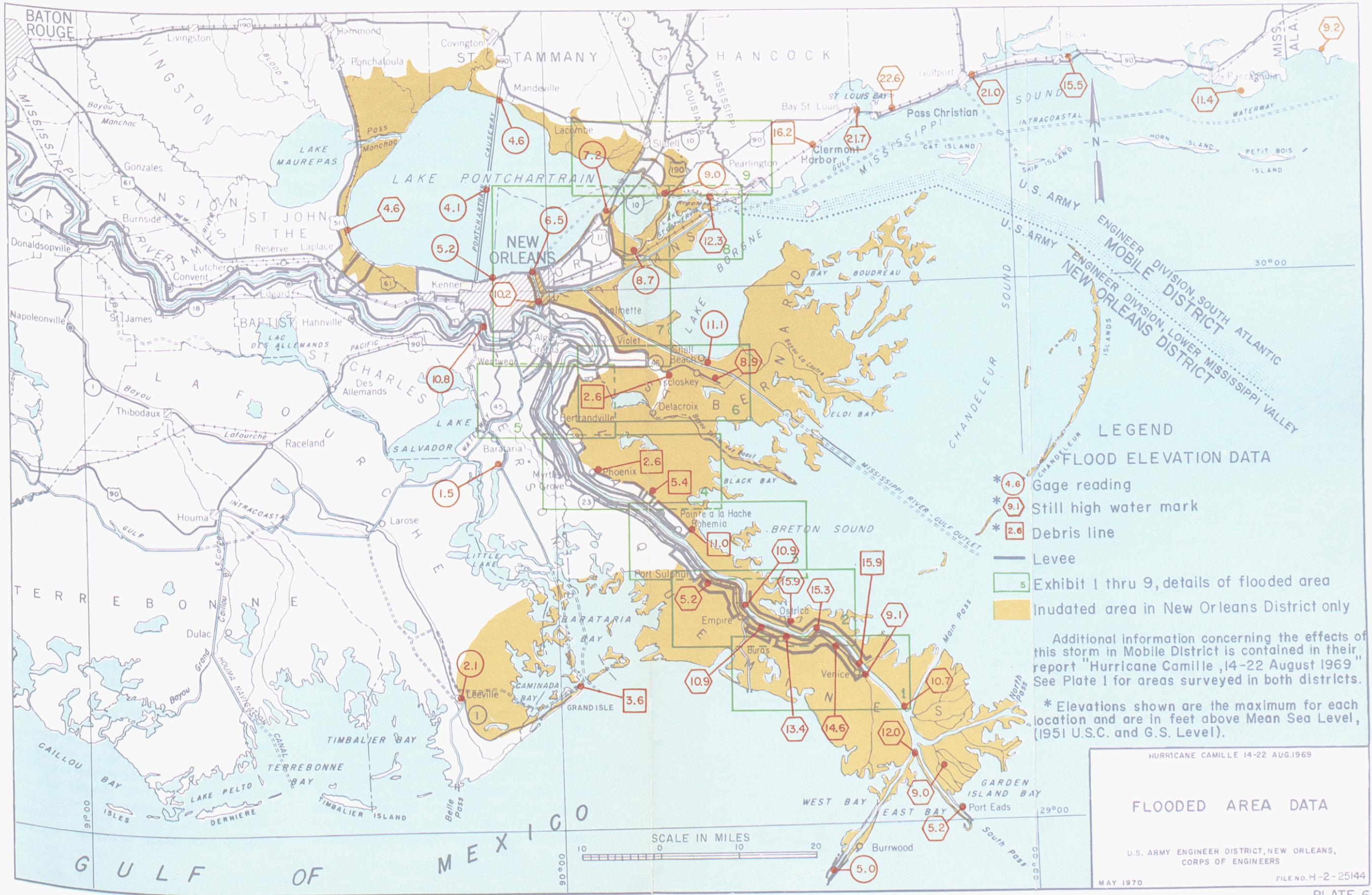
<u>Category</u>	<u>Damage Items</u>
Industrial, Nonpetroleum	All industrial facilities except petroleum.
Industrial, Petroleum	Production platforms, drilling rigs, pipeline ^s storage facilities, office buildings, and other direct supporting oilfield suppliers. Both offshore and onshore facilities are included.
Marine	Vessels, wharves, piers, and handling facilities. Includes salvaging and refloating vessels.
Transportation	Railroad buildings, equipment, and tracks; automobiles, trucks, and buses.
Utilities	Power, telephone, telegraph, and gas companies facilities, water and sewerage districts facilities.
Governmental	Highways, roads and bridges, publicly owned facilities except schools, levee repair, channel restoration, drainage facilities and dewatering operations, navigational aids, debris removal, policing, and health and sanitation protection.
Schools	All public, parochial, and private school facilities including living quarters.
Churches	All church buildings and facilities except schools.
Fish and Wildlife	Oysters, shrimp, finfish, fur-bearing animal ^s , and wild game.
Other Losses	Evacuation and subsistence costs, disaster assistance.

Damages occurring under the above-listed categories have been compiled into three separate classifications: damage to fixed property, damage to movable property, and other losses.

- a. Fixed property consists of generally immovable facilities such as houses, buildings, operating machinery that is bolted into place, levees, roadways, utilities, citrus trees, truck crops, and pasture.
- b. Movable property includes items not considered as per-

manently attached, e.g., household and office furnishings, business supplies, raw materials, automotive vehicles, livestock, and foodstuffs.

- c. The other losses classification is concerned with the economic losses attending reduced business activity, increased business operating expenses, loss of salaries, evacuation costs, extraordinary costs of subsistence, disaster assistance and cleanup expenses, as well as losses not properly assignable to the classifications of either fixed or movable property.



LEGEND

FLOOD ELEVATION DATA

- * 4.6 Gage reading
- * 9.1 Still high water mark
- * 2.6 Debris line
- Levee
- 5 Exhibit 1 thru 9, details of flooded area
- Inundated area in New Orleans District only

Additional information concerning the effects of this storm in Mobile District is contained in their report "Hurricane Camille, 14-22 August 1969" See Plate 1 for areas surveyed in both districts.

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level, (1951 U.S.C. and G.S. Level).

HURRICANE CAMILLE 14-22 AUG. 1969

FLOODED AREA DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144

TABLE 1
AREAS FLOODED BY HURRICANE CAMILLE

Parish	Total Land Area In Parish acres	Estimated Land Area Flooded acres	Total Population of Parish (Estimated 1967) ^a	Estimated Population Within Flooded Area
Jefferson	389,100	10,200	303,100	500
Lafourche	740,500	47,100	63,700	100
Orleans	177,400	41,400	665,000	4,000
Plaquemines	629,800	414,100	27,100	17,800
St. Bernard	326,400	251,800	48,300	2,600
St. Charles	194,600	25,300	26,600	0
St. John the Baptist	144,000	18,400	21,500	0
St. Tammany	581,100	50,400	59,000	2,000
Tangipahoa	513,900	49,400	64,400	0
TOTAL	3,696,800	908,100	1,278,700	27,000

^a Louisiana State University in New Orleans, Statistical Abstract of Louisiana, 1969, p 33-34 (Third Edition).

PLAQUEMINES PARISH

General

Plaquemines Parish occupies a peninsula formed by the Mississippi River as it pushed its delta into the Gulf of Mexico. The entire parish consists of relatively low-lying lands which accreted as a result of successive overflows that occurred before the installation of the Mississippi River levee system.

The area is characterized by narrow alluvial streambanks paralleling the river on each side, and sloping away from the river into low marshy areas. Ground elevations vary from a maximum of approximately 11 feet on the natural alluvial levees at the upper end of the

parish to about -3 feet in developed levee loops where consolidation has occurred as a result of pumped drainage. Ground elevations in the unprotected marshes vary from near sea level to about 2 feet.

Because of the low ground elevations and the hazard of overflow, both riverine and tidal flood protection works are essential to the development of the region. Protection from flooding is provided to developed areas by a combination of river levees and back levees. Together, these form protected closed "loops." Rainfall runoff from within these loops is passed through the back levee by gravity drainage structures on the east bank and over



Photograph by Delaune

FOR SEVERAL DAYS WATER AND DEBRIS BLOCKED ROADS, MAKING IT IMPOSSIBLE FOR MANY PEOPLE IN PLAQUEMINES PARISH TO DISCOVER IF THEIR HOMES WERE STILL STANDING

the back levees by pumping stations on the west bank.

Due to its exposed geographical position, the parish is periodically subjected to storm surges of great intensity which have, on two occasions in the past 4 years, overwhelmed portions of the protective system.

Plaquemines Parish has registered a rapid population growth during recent years largely because of the oil boom: 14,239 (1950), 22,545 (1960), and 27,100 (estimated 1967). The growth from 1960-67 occurred despite the disruptive influence of Hurricane Betsy in 1965.

Practically all of the growth registered since 1950 has been on the west bank of the Mississippi River where over 85 percent of the population resides. Principal communities on the east bank include Braithwaite, Scarsdale, Phoenix, Davant, and Pointe a la Hache (the

parish seat). On the more populous west bank are the more urbanized communities of Belle Chasse, Myrtle Grove, Port Sulphur, Empire, Buras, Triumph, Boothville, and Venice.

Economic activities in the parish include extensive oil and gas production—both onshore and offshore—base facilities for the oil and gas industries, sulphur production, salt production, facilities for commercial and sport fishing, and agricultural production.

Mineral production provides the major economic stimulus for the area. The total value of mineral production for Plaquemines Parish in 1967 was nearly \$913 million, as compared to \$673 million in 1965, and \$472 million in 1962. The increases shown result largely from the vigorous growth of the petroleum industry; over 90 percent of the total stated for 1967 is composed

of oil and gas production.

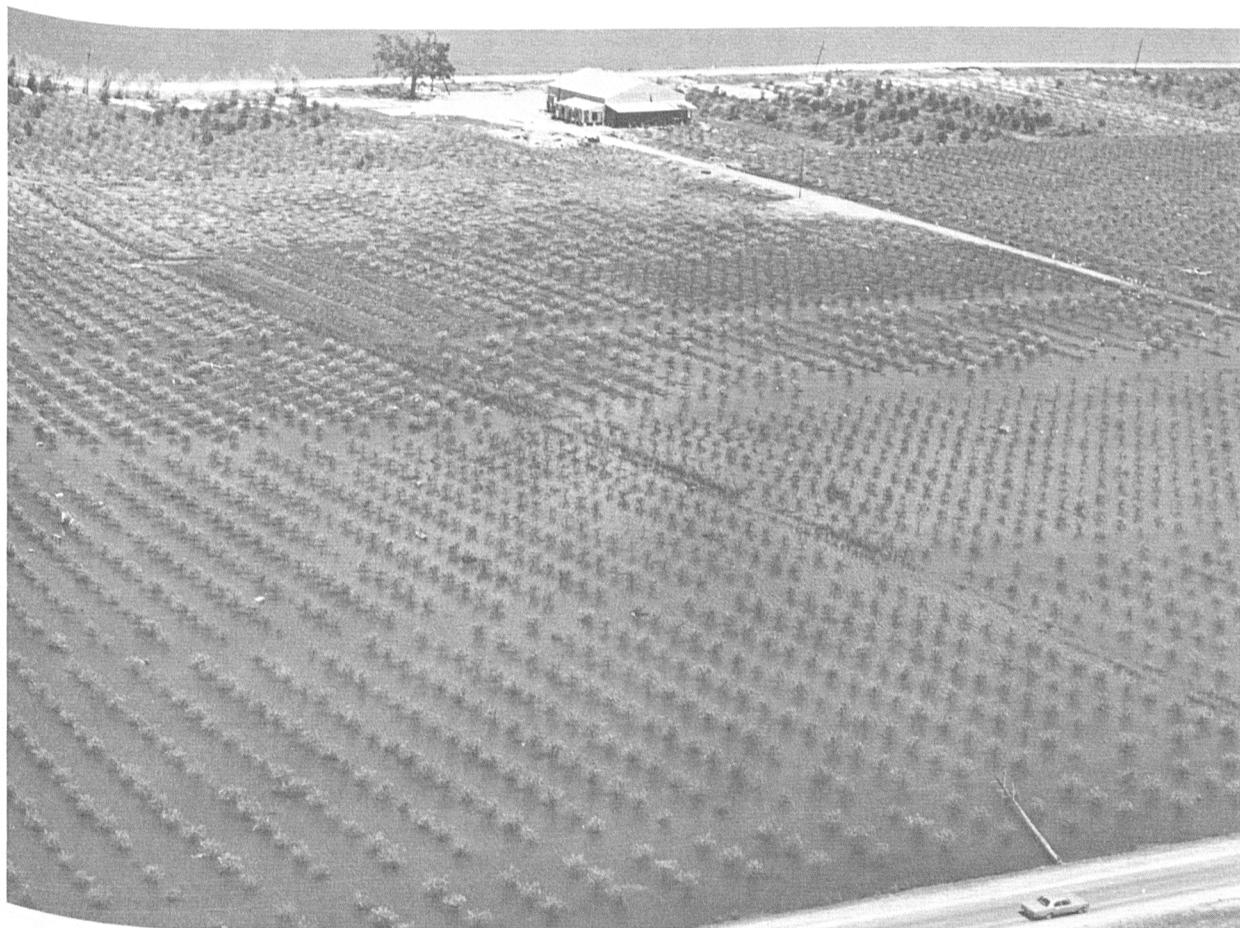
Sulphur is mined at Grande Ecaille in the marsh area to the west of Buras and at Garden Island Bay near the mouth of the river, then transported to facilities at Port Sulphur for processing and shipment. Presently, the production of salt is of minor importance to the economy of the parish. However, the parish is generously endowed with petroleum, gas, and sulphur deposits and abundant production of these commodities is expected to continue.

Fish and wildlife resources in this area are of significant value to the local and State economies. The area is widely known for its high productivity and wide variety of saltwater seafood species. Sport fishing annually attracts thousands

of participants from all over Louisiana and other parts of the country.

Principal commercial fisheries, in order of dollar value, include shrimp, menhaden, oysters, and saltwater finfishes. Two large menhaden plants located at Empire process the catches of that species taken from the Gulf waters. The total value of commercial fishery landings in the parish during 1968 was estimated to be \$4.4 million.

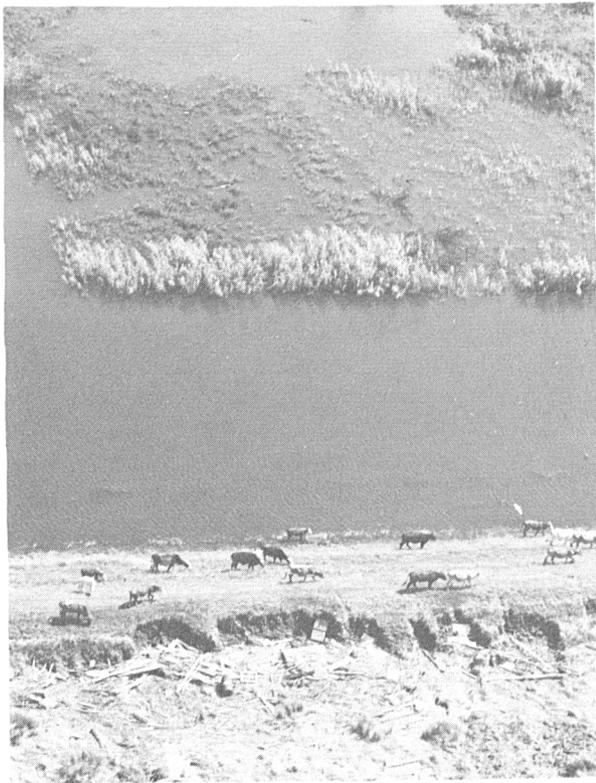
Major agricultural pursuits are truck cropping, the raising of beef cattle on improved pastures and marsh range, and citrus production. In 1964, the total value of all farm products sold in Plaquemines Parish was about \$470,000, as compared to \$1.1 million in 1959 and \$923,000 in 1954. This



DAMAGE TO THE CITRUS INDUSTRY IN PLAQUEMINES PARISH AMOUNTED TO WELL OVER \$2 MILLION

reduction in the value of agricultural output may be attributed in part to the increased urbanization of the area with a resulting decrease in available farmland. Also, farming activities have been abandoned by many in favor of employment in the petroleum industry.

In past years, citrus fruit was the most important agricultural commodity in the area but damages sustained by the trees during the severe freezes of 1961 and 1962, and during Hurricane Betsy in September 1965, have reduced the economic importance of the citrus industry. Subsequent to Betsy, an attempt was made to revitalize this industry with the planting of some 60,000 trees. The industry has now suffered another severe setback with the passage of Camille. Local growers, however, indicate that a substantial portion of the citrus orchards will be replanted.



CATTLE SOUGHT REFUGE FROM CAMILLE ON THE HIGHEST GROUND AROUND—THE LEVEES

The value of livestock and livestock products sold fluctuates annually from about \$100,000 to \$350,000, depending on growth of herds and cattle prices. Cattle numbers generally vary from 3,000 to 6,000 with about 4,000 being the average head count in the parish.

Acreage devoted to truck cropping is steadily declining; however, the total value of vegetables sold has increased due to higher prices and greater productivity per acre. In 1964, the truck crop production on approximately 2,000 acres was valued at about \$284,000.

Damages—General

Winds generated in the southeast Louisiana area, estimated to be as high as 201.5 miles per hour (mph) drove a tidal surge through Breton Sound and the marshes, overtopping both the east and west bank Mississippi River levees below the latitude of City Price. These floodwaters spread over the protected areas on the west bank, and, as far upstream as Empire, overtopped the back levees as well. Some areas were submerged by as much as 16 feet of water. Above Empire, floodwaters did not overtop the back levees, but accumulated in the protected areas to depths as great as 6 feet. All protected areas on the east bank are located upriver of the point where the river levees were overtopped, and these areas escaped flooding.

The overtopped levees on the east bank of the river suffered near-destruction. The west bank river levee was moderately damaged on its river-side slope, principally by wave action occurring before the levee was overtopped. As the surge overtopped this levee, it severely eroded the land-side slope and moved on to batter the back levee, causing massive erosion and numerous crevasses.



FREQUENTLY HOMES LEFT STANDING WERE SHELLS WITH NOTHING INSIDE ...



OR DAMAGED HULKS BEYOND HOPE OF REPAIR

Failure of the back levee was a mixed blessing. Floodwaters were permitted to recede promptly to normal tide level, but, pending emergency repair, much of the area was left undrainable, and, without more formidable rehabilitation the area would be left vulnerable to overflow from even modest hurricane surges from the west.

Approximately 66 percent of the total land area in the parish or about 414,000 acres was flooded. About 13,500 acres of the flooded area was developed for urban and agricultural use with the rest consisting of woods and marshland. Plate 6 and Exhibits 1-5 show the flooded areas of Plaquemines Parish.

An estimated 17,800 residents of the parish were required to seek refuge in advance of Camille. Lower Buras and the towns of Gulftown, Triumph, Boothville, and Venice, were, for all practical purposes, totally destroyed. Exhibits 50 and 51 present "before" and "after" Camille aerial views of parts of Buras and Boothville.

From Empire to Buras, buildings sustained massive structural damage; from Empire to Venice, all communications, electric power, and highway access were lost. Above Empire, damages were less severe, but significant damage was sustained as far upriver as lower Port Sulphur.

In the reach lying between Port Sulphur and Empire on the west bank, flooding varied from an average of about 1 foot over the floors of residences in Port Sulphur to some 3 to 4 feet over the floors near Empire.

From Empire to Sunrise, flooding was substantially greater, with depths running 8 to 9 feet above floors. Damages in that reach were severe with some buildings being shifted off their foundations.

Overflow from Sunrise to Venice varied up to 16 feet in depth

over ground level. Almost total destruction resulted to buildings and other improvements within the levee loop. Relatively few of the houses remained structurally intact—these few generally floated about and were deposited ultimately in haphazard fashion within the area or on the back levees.

Below Port Sulphur, an estimated 2,450 houses and 1,000 mobile homes were in the overflow area; of these, some 1,800 houses and 900 mobile homes were totally destroyed. About 11,000 persons were left homeless. Over 400 commercial establishments suffered losses, and more than 450 automobiles were damaged. In addition all pumping stations below Empire were rendered inoperative.

Protected areas and unprotected inhabited areas along the east bank of the Mississippi River above Bohemia were not flooded and generally received only modest wind damages. Below Bohemia, scattered camps and the community of Pilottown were severely damaged. Major losses on the east bank below Bohemia included the drowning of many hundreds of cattle and innumerable wildlife.

Extensive damages were suffered by onshore and offshore petroleum industry facilities in the Plaquemines Parish area; of the total losses, it is estimated that over 90 percent occurred in the area lying to the east and southeast of the Mississippi River. On the west bank in the developed area lying immediately below Venice and outside of the protective levee system, floodwaters flowed through the area at an approximate depth of 4 feet over the ground causing moderate damage to oilfield suppliers and residences of oil company personnel. Plate 7, page 114, provides a general portrayal of the effects of Camille on oil industry production facilities along the lower coastal region. A discussion of the



SOME HOMES IN THE STORM-HIT AREA WERE LIFTED OFF THEIR FOUNDATIONS AND DEPOSITED ELSEWHERE ...



OTHERS COLLAPSED WHERE THEY STOOD, AND STILL OTHERS APPEARED TO BE STRUCTURALLY INTACT

petroleum industry losses is contained on page 114.

Considerable damage to the oyster industry resulted from shoaling and other disturbances of the natural ecology of the seed oyster beds in the Breton Sound and Black Bay areas. A more detailed outline of the nature of these losses along with dollar damages sustained is shown on page 120.

Damages to navigation facilities occurred from shoaling near the

entrances of the Mississippi River and Mississippi River-Gulf Outlet (MR-GO). U. S. Coast Guard aids to navigation also suffered extensive loss.

Marine losses were light as compared to those resulting from Hurricane Betsy. Several large ships were grounded along the Mississippi River but none were lost. Major losses reported included one tugboat and approximately one-half dozen barges. Two ferryboats, as

TABLE 2

SUMMARY OF ESTIMATED DAMAGES^a

PLAQUEMINES PARISH

(Damages in Thousands of Dollars)

Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	26,405.0	11,217.0	315.0	37,937.0
Mobile Homes	4,037.0	2,115.0	84.0	6,236.0
Commercial	4,886.0	5,596.0	9,027.0	19,509.0
Agriculture	1,108.0	634.0	1,185.0	2,927.0
Industrial, Nonpetroleum	939.0	564.0	742.0	2,245.0
Industrial, Petroleum	57,250.0	3,710.0	9,440.0	70,400.0
Marine	0.0	1,600.0	1,800.0	3,400.0
Transportation	70.0	392.0	179.0	641.0
Utilities ^b	5,455.0	0.0	2,447.0	7,902.0
Governmental ^b	10,348.0	772.0	4,378.0	15,498.0
Schools	4,439.0	565.0	118.0	5,122.0
Churches	594.0	176.0	0.0	770.0
Fish and Wildlife	0.0	0.0	1,800.0	1,800.0
Other Losses ^b	0.0	0.0	3,491.0	3,491.0
TOTAL DAMAGES	115,531.0	27,341.0	35,006.0	177,878.0

^a In the flooded area only.

^b Data not available for individual reaches.

Note: This table contains losses which were not available by individual reaches; category totals shown above do not in all cases equal summations of the reaches.

well as workboats, pleasure craft, and fishing boats by the dozens were deposited on the west bank river levee below Empire. Some boats were carried completely over the river levee and deposited within the protected area or on the back levee. Damage sustained by these smaller vessels was generally light to moderate.

The total economic damages in the overflowed area of Plaquemines Parish are estimated to have been about \$178 million. Detailed descriptions of damages in the parish, and evaluations of such damages in each relevant category are included in the following paragraphs. Data summarizing the damages are presented in Table 2.

Damages—East Bank Above Bohemia

No significant flooding of the protected areas occurred on the east bank of the Mississippi River. The mainline river levee was, however, subject, for a short time, to wave splash-over from the vicinity of Pointe a la Hache to Bohemia. Although this splash-over resulted in minor ponding for a short period, damages were negligible. Without the protection afforded by the Mississippi River and back levees, the area would have been flooded to depths up to about 9 feet over ground. The moderate rain attending the storm, estimated to have been about 3.5 inches in this area, created no ponding problems within the protected levee loops.

Overflow in the unprotected areas was generally limited to the low-lying marsh areas and the back edges of the alluvial ridges. Wind damages throughout the developed areas along the river were minor. Because of the danger of tidal overflow, it was necessary, as a precautionary measure, to evacuate an es-

timated 3,300 inhabitants from the area. Economic damages in the unprotected area are listed in Table 3. Exhibits 3 through 5 show the areas which were flooded in this reach.

Damages—East Bank Below Bohemia

High tides generated by Camille flowed in a generally westerly direction through Breton Sound, over all of the marshlands, and through the Pointe a la Hache Relief Outlet. Two levees, one between Bayou Lamoque and Ostrica, constructed by the Orleans Levee District, and the other, the Lower Grand Prairie levee, extending from Ostrica to Baptiste Collette Bayou, were overtopped throughout their entire lengths. Both levees were severely damaged and, in fact, the Lower Grand Prairie levee, which was being restored by the Corps of Engineers after being severely damaged during Hurricane Betsy, was practically leveled as a result of the tidal overflow. All marshes and alluvial ridges below Baptiste Collette Bayou were inundated. Plate 6 and Exhibits 1 through 5 illustrate the areas which were flooded in this reach.

Normally the levee embankments, canal spoil banks, and adjacent marsh areas provide grazing for several hundred cattle on the east bank below Bayou Lamoque. During high water, their primary refuge is the levee embankment along the river. While no exact head count of the losses was practicable, it is probable that few of the cattle survived.

The settlement of Pilottown serves as a way station for pilots who guide oceangoing vessels in the Mississippi River and its navigable passes. It is not accessible by land. Some 35 homes and 1 school in this small community were heavily

TABLE 3
ESTIMATED DAMAGES^a—PLAQUEMINES PARISH
UNPROTECTED AREAS

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damage ^b
	\$	\$	\$	\$
Residential	72.8	28.0	9.4	110.2
Commercial	165.6	411.3	926.0	1,502.9
Agriculture	0.0	156.9	0.0	156.9
Industrial, Nonpetroleum	520.0	0.0	0.0	520.0
Industrial, Petroleum	55,350.0	3,710.0	9,440.0	68,500.0
Marine	0.0	1,600.0	1,800.0	3,400.0
Transportation	0.0	13.2	0.0	13.2
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	60.0	10.0	2.0	72.0
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	56,168.4	5,929.4	12,177.4	74,275.2

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

damaged by wind and tidal wave action. All inhabitants had been evacuated to higher ground in advance of the storm.

One segment of the Freeport Sulphur Company's operation includes the mining of sulphur in the Garden Island Bay area near the mouth of the river. Wind and tide damages to production facilities and living accommodations at this installation were heavy.

An estimated 100 inhabitants living below Bohemia in scattered camps and in the community of Pilottown sought refuge on higher ground.

Economic damages for this

area are included in Table 3.

Damages—West Bank Above Port Sulphur

Although there is evidence that the tidal surge overtopped the west bank mainline Mississippi River levee up to Mile 44.8 at City Price, no serious flooding occurred above Port Sulphur. The overtopping, which resulted from wave action, was of insufficient duration to cause any noticeable ponding within the City Price-Port Sulphur levee loop. Exhibit 3 shows the area inundated in this reach.

Damages—West Bank, Port Sulphur to Empire

This entire reach of approximately 3,200 acres of protected land was subjected to inundation, varying from about 3 feet deep over ground near Port Sulphur to 6 feet at Empire. The flooding resulted from substantial overtopping of the main-line river levee, particularly in the lower half of the reach below Nairn. Although the landward slope of the levee was heavily damaged by scour, there was no failure. Damage to the back levee, which was apparently not overtopped, was slight.

At its crest, the floodwaters varied from about 1 foot deep over the floors of homes at the upper end of the area to about 4 feet over the floors near Empire. Relatively few buildings were displaced from their foundations. Flood damages gen-

erally increased from light near Port Sulphur to moderately heavy toward the lower end of the levee loop. Exhibits 2 and 3 depict the flooded areas in this reach.

Floodwaters were removed by August 25 through the continuous operation of the two permanent pumping installations that serve the area and one auxiliary pump. All vehicular traffic, except amphibious vehicles used for patrolling purposes, ceased during most of this period.

Moderate damage was incurred by the New Orleans and Lower Coast Railroad Company, mainly in the form of ballast wash and other road-bed damage. Rail service to Empire was restored in about 6 weeks.

An estimated 2,650 persons were evacuated from this area in anticipation of the storm's arrival.

Improvements damaged in this reach included 514 houses (value



THE AREA AROUND EMPIRE LOCK GENERALLY MARKED THE UPSTREAM LIMIT OF GREATEST DEVASTATION. ABOVE THIS POINT, THE DEGREE OF DAMAGE LESSEned PROGRESSIVELY

TABLE 4
ESTIMATED DAMAGES^a—PLAQUEMINES PARISH
PORT SULPHUR TO EMPIRE

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	631.8	601.7	66.2	1,299.7
Mobile Homes	150.5	171.3	10.1	331.9
Commercial	72.3	94.9	49.8	217.0
Agriculture	145.8	1.0	51.6	198.4
Industrial, Nonpetroleum	50.0	0.0	64.0	114.0
Transportation	20.0	56.2	16.0	92.2
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Churches	6.1	12.0	0.0	18.1
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	1,076.5	937.1	257.7	2,271.3

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

\$8,354,000), 119 mobile homes (value \$771,000), 33 commercial enterprises (value \$1,618,000), 1 industrial plant (value \$26,000,000), 6 churches (value \$330,000), and 46 automobiles (value \$55,000).

Substantial damages were also incurred on 700 acres of citrus crops with losses to orange trees and future production. Information on the major classes of damage that occurred within this reach is contained in Table 4.

Damages—West Bank, Empire to Buras

All of the 900 acres lying within this reach of protected area

were flooded to depths varying from 9 feet above ground near Empire to about 11 feet in the vicinity of Buras^a. Overflow resulted from a general overtopping of the Mississippi River^a levee which, in turn, was subjected to scour activity. The integrity of the levee was not, however, destroyed at any point due to the erosive action.

Within a short period of time, floodwaters filled this levee loop system to the elevation of the back levees, then overtopped these levees^b, and continued flowing to the west over the expansive marsh areas. Overtopping of the back levee caused serious erosion resulting in numerous crevasses and heavy damage^c to this embankment. The flooded



FOURTEEN FEET OF WATER AND A BARGE RENDERED THIS LP&L STATION IN LOWER PLAQUEMINES PARISH POWERLESS. HOWEVER, ELECTRICAL SERVICE WAS QUICKLY RESTORED TO THE AREA

area in this reach is delineated in Exhibit 2.

In the upper one-half of the area, from Empire to Sunrise, floodwaters rose to approximately 8 feet over the floors of homes and businesses. Many of the buildings were shifted off their foundations and moved about, mainly in the vicinity of Empire. Overall damages to buildings were heavy, with loss of contents being essentially complete. Mobile homes and their contents, as well as any vehicles left in the area, were also complete losses.

Two menhaden plants operating in the area suffered substantial damages to their buildings and machinery necessitating the

closing down of operations for a 1- to 2-month period. An oil company installation near Empire also experienced extensive damage.

Below Sunrise, the severity of the damage was even greater, with total losses being sustained by nearly every structure and its contents. Throughout this reach all utilities suffered heavy losses. A 138-foot gasoline barge was swept over the Mississippi River levee by the tidal flow and was partially lodged in the Buras substation of the Louisiana Power and Light Company. Destruction of livestock and citrus orchards was essentially complete. All normal highway traffic throughout the reach was interrupted due to standing water

ALTHOUGH MOST HOMES REMAINED STANDING IN THE AREA FROM EMPIRE TO SUNRISE, SEVERE WINDS AND EAVES-DEEP WATER LEFT EVERYTHING IN SHAMBLES

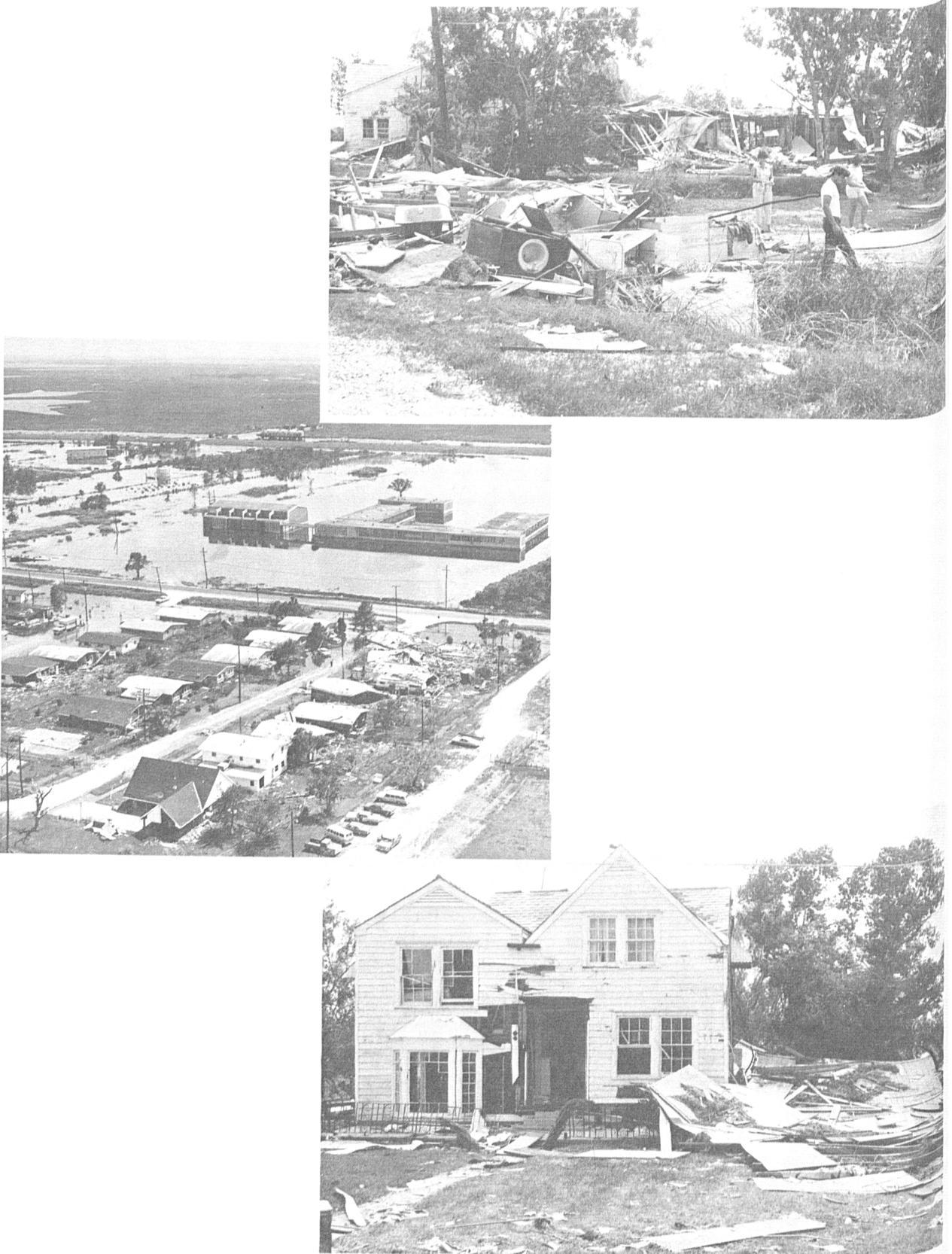


TABLE 5
ESTIMATED DAMAGES^a—PLAQUEMINES PARISH
EMPIRE TO BURAS

Category	(Damages in Thousands of Dollars)			
	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	4,005.2	1,909.7	53.6	5,968.5
Mobile Homes	953.4	476.7	19.5	1,449.6
Commercial	701.7	822.7	1,024.3	2,548.7
Agriculture	67.8	126.3	77.3	271.4
Industrial, Nonpetroleum	369.0	564.0	678.0	1,611.0
Industrial, Petroleum	100.0	0.0	0.0	100.0
Transportation	50.0	131.2	0.0	181.2
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	0.0	100.0	0.0	100.0
Churches	98.0	29.0	0.0	127.0
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	6,345.1	4,159.6	1,852.7	12,357.4

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

and voluminous debris. Storm winds and floodflows overtopping the mainline river levee demolished the New Orleans and Lower Coast Railroad Company depot at Buras and damaged boxcars standing in the area. Extensive ballast wash occurred and sections of track were displaced from the roadbed. The approaches to the railroad drawbridge at the Doullut Canal were also washed out. Rail service to the menhaden plants at Empire was restored near the end of September 1969. Application has been made to the Interstate Commerce

Commission for permission to discontinue service below this point.

Before rehabilitation of the area could begin, it was necessary to make emergency repairs to the back levee, effecting a closed system. Emergency pumping facilities had to be installed, since the permanent station at Sunrise which serves the area was inoperative due to flood damages to its operating machinery. Ten portable pumps varying from 12 to 16 inches in size and two hydraulic dredgeboats having 20- and 24-inch pumps, respectively, were used to begin

removal of the standing water. The Sunrise station was restored to use on August 18 and all floodwaters were removed from the area by August 26.

Approximately 2,700 persons left their homes in the Empire-Buras reach for higher ground in advance of the hurricane.

Improvements damaged in this reach included 419 houses (value \$6,723,000) and 227 mobile homes (value \$1,430,000), 45 commercial establishments (value \$3,363,000), 2 industrial plants (value \$2,805,000), 1 school (value \$1,100,000), 5 churches (value \$180,000), and 106 automobiles (value \$127,000). The major classes of damage in this reach are summarized in Table 5.

Damages—West Bank, Buras to Fort Jackson

There are some 1,850 acres in this reach, all of which were subjected to severe flooding, of varying depths up to 16 feet over ground. Massive tidal overflows completely overwhelmed the protective levee system and fierce winds swept through the area. Buildings were rearranged in random fashion and nearly all were damaged beyond restoration. The floodwaters rapidly filled the levee loop, then overtopped the back levee and flowed to the west through the marsh area. Erosion of the Mississippi River levee occurred over much of its

length and was particularly heavy in the vicinity of Triumph where a crevasse nearly occurred. The back levee was breached in many places and damaged almost throughout its entire length. Exhibits 1 and 2 outline the areas inundated in this reach.

Houses, mobile homes, and automobiles were totally destroyed while commercial establishments, schools, churches, and utilities were severely battered. Citrus trees, truck crops, and livestock were completely lost. Roads and highways were impassable due to the standing water and enormous stacks of debris that remained following the storm.

Since much of the area lies at or below sea level, repairs to the back levee were necessary before the remaining floodwaters could be removed. Auxiliary pumping equipment as previously described was utilized to begin removal of the ponded waters since the permanent pumping installation at Triumph was rendered inoperative due to flood damages. The Triumph pumping station resumed pumping on August 23 and by September 1, the water level had been restored to normal.

An estimated 4,900 persons were evacuated from this reach in advance of the storm.

Within this reach damages were sustained by 850 houses (value \$19,635,000), 313 mobile homes (value \$2,254,000), 178 businesses (value \$5,546,000), 4 schools (value \$4,126,000), 7 churches (value

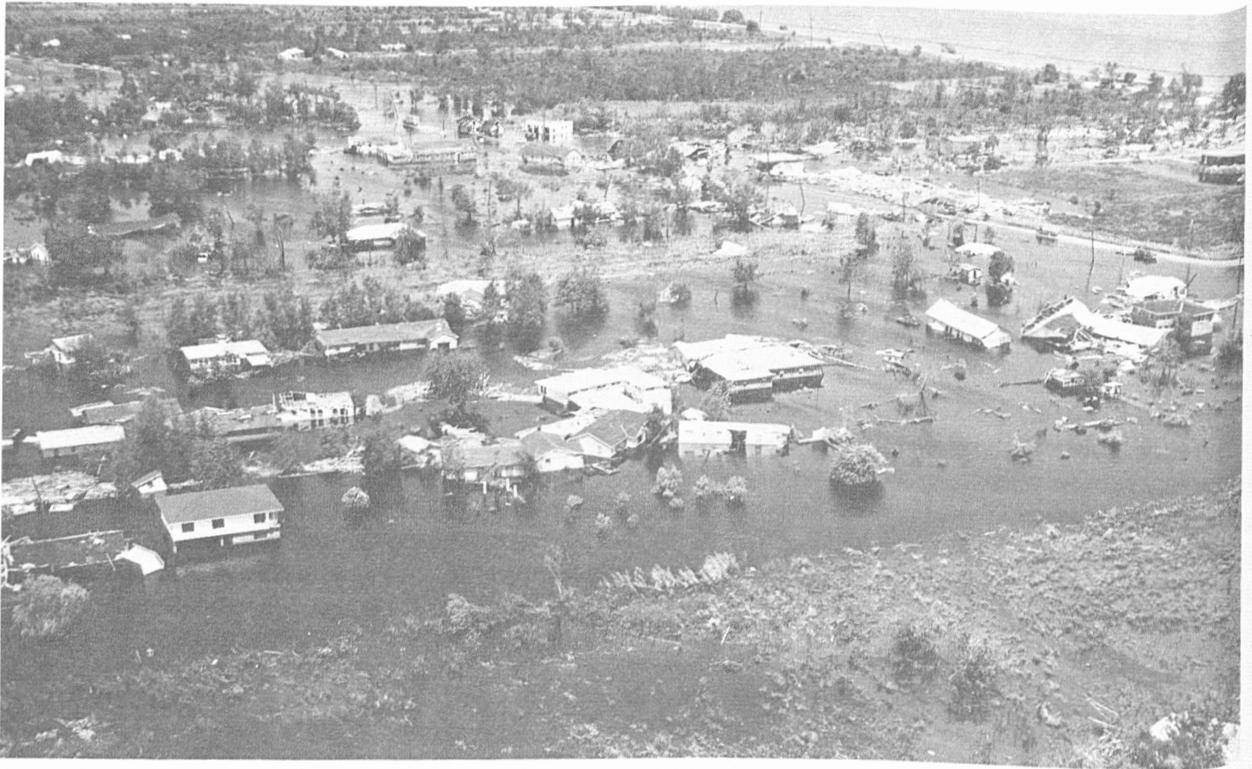


IN MANY PLACES, CAMILLE SO SCATTERED DEBRIS AS TO CREATE AN AURA OF DESOLATE NEATNESS

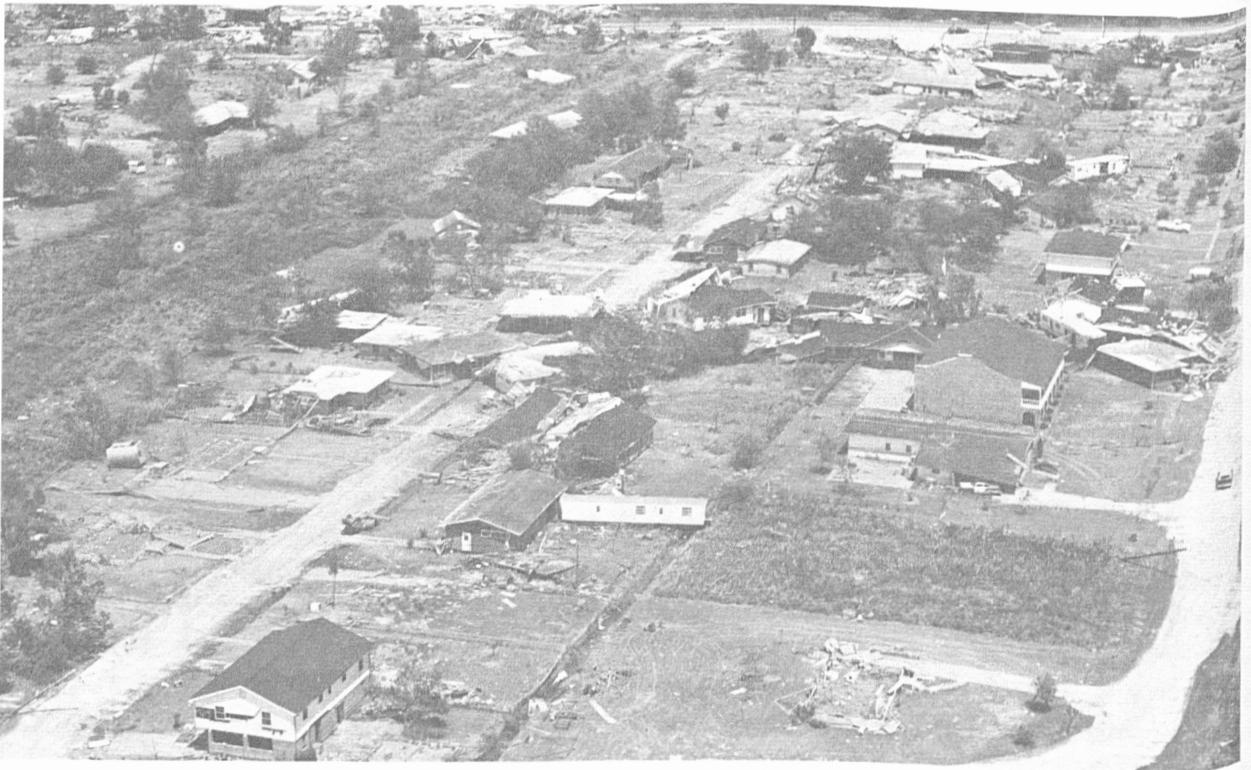


BURAS WAS THE LARGEST OF THE LOUISIANA TOWNS DEVASTATED BY CAMILLE

GULFTOWN



ONE WEEK AFTER CAMILLE ...



A LITTLE OVER TWO WEEKS AFTER CAMILLE

TABLE 6
ESTIMATED DAMAGES^a—PLAQUEMINES PARISH
BURAS TO FORT JACKSON

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	14,025.0	5,610.0	110.2	19,745.2
Mobile Homes	1,502.4	751.2	26.9	2,280.5
Commercial	2,390.3	2,033.3	3,619.3	8,042.9
Agriculture	347.5	255.8	432.0	1,035.3
Transportation	0.0	7.8	162.6	170.4
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	2,302.0	290.0	76.0	2,668.0
Churches	320.0	77.0	0.0	397.0
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	20,887.2	9,025.1	4,427.0	34,339.3

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

\$455,000), and 142 automobiles (value \$170,000). The table above summarizes, by major classes, the nature of these losses. Damages for this reach are shown in Table 6.

**Damages—West Bank,
Fort Jackson to Venice**

The 1,800 acres of protected land in this reach were subjected to staggering winds and massive tidal surge that rose over the Mississippi River levees, practically obliterating all structures in the area. Extensive erosion of the river levee resulted from this overtopping. The surge quickly filled the protected loop then flowed over the back levee, ultimately reducing it in many places

to ground level. The area that was subject to flooding in this reach is shown in Exhibits 1 and 2.

The devastation in this area was the worst experienced in Louisiana during Camille and was comparable to the intensity of destruction suffered on the Mississippi Gulf Coast during this same storm. All residential developments were destroyed; houses and trailers were smashed and torn into scattered fragments that littered the area. In the vicinity of Boothville, only fragmentary evidence of human habitation remained, as that section was virtually wiped clean.

Business establishments that were not completely demolished were gutted. Severe damages were inflicted to all utilities and services



FORT JACKSON'S BACK LEVEE PROVIDED REPOSE FOR MANY DISPLACED BOATS AND STRUCTURES

throughout the area. A short stretch of the highway embankment in Venice eroded causing the roadway to collapse. School structures and contents took a terrible mauling from the fury of wind and tidal action. The Boothville school, a strongly constructed two-story building of concrete and steel remained standing with the entire lower floor left in a shambles. All churches in the area were totally destroyed. Storage and loading facilities at the

Getty petroleum terminal above Venice were smashed, spreading an oil slick over the area. Dead animals, fish, and vegetable matter combined to form a hazardous pollution problem.

Emergency repairs to the back levee were necessary before removal of the ponded floodwaters could begin. Pumping operations were conducted with hydraulic dredges and auxiliary pumps as previously described since the permanent pumping

TABLE 7
ESTIMATED DAMAGES^a—PLAQUEMINES PARISH
FORT JACKSON TO VENICE

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	7,670.0	3,068.0	75.6	10,813.6
Mobile Homes	1,431.0	715.5	27.5	2,174.0
Commercial	1,555.9	2,234.5	3,407.8	7,198.2
Agriculture	547.2	94.1	624.0	1,265.3
Industrial, Petroleum	1,800.0	0.0	0.0	1,800.0
Transportation	0.0	183.6	0.0	183.6
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	2,077.0	165.0	40.0	2,282.0
Churches	170.0	58.0	0.0	228.0
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	15,251.1	6,518.7	4,174.9	25,944.7

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

installation at Venice had been rendered inoperative by the high waters. So badly was this facility damaged that it was not returned to full operation until August 29. All floodwaters were evacuated by September 3.

Prior to the storm, an estimated 3,800 persons left the area in search of refuge.

Damages within this reach were 590 houses (value \$3,682,000), 320 mobile homes (value \$2,146,000), 102 commercial establishments (value \$6,247,000), industrial facilities (value \$2,500,000), 2 schools (value \$2,171,000), 6 churches (value \$228,000), and 104 automobiles (value \$184,000). Table 7

lists, by classes, all damages that occurred from Fort Jackson to Venice.

Damages—West Bank Below Venice

Tidal flooding in this unprotected area reached a maximum elevation of about 9.1 feet at The Jump. Water over the ground in the developed areas was approximately 4 feet deep. Plate 6 and Exhibit 1 illustrate the areas inundated in this reach. Improvements in this reach which lies below Venice and outside of the confines of the levee system, consist primarily of several oil



AFTER VENICE WAS DRAINED, FORMLESS FOUNDATIONS AND SCATTERED STRUCTURES MADE THE FULL EXTENT OF DAMAGE MORE APPARENT



ALTHOUGH THIS ORGAN IS INTACT, WATER AND OIL HAVE LEFT IT USELESS

company installations with associated service industries. Boat repair facilities, sheds, and docks are located nearby. Permanent homes are located on the oil company properties for the housing of some of their personnel.

Damages in this general area were much less severe than those experienced in the leveed area immediately upstream. Flood damages to the oil company properties, including the housing facilities which had a foot or so of water over the floors, were relatively moderate. No massive destruction of structures occurred. However, overflow damages to the stock and equipment of the oil service industries were heavy.

It was necessary to evacuate approximately 350 persons in anticipation of the hurricane. Damages within this reach were sustained by 70 homes (value \$588,000) and 43 businesses (value \$4,253,000). Damages for this reach are included with the losses shown for all unprotected areas and are listed in Table 3.



THE SQUARED-OFF PATTERNS OF CIVILIZATION, TELEPHONE POLES, AND ISOLATED RUINS WERE THE ONLY CLUES TO THE DEVELOPMENT WHICH HAD DISAPPEARED IN THE BOOTHVILLE-VENICE AREA

THE FIRST LAND AREAS TO FEEL CAMILLE'S FULL FURY WERE ...



SOUTH PASS LIGHT STATION AND ...



PILOTTOWN

ST. BERNARD PARISH

General

St. Bernard Parish is located along the east bank of the Mississippi River adjacent to and just below the city of New Orleans. Its entire land area is comprised of low-lying deltaic deposits which accumulated as the river periodically overflowed its banks prior to perfection of the levee system. Natural ground elevations vary from about 11 feet at the crowns of the natural alluvial levees to near sea level in the marsh areas. Above the Violet Canal, consolidation has reduced ground level elevations to as low as -6 feet.

Because of the low ground elevations and attendant hazard of overflow, flood protection works are necessary for most development. The west bank Mississippi River levee and back levees comprise a system which affords protection to urbanized areas lying near the river and along Louisiana State Highway 46 as far east as the community of Verret. Drainage in the protected area above the Violet Canal is provided by pumping.

The protected area below the Violet Canal is drained through gated gravity structures which pass through the levee. The developed areas lying along the alluvial ridges of Bayou Terre Aux Boeufs to the south of Verret, and of Bayous la Loutre and Yscloskey, are outside the protective system.

The parish population in 1960 totaled 32,186 and was estimated to be 48,300 in 1967. Chalmette, an unincorporated town with a population of about 28,000 (1967 estimate), is the parish seat and represents the greatest concentration of population in the parish. Rapid growth in the protected areas has taken place in recent years despite the

fact that severe flood damages occurred over a portion of the area during Hurricane Betsy in 1965. This growth is spurred by the spillover of inhabitants into the parish from the adjacent city of New Orleans.

Economic activities in the parish include oil and gas production—both onshore and offshore—oil and gas refining and distributing, aluminum production, sugar refining, commercial fishing and trapping, and the raising of cattle and truck crops.

Although the parish is not a major producer of oil and gas in Louisiana, it does produce substantial quantities of these minerals. In 1967, the total value of mineral production for the parish was about \$20 million. The minerals responsible for this total in order of their importance were natural gas liquid, petroleum, natural gas, and clays.

Much of the area of St. Bernard Parish is estuarine in nature, and pocked with shallow lakes, bays, bayous, and canals. These provide both sport and commercial fishermen with prolific grounds for harvesting shrimp, oysters, crabs, and both freshwater and saltwater species of fish. In 1968, the total value of commercial fishery landings in the parish was estimated to be over \$3 million.

Primary agricultural activities include the raising of beef cattle on improved pastures and marsh range, and truck cropping. In 1964, the total value of all farm products sold in St. Bernard Parish amounted to \$244,000, as compared to \$259,000 in 1959 and \$248,000 in 1954.

Damages—General

All of the developed areas in the parish that were protected by

levee systems escaped overflow by the hurricane surge. Much of the protected area had been inundated in 1965 when the tidal surge from Hurricane Betsy overtopped and breached the back levees. Improvements accomplished by local interests subsequent to Betsy were largely responsible for the absence of flooding during Camille.

Flooding occurred only in the unprotected areas outside of the levee system. Hurricane tides inundated about 251,800 acres, of which about 94 percent was marshland; only 1,000 acres of this total was cleared land used for urban and agricultural purposes. Damages to pastures were minor; however, flood damage to residential and commercial property was substantial, notably in the vicinity of Yscloskey and Hopedale where tides were the highest for any of the developed areas in St. Bernard Parish. The area that was flooded in this parish is outlined in Plate 6 and Exhibits 6 and 7.

Nearly 2,600 residents of the low areas of the parish were evacuated prior to the hurricane. By the afternoon of August 18, the water had receded sufficiently to permit residents to return and begin the task of repairing their homes and cleaning up debris.

Damage to the oil industry installations throughout the marsh and offshore area in St. Bernard Parish was moderate with the losses being far less than those experienced in neighboring Plaquemines Parish. A detailed account of the losses sustained by the petroleum industry is given on pages 114-118.

Oyster seedbeds located in the bays and inlets of the parish were damaged considerably from the overburden of marsh grass and soft mud deposited on the beds during the hurricane. In addition, extensive economic losses are attributed to damages inflicted on fish and wild-

life in the parish. While oyster damage accounted for most of the total, shrimp and furbearing wildlife were also affected. Total damages in that portion of St. Bernard Parish which was flooded are estimated at over \$6.1 million; these damages are summarized in Table 8. Detailed information on parish damages is included in subsequent paragraphs.

Damages—Verret to Yscloskey-Hopedale Area

The area east of Verret lies outside the levee loop, and is without protection from hurricane surges. Louisiana State Highway 46 is the only road that traverses this reach in its entirety. The highway was constructed on the narrow alluvial ridge of Bayou la Loutre and is intermittently lined with residences and commercial establishments along its entire length within the reach. The economy of the area is centered around marine-related activities such as commercial fishing, shrimping, oyster dredging, and sport fishing. An industrial gas processing plant located in the area also provides employment opportunities for local residents.

Tide elevations reached 8.0 feet at Yscloskey and 11.1 feet at Shell Beach. The entire land area of the Verret to Hopedale reach including the alluvial ridges along Bayous Yscloskey and la Loutre was flooded. Highway 46 up to a point $\frac{3}{4}$ of a mile east of its junction with Louisiana State Highway 300 was also flooded. From this point north on Highway 46, floodwater was confined to the lands along and east of the highway but did not overtop the road itself. Flooding decreased in depth along Highway 46 near the levee gap at Verret. Although emergency crews were on standby to close the gap,

TABLE 8
SUMMARY OF ESTIMATED DAMAGES^a
ST. BERNARD PARISH

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	277.0	110.0	25.0	412.0
Mobile Homes	0.0	96.0	6.0	102.0
Commercial	14.0	9.0	3.0	26.0
Agriculture	2.0	0.0	1.0	3.0
Industrial, Petroleum ^b	650.0	40.0	110.0	800.0
Marine	37.0	23.0	13.0	73.0
Transportation	0.0	3.0	0.0	3.0
Utilities ^b	126.0	0.0	10.0	136.0
Governmental ^b	216.0	70.0	459.0	745.0
Schools	6.0	1.0	1.0	8.0
Churches	3.0	1.0	0.0	4.0
Fish and Wildlife ^b	0.0	0.0	3,700.0	3,700.0
Other Losses ^b	0.0	0.0	134.0	134.0
TOTAL DAMAGES	1,331.0	353.0	4,462.0	6,146.0

^a In the flooded area only.
^b Data not available for individual reaches.

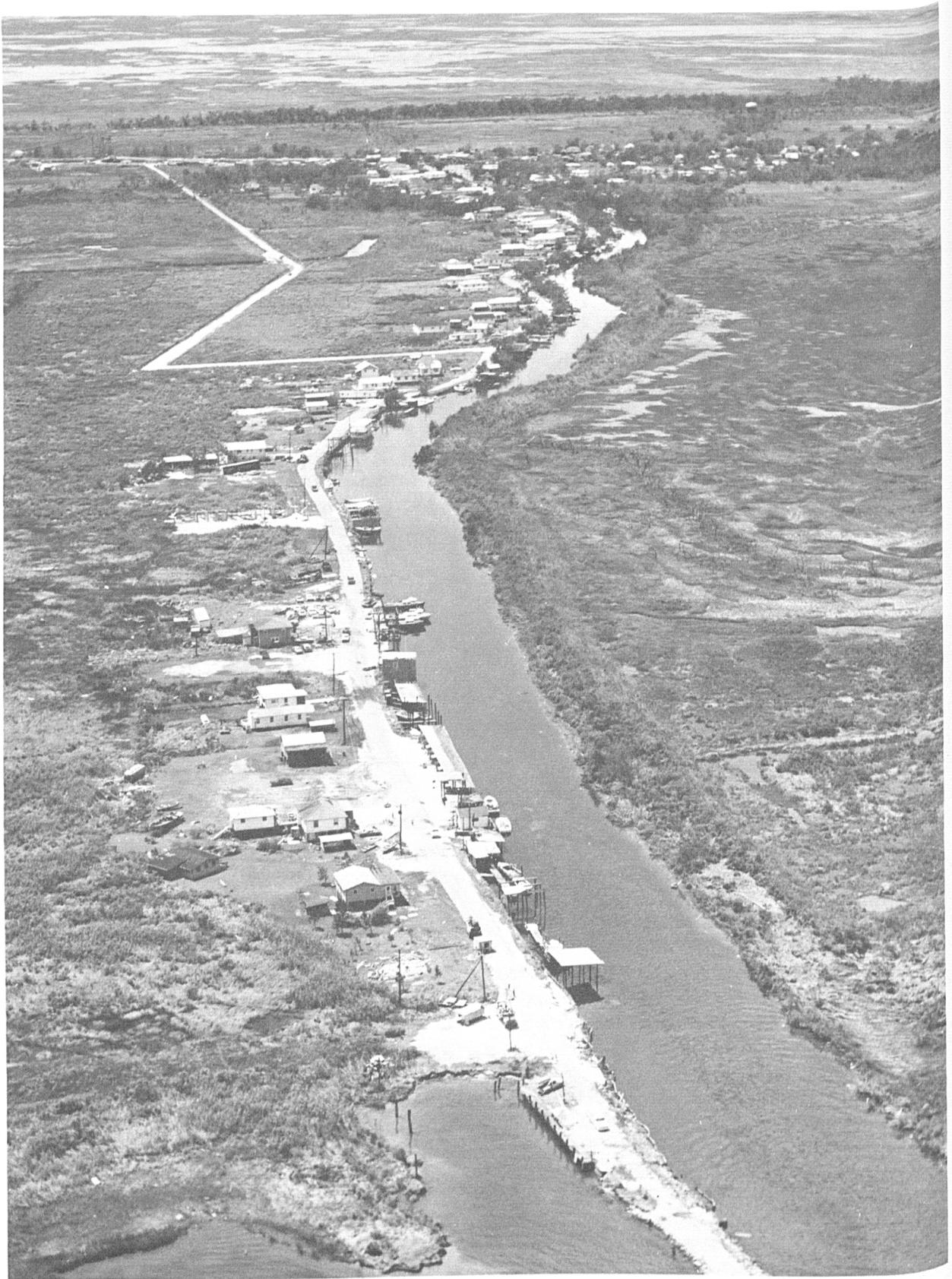
Note: This table contains losses which were not available by individual reaches; category totals shown above do not in all cases equal summations of the reaches.

no action was necessary since the hurricane tides did not rise above the roadway at this location. Exhibit 6 shows the areas inundated in this reach.

In Yscloskey, Hopedale, and the surrounding area, 336 buildings suffered varying degrees of damage. The depth of water in 123 buildings ranged from floor level to approximately 4 feet above the floor; in the remaining 212 floodwaters crested below floor level. Damages were inflicted on 250 homes, 17 commercial establishments, 30 mobile homes, 35 camps, 2 public buildings,

1 church, and 1 industrial plant having an estimated value, in the aggregate, of \$18 million.

Most of the 200 commercial and pleasure craft normally moored in the area were moved to safer waters prior to the hurricane's arrival. Some, however, did remain, and more than 20 of them were badly damaged and/or left scattered in the marsh and on the highway. Damage also occurred to marine structures such as boat sheds and wharves. A tabulation of all damages experienced in this reach is shown in the following table.



DAMAGE WAS RELATIVELY LIGHT IN YSCLOSKEY, A SMALL FISHING COMMUNITY WHERE THE FIRST FLOORS OF MOST HOMES ARE WELL ABOVE GROUND LEVEL

TABLE 9
ESTIMATED DAMAGES^a—ST. BERNARD PARISH
VERRET TO YSCLOSKEY-HOPEDALE AREA

Category	(Damages in Thousands of Dollars)			
	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	267.3	107.0	24.0	398.3
Mobile Homes	0.0	91.5	3.0	94.5
Commercial	12.3	7.5	3.0	22.8
Agriculture	2.0	0.3	0.6	2.9
Industrial, ^b Petroleum	--	--	--	--
Marine	29.0	19.0	12.0	60.0
Transportation	0.0	3.0	0.0	3.0
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	5.5	1.4	0.6	7.5
Churches	2.2	0.5	0.1	2.8
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	318.3	230.2	43.3	591.8

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

Damages—Reggio-Delacroix Area

Residents located along Louisiana State Highway 300 are also situated in an unprotected area of the parish. There are nearly 170 homes, 10 commercial establishments, 60 mobile homes, and 2 churches dotting the 7-1/2 miles of the alluvial ridge of Bayou Terre aux Boeufs. The total value of these improvements is estimated to be \$1.5 million. Here, too, the economy is centered around marine-related activities.

Residents of this area were spared flooding. High-water marks revealed maximum stages ranging from 1.9 feet at Delacroix to 2.6 feet near Reggio. Water reached the grounds on which residential developments are located, but did not enter the houses or overtop the highway. The area did not, however, escape damage from the hurricane winds; many houses, mobile homes, commercial buildings, and boat sheds suffered some roof and structural damage. Dollar damages occurring in this area are shown in the following table.

TABLE 10
ESTIMATED DAMAGES^a—ST. BERNARD PARISH
REGGIO-DELACROIX AREA

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	10.2	3.0	1.0	14.2
Mobile Homes	0.0	4.0	3.0	7.0
Commercial	2.0	1.0	0.0	3.0
Industrial, Petroleum ^b	--	--	--	--
Marine	8.0	4.2	1.0	13.2
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Churches	0.5	0.0	0.0	0.5
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	20.7	12.2	5.0	37.9

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

ORLEANS PARISH

General

Orleans Parish, which includes all of the incorporated area of the city of New Orleans, lies on both banks of the Mississippi River about 95 miles above the Head of Passes. The major portion of the developed area is situated on the left descending bank of the river. The land area of this parish consists of alluvial deposits left by river overflows that occurred prior to the installation of flood control works. The area is characterized by elevated banks along the river that slope down into low-lying marsh areas.

Damages—General

Since all of the developed area varies in elevation from a few feet above to a few feet below sea level, systems of levees, pumps, and related structures are needed for protection against flooding. During Camille, the existing levee system functioned to exclude overflow from nearly all of the urbanized area. However, failure of a small increment of the protective network along the west bank of the Inner Harbor Navigation Canal (IHNC) caused flooding and some damage in a small, densely populated area

near St. Claude Avenue.

Outside of the protected area substantial damages occurred between the levees along the IHNC, along the south shore of Lake Pontchartrain from the New Orleans Lakefront Airport to beyond Paris Road at Little Woods, along U. S. Highway 11 near Irish Bayou, and along U. S. Highway 90 between Highway 11 and the Rigolets. Minor damages were experienced along the New Orleans lakefront between the Jefferson Parish line and the IHNC. Exhibits 7 and 8 delineate the area flooded in Orleans Parish.

Total damages in the overflowed areas of Orleans Parish

amounted to about \$9.8 million. Damages sustained in the various areas overflowed are discussed in the following paragraphs. Parish-wide damages in the overflow area are summarized in Table 11.

**Damages—New Orleans
Lakeshore Area—IHNC
to Jefferson Parish**

This area is protected by a stepped concrete seawall at the shoreline and a so-called "hump" levee located 300 to 800 feet landward of the seawall. Levees and/or floodwalls paralleling the numerous

TABLE 11
SUMMARY OF ESTIMATED DAMAGES^a

ORLEANS PARISH

(Damages in Thousands of Dollars)

Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	2,463.0	1,471.0	10.0	3,944.0
Mobile Homes	0.0	13.0	0.0	13.0
Commercial	232.0	79.0	30.0	341.0
Industrial, Nonpetroleum	813.0	126.0	1,082.0	2,021.0
Marine	0.0	314.0	0.0	314.0
Transportation ^b	875.0	5.0	150.0	1,030.0
Utilities ^b	360.0	0.0	12.0	372.0
Governmental ^b	157.0	10.0	1,182.0	1,349.0
Schools	1.0	1.0	0.0	2.0
Churches	1.0	0.0	0.0	1.0
Other Losses ^b	0.0	0.0	403.0	403.0
TOTAL DAMAGES	4,902.0	2,019.0	2,869.0	9,790.0

^a In the flooded area only.

^b Data not available for individual reaches.

Note: This table contains losses which were not available by individual reaches; category totals shown above do not in all cases equal summations of the reaches.



Photograph by Terry Friedman

CAMILLE HAD BYPASSED THE CITY AND MOST NEW ORLEANIANS HAD ENDED THEIR VIGIL WHEN FLOODWATERS SUDDENLY SPREAD THROUGH A HEAVILY-DEVELOPED RESIDENTIAL AREA OF THE CITY

drainage outfall canals, Bayou St. John, and the IHNC, prevent out-flanking of the lakeshore protective system.

During Camille, wind-driven waters piled up on the south shore of Lake Pontchartrain causing wave overtopping of the seawall. As a precautionary measure, residents

were urged to evacuate parts of the lakefront area. Police buses and trucks were provided for their assistance.

The secondary levee was not overtopped; however, for a short time floodwaters from the lake entered into the protected areas via the Canal Boulevard roadway at the

levee crossing. This flow was removed simultaneously with its entry by means of the interior pumping system. An emergency sandbag closure was effected and no flooding occurred in this area.

Along the parkway area between the levee and the lakeshore, wind and tide action scoured fill behind the seawall, destroyed park benches, uprooted a few trees, and deposited minor amounts of debris.

Areas that were flooded in this reach are shown in Exhibit 7.

Damages—St. Claude-Claiborne Area—West Bank, IHNC

Flooding of a small area of

New Orleans occurred early in the morning on August 18, when the pressure of elevated water levels in the IHNC resulted in erosion of the soil beneath a building at the U. S. Coast Guard Station on the west bank of the canal. The wall of the building served as part of the confining levee system, and erosion of the soil beneath it permitted floodwaters to enter the protected area around St. Claude and Claiborne Avenues.

Floodwaters began flowing into the area at about 2:30 a.m. As soon as this condition was observed and reported, the Mayor of the city of New Orleans ordered an immediate evacuation of the area. Sandbags were dumped through metal inspection plates in the cement floor

TABLE 12
ESTIMATED DAMAGES^a—ORLEANS PARISH
ST. CLAUDE-CLAIBORNE AREA — WEST BANK IHNC

Category	(Damages in Thousands of Dollars)			
	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	131.2	26.0	0.0	157.2
Commercial	59.2	12.5	12.3	84.0
Industrial, Nonpetroleum ^b	10.2	2.0	6.0	18.2
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Schools	0.6	0.5	0.0	1.1
Churches	0.5	0.0	0.0	0.5
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	201.7	41.0	18.3	261.0

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

of the Coast Guard building by New Orleans Levee Board and U. S. Coast Guard personnel in an effort to halt the flow. These efforts were not altogether successful, but did result in sufficient retardation of the flow to permit the orderly evacuation of an estimated 1,000 persons. The New Orleans Police Department, using police buses, squad cars, and trucks aided in the evacuation. However, many people used their own automobiles for transportation.

A recession of the water level in the canal and continued sandbagging efforts checked flow into the area at about 6 a.m. on August 18. By 11 o'clock of the same morning, the floodwaters had been completely removed from the streets by the city's drainage system. An outline of the area that was flooded is shown in Exhibit 7.

The area of inundation was comprised of a 36-square block residential area and a 73-acre industrial complex. Situated in the area are 521 residences, 42 commercial establishments, 2 industries, 1 school, and 1 church. An estimated 2,000 people inhabit the area.

This flooding occurred in one of the older residential sections of New Orleans where most of the homes are built on piers that raise the floor level approximately 3 feet above the ground level. For this reason, only a few homes were flooded. Damages were sustained by 7 houses, 8 businesses, 1 small industry, 1 school, and 6 automobiles. Depth of overflow in the area averaged about 1 foot with the deepest flooding of about 2.5 feet located adjacent to the canal.

A permanent floodwall is presently being constructed along the west side of the IHNC to prevent flooding of this area by hurricane tides in the future. In order to provide temporary protection until the

floodwall is complete, the void under the floor of the undermined U. S. Coast Guard building has been filled with sandbags, a wooden bulkhead has been constructed along the landward side of the building where the water flowed out, and sandbags have been placed against the bulkhead.

Table 12 outlines the estimated dollar damages that were sustained in the area.

Damages—IHNC Area

Thirty-seven industrial establishments operate along the canal, 20 on the west side and 17 on the east. Cement plants, steel fabricating and sales companies, marine equipment companies, towing companies, a glass container company, and a coffee processing company are among the many different types of industrial establishments in operation. All of these companies are located outside the protective system and, therefore, are not protected against tidal flooding.

Ground elevation in the area averages approximately 5 feet. The tidal surge caused extensive flooding in the area with depths as great as 5 feet over floors in some buildings. Damages to structures, machinery, equipment, and supplies were extensive. Many businesses were unable to operate at full efficiency for two weeks, and some were still operating below capacity six weeks after the storm. Estimated losses in the overflowed area are contained in Table 13 and the area flooded is outlined in Exhibit 7.

Damages—New Orleans Lakeshore Area—Airport to Little Woods

A levee running along the

TABLE 13
ESTIMATED DAMAGES^a—ORLEANS PARISH
INNER HARBOR NAVIGATION CANAL AREA

Category	(Damages in Thousands of Dollars)			
	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Industrial, Nonpetroleum	703.0	124.0	953.9	1,780.9
Marine	0.0	135.0	0.0	135.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	703.0	259.0	953.9	1,915.9

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

TABLE 14
ESTIMATED DAMAGES^a—ORLEANS PARISH
NEW ORLEANS LAKESHORE AREA—AIRPORT TO LITTLE WOODS

Category	(Damages in Thousands of Dollars)			
	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	261.9	150.4	0.0	412.3
Commercial	30.0	4.0	0.0	34.0
Marine	0.0	36.0	0.0	36.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	291.9	190.4	0.0	482.3

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

shoreline of Lake Pontchartrain and extending from the New Orleans Lakefront Airport to Paris Road at Little Woods forms part of the protection for a developing urban area that lies east of the IHNC. Approximately 160 camps and 1 marina are located on the lake-side of the levee and, hence, are not protected from flooding. The camps are built on pilings with the floors several feet above normal lake level. Walkways, called "runs," connect the camps to the shore. Other runs built to the rear of the camps give access to deep water for swimming, boating, and fishing.

Overflow in this area is shown in Exhibit 7. Nearly all of the camps had 1 to 2 feet of water over the floors. The lakeward ends of most camps were badly damaged and at least nine camps were completely destroyed. Damage to the runs was also extensive but clean-up costs in this area were generally light.

Table 14 shows the damages that occurred to an estimated 160 camps and 1 marina in the overflowed area.

Damages—Irish Bayou Area

This community is located west of the Chef Menteur-Rigolets area on a marshy peninsula in Lake Pontchartrain. Development which has taken place on both sides of U. S. Highway 11 for about 1.5 miles south of its junction with U. S. Interstate Highway 10, consists of modestly priced frame camps and homes, a few local retail business establishments, and several small marine service businesses. These improvements are located adjacent to Irish Bayou, Little Irish Bayou, and Irish Bayou Canal, all of which are directly influenced by

Lake Pontchartrain tides.

Approximately 90 homes and camps were flooded to an average depth of 1 foot over the floors as a result of rising tides during Camille. The extent of this overflow is outlined in Exhibit 7. Damages in the Irish Bayou area were not as extensive as in some nearby areas. However, Highway 11 which is low-lying and frequently flooded by tropical storm tides was rendered impassable by Camille.

A breakdown of the losses in this area is contained in Table 15.

Damages—Venetian Isles Area

Venetian Isles is a prestige-class residential subdivision located along U. S. Highway 90 in the eastern portion of New Orleans. It is a typical Florida-type development, laced with man-made canals that are navigable by small pleasure craft. These canals were dug by the developers and the spoil was utilized to raise the ground elevation to approximately 6.5 feet prior to the construction of improvements.

Of 40 houses located in the area only one escaped flooding. Depths of flooding over the floors varied up to a total of 3 feet, with an average depth of approximately one-half foot. The period of flooding was only a few hours—as soon as the wind direction changed, the tides began to recede. Flooded area in this vicinity is shown in Exhibit 7. Losses to furnishings were minimal since most of the occupants remained in their homes throughout the storm and raised the furnishings above flood level. Boat damages were minor. Table 16 contains a summation of the losses in this area.

TABLE 15
ESTIMATED DAMAGES^a—ORLEANS PARISH
IRISH BAYOU AREA

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	130.0	150.0	10.0	290.0
Mobile Homes	0.0	13.1	0.0	13.1
Commercial	4.9	4.8	0.0	9.7
Marine	0.0	5.0	0.0	5.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	<u>134.9</u>	<u>172.9</u>	<u>10.0</u>	<u>317.8</u>

^a In the flooded area only.

^b Data not available by individual reaches—included in parish totals.

TABLE 16
ESTIMATED DAMAGES^a—ORLEANS PARISH
VENETIAN ISLES AREA

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	24.0	46.0	0.0	70.0
Marine	0.0	2.0	0.0	2.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	<u>24.0</u>	<u>48.0</u>	<u>0.0</u>	<u>72.0</u>

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

Damages—U. S. Highway 90 Between U. S. Highway 11 and Chef Menteur Pass (Excluding Venetian Isles)

This area contains 20 homes, 7 businesses, and 2 industrial marine enterprises located on the north side of U. S. Highway 90. Bayou Sauvage lies to the rear of these developments. Tidal overflow completely covered this area to an average of about 3-1/2 feet above ground level necessitating the closing of Highway 90 to traffic. Floodwaters, which remained in the area for approximately a half day and then receded as the wind direction changed, rose above all home and business floor levels. Commercial operations were closed

down for periods varying from two days to nearly two weeks. Exhibit 7 outlines the area that was flooded in this reach. Flood losses were mainly related to plant, equipment, and business losses in the marine industry. Table 17 contains the detailed losses experienced in this area.

Damages—U. S. Highway 90 Between Chef Menteur Pass and the Rigolets

From the northeastern edge of New Orleans, U. S. Highway 90 extends in a northeasterly direction for a distance of approximately 8.6 miles, dividing the marsh area between Lakes Pontchartrain and

TABLE 17

ESTIMATED DAMAGES^a—ORLEANS PARISH

U. S. HIGHWAY 90 BETWEEN HIGHWAY 11 AND CHEF MENTEUR PASS, EXCLUDING VENETIAN ISLES

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages ^s
	\$	\$	\$	\$
Residential	3.3	2.7	0.0	6.0
Commercial	10.5	9.8	1.9	22.2
Industrial, Nonpetroleum	100.0	0.0	122.0	222.0
Marine	0.0	1.2	0.0	1.2
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	113.8	13.7	123.9	251.4

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

Borgne. The highway embankment is, in most places, at elevation 9 feet, and serves as a formidable barrier to tidal surges from Lake Pontchartrain on the west or from the Gulf of Mexico, Lake Borgne, and Lake St. Catherine on the east.

Development in this area generally consists of camps that are visited on weekends by people who live in the more urbanized parts of New Orleans or its suburbs. These people enjoy the many water-oriented activities offered by Lakes Pontchartrain, St. Catherine, and Borgne, and the numerous bayous and waterways in the surrounding area. Structures average about \$10,000 in value and usually are elevated several feet above ground level by piling.

About 478 camps were flooded

during Camille, some to depths as great as 5 feet over the floor. Most camps remained, however, substantially intact. An estimated 71 camps disappeared, and 31 camps and 1 commercial establishment suffered combined tidal surge and wind damages amounting to total loss.

The most severe damage was sustained by development on the northwest, or Lake Pontchartrain, side of U. S. Highway 90. Severity of damage increased from Chef Menteur toward the Rigolets due primarily to an increasing vulnerability to tidal surge and wave action. The highway embankment served as a barrier to break up wave action from Lake Pontchartrain, thereby minimizing surge effects on the southeast side of Highway 90.



MANY VACATION AND WEEKEND HOMES ON HIGHWAY 90 BETWEEN CHEF MENTEUR PASS AND THE RIGOLETS WERE REDUCED TO RUBBLE

TABLE 18

ESTIMATED DAMAGES^a—ORLEANS PARISH
U. S. HIGHWAY 90 BETWEEN CHEF MENTEUR PASS
AND THE RIGOLETS

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages ^s
	\$	\$	\$	\$
Residential	1,912.7	1,096.1	0.0	3,008.8
Commercial	126.8	47.7	16.1	190.6
Marine	0.0	135.0	0.0	135.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	2,039.5	1,278.8	16.1	3,334.4

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

To the west of the highway, tons of debris were deposited and cost of cleanup was substantial. Flooding closed Highway 90 from U. S. Highway 11 to the Mississippi Gulf Coast. The area along Chef Menteur, on the west side of Highway 90, and the entire area along the east side of the highway were generally leeward of

the worst hurricane surge, and hence, were to some extent, spared. However, damage from tidal overflow and wind was considerable in the area.

Exhibit 8 shows an outline of the area flooded in this vicinity. A breakdown of the damages sustained in this area is contained in the table above.

ST. TAMMANY PARISH

General

This parish, particularly the southern portion located along the shore of Lake Pontchartrain, is a rapidly developing suburban, residential, and recreational area. Its total land area encompasses 581,100 acres, and it has a population of over

59,000 (estimated 1967). The Lake Pontchartrain Causeway and the U. S. Interstate Highway 10 Bridges provide fast and convenient access from the New Orleans metropolitan area to the Covington and Slidell areas. Location of National Aeronautics and Space Administration facilities in eastern New Orleans

and satellite facilities in Slidell have stimulated new development in the southeastern portion of the parish.

Damages—General

The lakeshore area was flooded during the passage of Camille by rising tides and wind-driven surges from Lakes Pontchartrain and Borgne; the extent of the flooding discussed in the sections below is outlined in Exhibit 9. Subdivision and camps located in exposed areas along the lakeshore south of Slidell were hardest hit by the storm. Damages to improvements in these areas comprised the bulk of losses in St. Tammany Parish. Total area flooded amounted to 50,400 acres and is inhabited by an estimated 2,000 persons.

Portions of U. S. Highways 11, 90, and 190, Louisiana State Highways 433 and 22, and many parish and local roads were flooded. Some parish and local roads were so ob-

structed by debris that the use of heavy equipment was required for cleanup before normal traffic could be resumed. Within 24 hours after the storm, all roads were open to traffic except Highway 433, which was badly eroded. Damages to railroads, navigation channels, beaches, and seawalls were minor. Since development in the low-lying areas which were flooded is preponderantly residential, other types of losses in these areas were minor.

Approximately 5,000 St. Tammany residents occupied storm shelters during the time the hurricane posed a threat to the parish; many were evacuated by local and parish agencies. Telephone and electric services were interrupted in some areas as lines, poles, and transformers were damaged. Loss of power was a particular hardship to some 20,000 households which were without electricity for periods ranging from two to five days. Total storm damages in the overflow area amounted to approximately



Courtesy of Slidell-Saint Tammany Times

LOUISIANA STATE HIGHWAY 433, BETTER KNOWN AS "SALT BAYOU ROAD," IS A GOOD EXAMPLE OF THE ROAD DAMAGE CAUSED BY CAMILLE-DRIVEN WATER

TABLE 19
SUMMARY OF ESTIMATED DAMAGES^a
ST. TAMMANY PARISH

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	1,617.0	1,053.0	76.0	2,746.0
Mobile Homes	0.0	130.0	0.0	130.0
Marine	78.0	59.0	13.0	150.0
Transportation ^b	0.0	10.0	0.0	10.0
Utilities ^b	100.0	0.0	6.0	106.0
Governmental ^b	22.0	0.0	1,562.0	1,584.0
Other Losses ^b	<u>0.0</u>	<u>0.0</u>	<u>200.0</u>	<u>200.0</u>
TOTAL DAMAGES	1,817.0	1,252.0	1,857.0	4,926.0

^a In the flooded area only.

^b Data not available for individual reaches.

Note: This table contains losses which were not available by individual reaches; category totals shown above do not in all cases equal summations of the reaches.

\$4.9 million. These damages are discussed more fully in the following paragraphs. A summary of the total damages is included in Table 19.

Damages— Treasure Isle

This is a waterfront subdivision on a low, promontoried shoreline of Lake Pontchartrain. It is located between Slidell to the north and the Rigolets to the south. Development began some 20 years ago as a summer haven for retired people. Although some camps of modest value built on piling are located in the area, the typical, recently built structures are brick residences constructed on slabs at a cost of about \$30,000. Developments include 47 houses having a total estimated

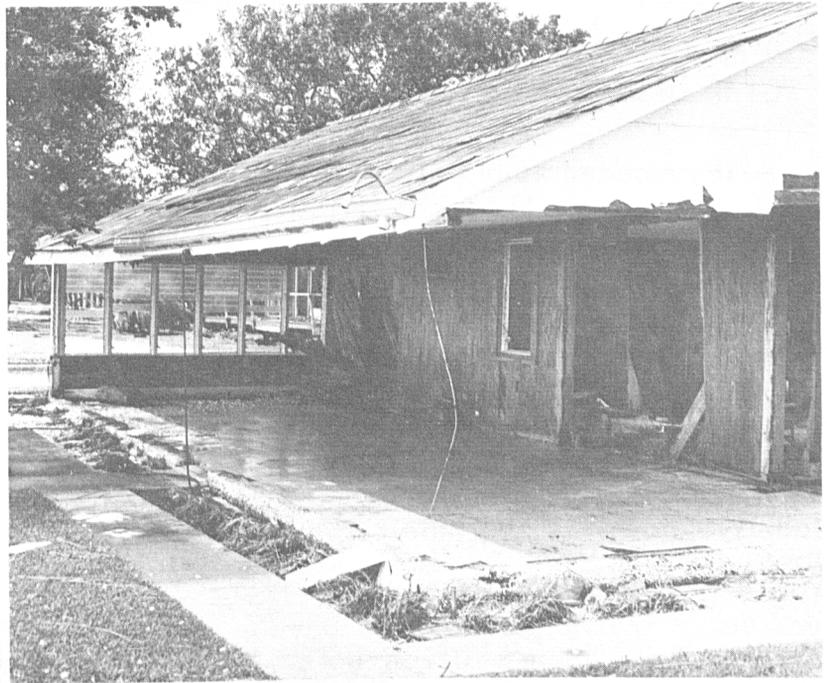
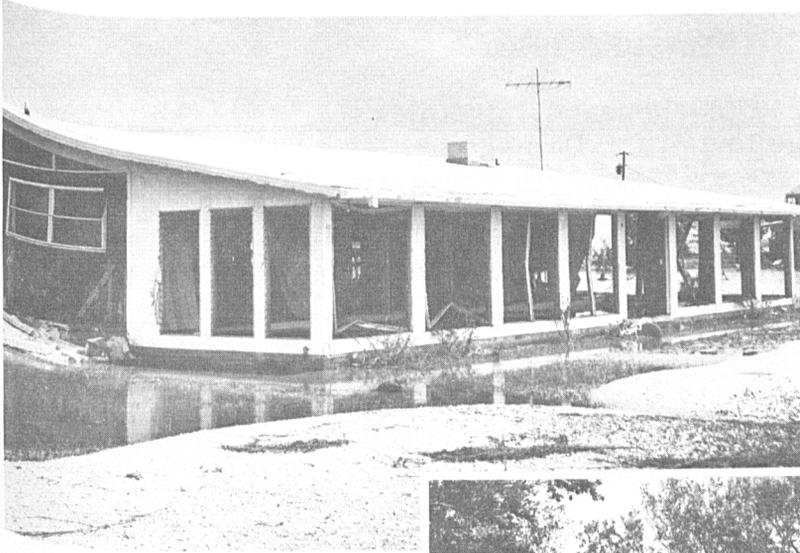
value of \$1.3 million.

As Camille passed to the east of Treasure Isle, the area was pounded with hurricane force winds. The hurricane surge flooded houses up to a depth of 6 feet over the floor. Sixteen residences were almost totally destroyed and the remaining 31 were heavily damaged.

Louisiana State Highway 433, which provides access to Treasure Isle, was badly damaged for about a mile west of its junction with U. S. Highway 90. The highway was closed as a safety precaution since large portions of the pavement and embankment were destroyed by wave action, particularly on the north lane of this two-lane highway. Damage to the highway is estimated at \$22,000.

Most inhabitants of the community evacuated prior to the storm. Table 20 summarizes dollar damages in this area.

TREASURE ISLE, A COMMUNITY ON LAKE PONTCHARTRAIN'S NORTH SHORE NEAR THE RIGOLETS, WAS THE SITE OF TWO OF LOUISIANA'S STORM FATALITIES



Photos courtesy of Slidell-Saint Tammany Times

TABLE 20
ESTIMATED DAMAGES^a—ST. TAMMANY PARISH
TREASURE ISLE

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	697.2	409.5	0.0	1,106.7
Marine	0.0	24.0	0.0	24.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	697.2	433.5	0.0	1,130.7

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

Damages—Salt Bayou Road

Salt Bayou enters Lake Pontchartrain just north of Treasure Isle and west of Louisiana State Highway 433. Development of what is locally known as the "Salt Bayou Road Community" begins near the Highway 433 Bridge which carries vehicular traffic across the bayou. Houses have been built on both sides of the road from the bridge to Lake Pontchartrain. Some of the families who live in these modest dwellings represent third-generation inhabitants of this community.

Most of the houses are elevated only a few feet above water level, and, as a result, rising tides flooded approximately 50 of them to a depth of about 3 feet over the floor causing substantial damage to buildings and contents. Although several camps are located in the marsh area on both sides of Highway 433 north

of the Salt Bayou Road Community, these are built on piling 8-10 feet above the marsh level and suffered only minor wind damage. Most of the estimated 200 residents of the Salt Bayou Road Community evacuated prior to the storm. Table 21 summarizes the losses sustained in the area.

Damages—North Shore and Vicinity

Heavily damaged development in this area included approximately 125 camps located on the lakeside of a local access road that parallels the north shore of Lake Pontchartrain between U. S. Highway 11 and U. S. Interstate Highway 10 (I-10). These camps averaging \$10,000 in value, are supported by piling driven into the lake bottom. They were hard hit by hurricane winds, rising water, and wave action.

Twenty-five of these camps

TABLE 21
ESTIMATED DAMAGES^a—ST. TAMMANY PARISH
SALT BAYOU ROAD

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages \$
Residential	90.0	100.0	20.0	210.0
Marine	5.0	5.0	2.0	12.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	95.0	105.0	22.0	222.0

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

were destroyed, leaving only the foundations. Another 100 camps had an average of 2.5 feet of water over the floors. The sides of most camps facing the lake were severely damaged by wind and wave action. Numerous walkways were destroyed or badly damaged and approximately 50 boats were lost or badly damaged.

Private interests are reclaiming the marsh area north of Lake Pontchartrain between I-10 and Highway 11. This area, known as Eden Isles, is being developed as a Florida-type subdivision with a network of navigable waterways. The levee protecting this area from lake waters was covered by debris from the North Shore camps. Clearance of this debris from the camp access road required heavy machinery and took about one week.

Total damage to North Shore camps and contents is estimated at over \$1 million. Damages to piers, walkways, and boats amounted to

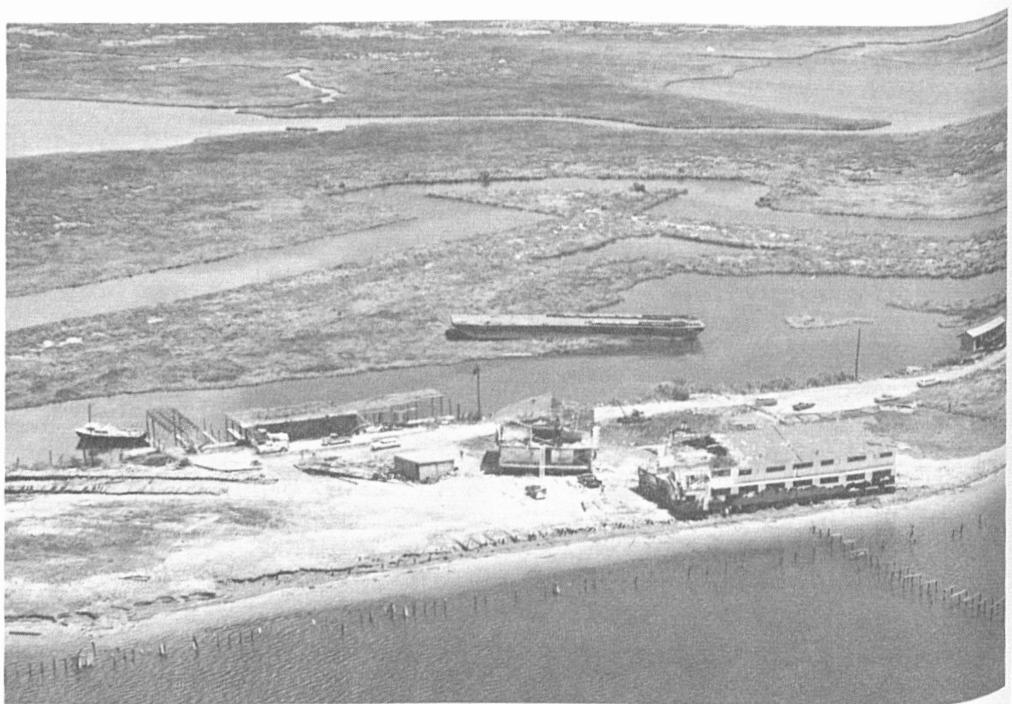
about \$100,000. Howze Beach, located just east of North Shore, has only a few camps, and flooding in this area caused damages aggregating \$20,000.

Along Highway 11 north of the lake, approximately 30 low-cost structures had about 6 inches of water over the floors. The total loss due to wind and flooding amounted to an estimated \$90,000. A summation of all damages in the North Shore area is included in Table 22.

Damages—North Shore Beach

This lakefront subdivision, consisting of about 125 units, is located on the lakeshore between U. S. Highway 11 and Big Point. Houses in the \$20,000-\$30,000 range, built on piling which elevate the first floor 8-10 feet above ground level, are typical. Most structures have

CAMPS ALONG THE NORTH SHORE OF ...



LAKE PONTCHARTRAIN RECEIVED HEAVY DAMAGE



Courtesy of Slidell-Saint Tammany Times



Courtesy of Slidell-Saint Tammany Times

TABLE 22
ESTIMATED DAMAGES^a—ST. TAMMANY PARISH
NORTH SHORE AND VICINITY

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property \$	Damage to Movable Property \$	Other Losses \$	Total Damages ^s \$
Residential	685.7	515.0	50.0	1,250.7
Marine	70.0	30.0	10.0	110.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	755.7	545.0	60.0	1,360.7

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

only a carport and/or utility room at ground level and for this reason little damage resulted from tides that flooded the area to a depth of about 2 feet above ground level.

The minor nature of roof damage, and the paucity of missing shingles and other roof coverings, as compared to the North Shore area, suggests that the magnitude of wind-induced stresses was far less in North Shore Beach. Total damages in this area were summarized in Table 23.

Damages—Slidell

Five subdivisions in Slidell were flooded primarily by tidal waters backing up through Bayou Bonfouca into the local drainage systems. Four of these subdivisions—Palm Lake, Park Place, Lakeshore Village, and Slidell Country Club Estates—had water in the streets and in yards nearly up to floor levels. The fifth

subdivision, Coin du Lestin Estates, a Florida-type development, experienced flooding in several homes. Total damages in the flooded portions of these five subdivisions are summarized in Table 24.

Damages—Mandeville

Waves swept over the Lake Pontchartrain seawall and water moved inland for about a block in this area. A few houses were flooded and water reached floor level in about 15 others. Wind damages in the flooded area were nominal, and therefore, all damages are attributed to flooding. Total damages are shown in Table 25.

Damages—U. S. Highway 90 North of the Rigolets

A small community of 24 mobile homes located along

TABLE 23
ESTIMATED DAMAGES^a —ST. TAMMANY PARISH
NORTH SHORE BEACH

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	75.0	5.0	5.0	85.0
Marine	2.5	0.0	1.0	3.5
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	77.5	5.0	6.0	88.5

^a In the flooded area only.
^b Data not available for individual reaches —included in parish totals.

TABLE 24
ESTIMATED DAMAGES^a —ST. TAMMANY PARISH
SLIDELL

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	62.7	18.5	1.0	82.2
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	62.7	18.5	1.0	82.2

^a In the flooded area only.
^b Data not available for individual reaches —included in parish totals.

Highway 90 near its junction with Louisiana State Highway 433 suffered severe wind and water damage. These losses are shown in Table 26.

TABLE 25
ESTIMATED DAMAGES^a - ST. TAMMANY PARISH
MANDEVILLE

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Residential	6.5	5.2	0.0	11.7
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	6.5	5.2	0.0	11.7

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

TABLE 26
ESTIMATED DAMAGES^a - ST. TAMMANY PARISH
U. S. HIGHWAY 90 NORTH OF THE RIGOLETS

(Damages in Thousands of Dollars)				
Category	Damage to Fixed Property	Damage to Movable Property	Other Losses	Total Damages
	\$	\$	\$	\$
Mobile Homes	0.0	130.0	0.0	130.0
Transportation ^b	--	--	--	--
Utilities ^b	--	--	--	--
Governmental ^b	--	--	--	--
Other Losses ^b	--	--	--	--
TOTAL DAMAGES	0.0	130.0	0.0	130.0

^a In the flooded area only.

^b Data not available for individual reaches—included in parish totals.

Damages--Other Areas in St. Tammany Parish

Minor flood problems were

experienced at locations other than those mentioned above, but the depth and duration of flooding were such that damages were relatively minor.

OTHER PARISHES

Jefferson Parish

This parish is bordered by Lake Pontchartrain on the north, Plaquemines and Orleans Parishes on the east, the Gulf of Mexico on the south, St. Charles and Lafourche Parishes on the west, and is divided by the Mississippi River. A small cleared area outside of the levee system along Lake Pontchartrain in the northern part of the parish was inundated. In the southern part of the parish, open and wooded marshland was flooded as far north as Mud Lake. Grand Isle and Cheniere Caminada, located at the southern tip of the parish, experienced flooding along their respective coastlines; however, the flooding stopped short of causing any significant damage. The flooded area in the parish totaled 10,200 acres and is shown in Plate 6. Damage in the overflow area was negligible.

St. Charles Parish

The parish is bordered on the north by Lake Pontchartrain, on the east by Jefferson Parish and Lake Salvador, on the south by Lafourche Parish, and on the west by St. John the Baptist Parish. It is divided into two segments by the Mississippi River. Although no flooding occurred in that part of the parish which lies south of the Mississippi River, substantial areas of open and wooded marshland north of the river were inundated by overflow from Lake Pontchartrain. Lake Pontchartrain overflow also occurred in

areas of cleared and wooded land located in the Bonnet Carré Floodway. The flooding was contained by the levee system along the border between St. Charles and Jefferson Parishes and by the Airline Highway (U. S. Highway 61) which runs in an east-west direction through the parish. The total area overflowed was 25,300 acres and is outlined in Plate 6. Damage in the area of overflow was negligible.

Lafourche Parish

The parish is bordered by St. James and St. John the Baptist Parishes on the north, St. Charles and Jefferson Parishes on the east, the Gulf of Mexico on the south, and Terrebonne and Assumption Parishes on the west. A broad expanse of marshland and a comparatively small area of wooded land was flooded in the southerly part of the parish. This flooding extended over to and followed along Louisiana State Highway 1 southward from the vicinity of Leeville, then eastward to the Jefferson Parish line. The total area flooded amounted to 47,100 acres and is shown in Plate 6. No appreciable damage occurred incident to this flooding, and overall damage within the area of overflow was negligible.

St. John the Baptist Parish

The parish is bordered on the

north by Livingston Parish, Lake Maurepas, and Tangipahoa Parish, on the east by Lake Pontchartrain and St. Charles Parish, on the south by Lafourche Parish, and on the west by St. James and Ascension Parishes. It is divided into two segments by the Mississippi River. Overflow from Lake Pontchartrain covered a large area of wooded marshland and smaller areas of cleared land and open marshland on the east side of the parish. No flooding occurred in that part of the parish which is located south of the Mississippi River and the flooding which occurred north of the river did not cause any appreciable damage. The overflow covered a total of 18,400 acres; the extent of this flooding is outlined in Plate 6. Overall damage in the area of overflow was negligible.

Tangipahoa Parish

This parish has shorelines on both Lake Pontchartrain and Lake Maurepas. The two lakes are connected by Pass Manchac, which runs east and west on the parish line between Tangipahoa Parish and St. John the Baptist Parish. Tangipahoa Parish is also bordered by Pike County, Mississippi, to the north, Washington and St. Tammany Parishes to the east, and St. Helena and Livingston Parishes to the west. A large area of wooded marshland and a comparatively smaller area of open marshland were flooded by overflow from Lake Pontchartrain. No appreciable damages resulted from the flooding which covered 49,400 acres, and overall damages in the area of overflow were negligible. An outline of the flooded area is shown in Plate 6.

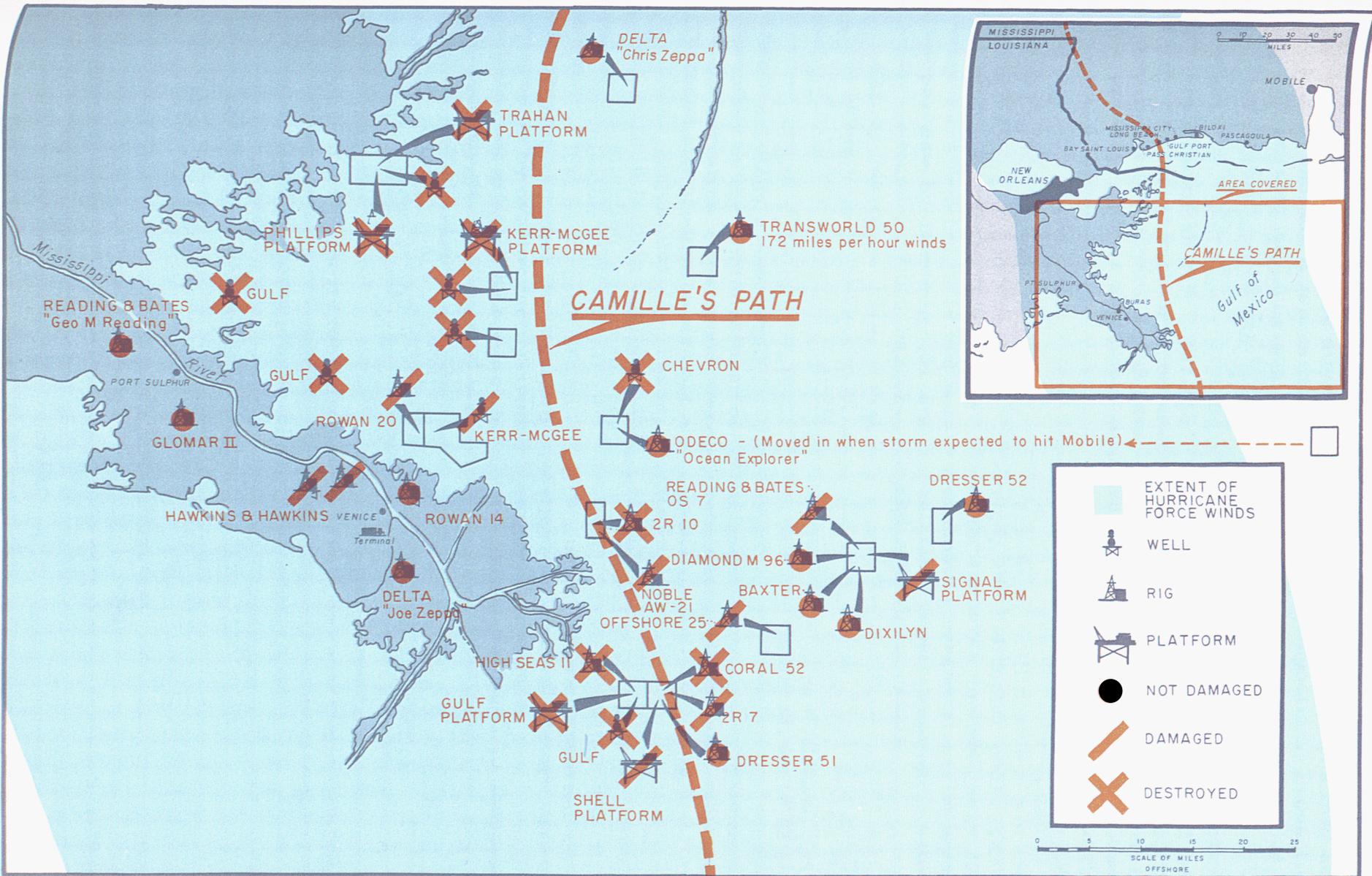
PETROLEUM INDUSTRY

The havoc wrought by Camille's winds, estimated at 201.5 mph, left oil operators struggling with catastrophic problems. Whereas Hurricanes Hilda in 1964 and Betsy in 1965 moved ashore on the west side of the Louisiana delta, Camille slashed through the offshore area just east of the delta and severely battered oil operations in Plaquemines Parish along the eastern side of the Mississippi River.

Offshore installations in highly productive areas were badly damaged at South Pass, Main Pass, and Breton Sound. In the intermediate zones of marshes and shallow bays such as Quarantine Bay, Cox Bay, and Black Bay, installations which were overwhelmed by wind and high water received full impact of the breaking action from giant waves. Damages to facilities in the marshes west of the Mississippi River were

relatively light. Onshore installations, such as refineries and supply houses located in lower Plaquemines Parish, suffered high damage tolls. Plate 7 is a pictorial presentation of the storm's effect on Louisiana petroleum operations within the envelope of hurricane force winds.

From the Mississippi delta to the St. Bernard Parish line, at least 4,000 oil wells were shut down. The Offshore Operators Committee advised tapering off production operations on Thursday, August 14. Actual shutdown and evacuation started Saturday morning. A total of 3,000 workmen were evacuated, and by Saturday night no one was left on the platforms. Even though this extremely dangerous storm struck production facilities with its full force and fury, no injuries to petroleum production personnel were reported.



CAMILLE'S IMPACT ON OIL PRODUCTION FACILITIES
 (Courtesy Offshore Magazine - September 1969)

The more than 4,000 oil wells which were shut down represented about 10 percent of Louisiana's wells. A reduction of nearly 400,000 barrels per day of crude oil was reported by the Louisiana Conservation Department shortly after the storm. A week later, production was still down by about 270,000 barrels per day, and by September 1, production losses were about 160,000 barrels per day. Losses of production were estimated to be down to 60,000 barrels per day by October 1, and 20,000 barrels per day by November 1. Production losses were reduced to 10,000 barrels per day by December 31 and further reduced to 7,000 barrels per day by March 1, 1970. Total storm-induced production losses are expected to reach 10.0 million barrels.

Production limits or "allowables" previously announced for September by the Commissioner of the Conservation Department were rescinded and production was set at the higher August levels. These levels were to remain in effect until the storm situation was resolved. The Commission also permitted production lost as a result of shutdown during and after the storm to be made up by overproduction from oil fields not affected by the storm. Consequently, it is anticipated that about 81 percent of the 10.0 million barrels of lost production will be recovered. About \$200,000 will be

lost because of the temporary suspension of production. Production which will not be recovered due to loss of refining equipment is estimated at about \$5.7 million.

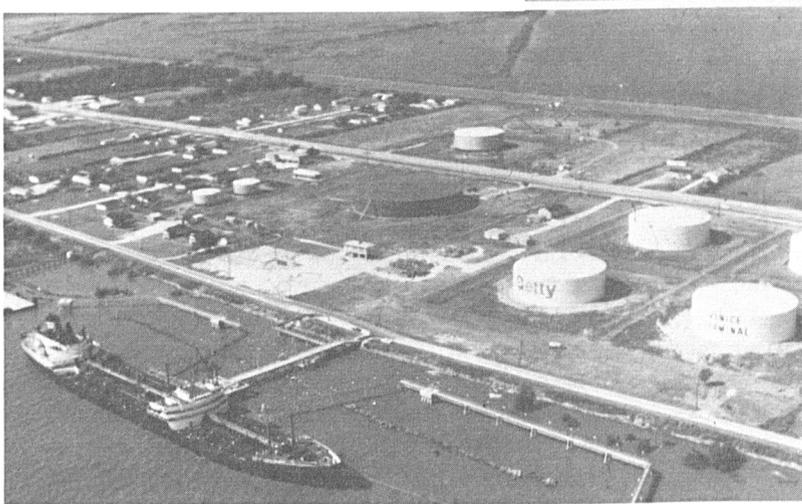
Present estimates indicate that petroleum equipment and facilities suffered damages of \$65.3 million. This includes costs for rebuilding or replacing production facilities, tanks, platforms, heater-treaters, oil-gas separators, pumping units, gas scrubbers, camps for personnel, drilling rigs, workover rigs, and helicopter pads. Other costs incurred include those for evacuating personnel, paying standby salaries, repairing pipeline damage, and dredging canals.

Four platforms were swept away completely and two platforms were badly damaged. Three fixed drilling rigs were destroyed and 7 were badly damaged, while 12 escaped loss. Mobile rigs escaped serious damage, a surprising fact considering the number subjected to Camille's battering wind and waves. Wells fared badly with seven destroyed and one damaged. There was a total absence of blowing wells and few leaking wells. The U. S. Geological Survey reported no oil slicks in Federal waters and only one in State waters.

Total damages to the petroleum industry in Louisiana caused by Camille are estimated to be \$71.2 million, as broken down in the following summation.

Damage to fixed property (onshore)-----	\$26,550,000
Damage to fixed property (offshore) -----	31,350,000
Damage to movable property-----	3,750,000
Other expenses (cleanup, evacuation, salaries)-----	3,650,000
Loss of production-----	<u>5,900,000</u>
Total losses -----	\$71,200,000

THE LEADING INDUSTRY

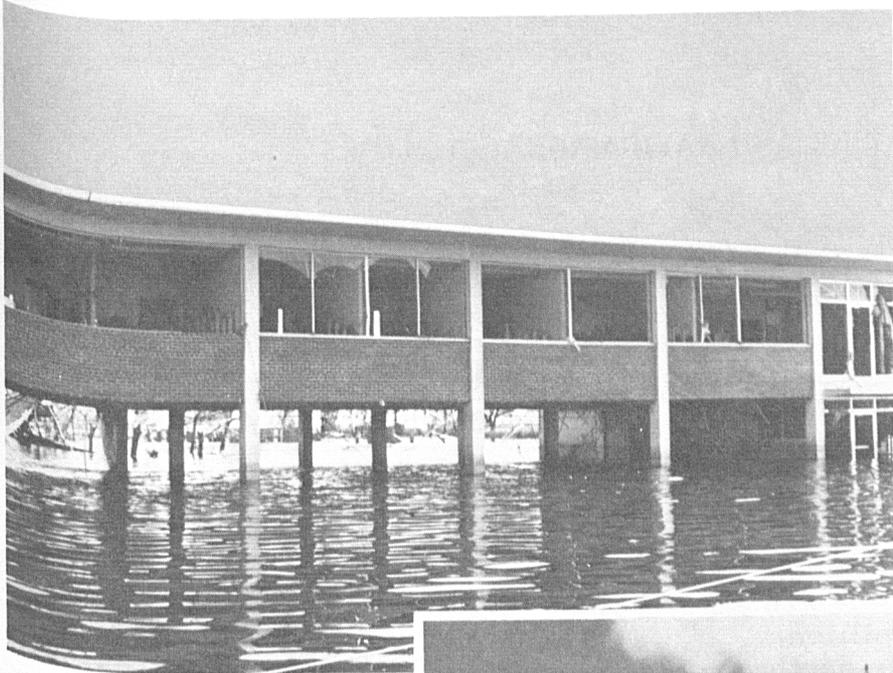


OIL ...

Courtesy of Getty Oil Co.



IN PLAQUEMINES PARISH...



Courtesy of Getty Oil Co.



Courtesy of Getty Oil Co.

SUFFERED EXTENSIVE DAMAGE

One providential aspect of the storm's aftermath is the opportunity for offshore operators to acquire valuable information through research. The Storm Research Institute in Houston, Texas, sponsored by a syndicate of oil companies, is

analyzing wave forces that acted on instrumented platforms in the path of the hurricane. This study may yield valuable information on underwater forces and their effects on various construction techniques.

MARINE AND NAVIGATIONAL DAMAGES

Tidal surges generated by Camille inflicted substantial damages on marine and navigational facilities and equipment in Louisiana. Losses to marine facilities and equipment amount to an estimated \$3.9 million in the parishes of Plaquemines, Orleans, St. Bernard, and Jefferson. Expenditures required to restore project depths in shoaled navigation channels and to replace navigation aids are expected to reach \$5.7 million.

Loss of navigable depths from shoaling occurred in the entrance channels of the Mississippi River (South and Southwest Pass), the MR-GO, and the Gulf Intracoastal Waterway (GIW) east of New Orleans. Shoaling was greatest in the MR-GO. Comparison of hydro-

graphic surveys of this channel made before and after the storm indicated shoaling as follows:

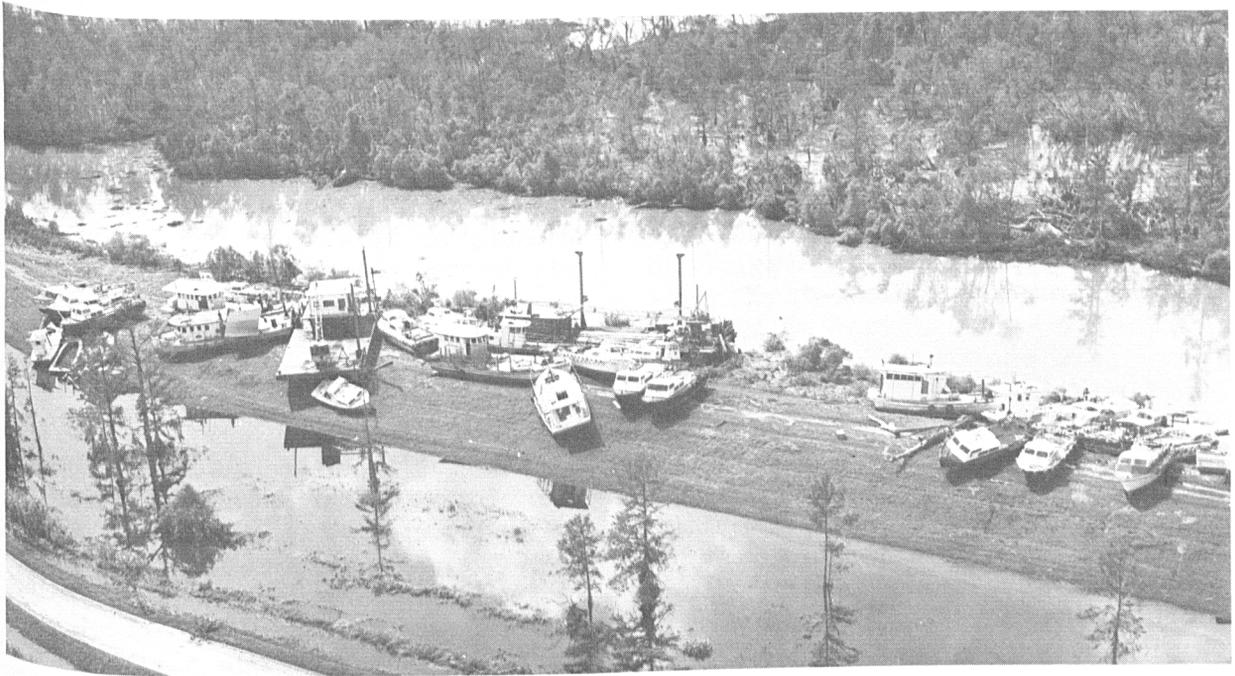
<u>Channel Mile-to-Mile</u>	<u>Depth of Shoaling, feet</u>
20-16	2
16-12	4
12-0	3
Seaward approach	5

The comparative surveys are presented graphically in Exhibit 45.

Dredging by the Corps to restore the MR-GO channel to the project depth of 36 feet and the gulfward approach channel to project depth of 38 feet is under way. Dredging to restore navigable depths in the entrance channels of



BOATS COULD BE FOUND JUST ABOUT ANYWHERE IN THE STORM AREA, INCLUDING PARKED AMONG THE TREES



CAMILLE HERDED SMALL BOATS ONTO THE LEVEES ...



AND RAN LARGER VESSELS AGROUND

the river passes was initiated on August 20 and completed on September 18.

Damage to marine interests was most severe in Plaquemines Parish where the total dollar damages amounted to \$3.4 million. Major losses in that parish resulted from the sinking of at least 1 tug, 6 barges, and 32 shallow-draft ves-

sels of various sizes. Nine large oceangoing vessels, including the Corps' hopper dredge Langfitt, were driven aground along the lower reaches of the Mississippi River. About 100 vessels, including crew-boats, barges, tugs, commercial fishing vessels, and petroleum supply boats, were removed from the west bank river and back levees.

FISH AND WILDLIFE

Fish and wildlife have long played an important part in Louisiana's economy. Storms of great magnitude invariably involve high mortality among various species, particularly oysters, shrimp, and fur-bearing animals. Furthermore, such storms generally produce ecological alterations which may have short- and long-term detrimental effects on estuarine productivity.

Hurricane Camille heavily damaged fish and wildlife resources in that part of the estuarine area of Louisiana lying east of the Mississippi River. Economic losses in this area, as estimated by the Corps, aggregated \$5.5 million. Of this total, more than 80 percent was attributable to damage to oyster bottoms, and approximately two-thirds, or \$3.7 million, occurred in St. Bernard Parish, while the remaining \$1.8 million occurred in Plaquemines Parish. The following paragraphs contain detailed information relative to the losses.

Hurricane Camille hit that portion of Louisiana's oyster bottoms in Plaquemines and St. Bernard Parishes which supplies most of the seed oysters needed for production along the coastal areas between the Mississippi and Atchafalaya Rivers. Following passage of Camille, investigation of these bottoms by personnel of the Louisiana Wildlife and Fisheries Commis-

sion indicated that many of the areas lying to the northeast of the MR-GO were covered, in varying degrees, by deposits of mud, silt, and marsh grass, all of which can be fatal to oyster life. These findings were erratic, however, for whereas siltation varied from 4 to 12 inches thick in some locations, in many areas the thickness was much less, and in other areas negligible deposit was noted. Testing revealed recently-dead oysters ranging from a negligible proportion to 95 percent of the oysters in a given area. It has been estimated that in this area damage was at the 50 percent level as a result of the overburden.

From the MR-GO southward to Bayou Terre aux Boeufs, there appears to have been relatively little damage as the extent of coverage by grass and mud was limited. Few recently-dead oysters were observed in this area.

Heavy coverage of marsh grass was observed in the general area of Plaquemines Parish lying below Bayou Terre aux Boeufs, chiefly in the marshes west of the larger lakes and bays. Some evidence of soft mud on the bottoms was also observed. Relatively few dead oysters were in evidence. Below the latitude of Black Bay and Bayou Lafourche, mud and grass overlays appeared less significant

than in the other areas examined.

Based on a comparison of oyster production in southeastern Louisiana over a period of years before and after Hurricane Betsy in 1965, the estimated loss to the oyster fishermen for reworking the beds, reduction in output over the next two years, and extra harvesting costs is \$4.5 million.

Debris was deposited by the storm in many of the traditional shrimping waters, thus reducing the harvest. Although juvenile shrimp usually experience considerable losses when exposed to severe hurricanes, catches of subadult shrimp subsequent to the storm have generally been good in size count and numbers. While it is believed that this potential setback will not substantially affect this year's production, a modest reduction in catches attended by increased operational costs will probably be experienced.

Several localized fish kills were reported in the aftermath of the storm; these were mainly attributed to fish trapped in the low-lying areas between the levees, and in some instances to reductions in dissolved oxygen induced by decomposition of windblown leaves and other organic materials. Overall fish kills appear minor when compared to the total fish population.

Other important wild game and fur-bearing animals in this region include nutria, muskrat, deer, and marsh rabbits. Due to the se-

verity of the winds and tidal overflow throughout the region combined with a lack of safe refuges, losses to these species were substantial.

The Chandeleur Island chain and Breton Island are important elements in the ecology of the Louisiana coastal area. An area about 50 miles long, averaging about 10 miles in width, which envelopes the islands, is designated as a Federal bird refuge. The refuge area has been proposed for designation as a National Wilderness Area under PL 88-577.

On the basis of aerial inspection and evaluation of available photographic coverage, it appears that the hurricane surge and attendant wave action significantly altered the configuration of some of the islands. Breton Island, in particular, appears to have been severely eroded with most of the sand beaches no longer in evidence. Data to identify, with any degree of specificity, the extent of erosion and its overall consequences, both short- and long-term, are not available. Based on observations subsequent to earlier hurricanes, it is unlikely that the erosion caused by Camille is likely to have any pronounced effects. However, in view of the relationship between the coastal ecology and these islands, there is a distinct possibility that serious erosion, such as appears to have occurred on Breton Island, could have material effects in the coastal area.

DAMAGES TO FLOOD PROTECTION STRUCTURES

Damages to flood protection structures within the flooded area were largely limited to Federal and local levees and drainage facilities. The Grand Prairie Levee on the east bank of the Mississippi River between Ostrica and Baptiste Collette Bayou, which was being re-

paired by the Corps under PL 99 after being heavily damaged in Hurricane Betsy, suffered extensive damage. A levee constructed by the Orleans Levee Board on the east bank of the river between Bohemia and Ostrica was also heavily damaged.



CAMILLE'S RELENTLESS SURGE ERODED GAPING HOLES IN THE BACK LEVEES IN PLAQUEMINES PARISH ...



AND EMERGENCY REPAIRS HAD TO BE MADE BEFORE STANDING FLOODWATERS COULD BE PUMPED OUT

As has been detailed elsewhere in the report, the main line river levee on the west bank was overtopped as far upstream as City Price and suffered substantial damage as a result. Similarly, the back levee system protecting west bank Plaquemines Parish was overtopped from Empire downstream, heavily damaged by erosion, and breached in many locations.

Slope paving, wavewash, and foreshore protection for the main-line river levees were heavily damaged. Tons of drift and debris were deposited on levees and had to be removed at substantial expense. All pumping stations below Empire in

Plaquemines Parish were inundated by the hurricane surge and suffered extensive damage.

A private levee system on the North Shore of Lake Pontchartrain near Slidell (Eden Isles) suffered minor damage when a small crevasse occurred shortly prior to a fall in the lake stages. No flooding of consequence occurred within the levee loop.

The total dollar damage to flood protection works in the overflowed area of Louisiana is estimated at \$3.5 million. Of this total, \$2.2 million represents damage to Federal flood control projects.

ESTIMATE OF STORM DAMAGES PREVENTED BY FEDERAL PROJECTS

Federal projects in the NOD which either prevented or reduced overflow of developed areas include the Lake Pontchartrain levee in Jefferson Parish, the Lake Pontchartrain and Vicinity, Louisiana, project, and the Mississippi River levees.

The Jefferson Parish levee prevented Lake Pontchartrain overflow from entering parts of east bank Jefferson Parish. It is estimated that, had the levee not been in place, damage would have been \$50 million.

The Lake Pontchartrain and Vicinity, Louisiana, project affects the parishes of Orleans, St. Tammany, St. John the Baptist, St. Charles, Livingston, Jefferson, and St. Bernard. The project was authorized in October 1965 and is under construction. Work done in connection with this project prevented the overtopping of levees along the north bank of the GIW and both banks of the IHNC. It is estimated that in the absence of this work, damages would have

amounted to \$90 million.

The Mississippi River levees on both banks were overtopped as far upstream as City Price. Above the latitude of City Price, the Phoenix to Bohemia levee loop on the east bank received very minor overtopping. Had that levee not been in place, damages would have amounted to an estimated \$5 million.

All protected areas on the west bank of the river downstream from City Price were inundated to some extent, although flooding above Port Sulphur was of little significance. The severity of damage below Buras, where the river levee was overtopped by as much as 7.5 feet, was much greater than that above Buras. Had the river levee not been in place, it is probable that the severity of damage in both areas would have been comparable. On this basis, additional damages in the protected areas on the west bank would have amounted to an estimated \$35 million.

Based on the above, the total damage prevented by Federal projects

which were in place or under construction is estimated to be \$180 million.

The Lake Pontchartrain and Vicinity, Louisiana, project previously referred to is in the early stages of completion. Had it been completed, damages which occurred in Venetian Isles, north of U. S. Highway 90, and in unprotected areas on the shore of Lake Pontchartrain would have been significantly reduced. The overall reduc-

tion in damages is estimated at \$1.5 million.

The passage of Hurricanes Betsy and Camille has served to stress the need for raising the Mississippi River levees to ensure adequate protection for the areas included in the New Orleans to Venice, Louisiana, project. Studies to determine the construction costs, benefits, cost sharing, and related matters involved in raising those levees are under way.

DAMAGE SUMMARY

Total economic damages within the area of overflow in the NOD, from all causes attributable to Hurricane Camille, amounted to approximately \$198.7 million. This total is comprised

of \$123.6 million to fixed property, \$30.9 million to movable property, and \$44.2 million of other losses. A summary of overall damages is presented in Tables 27 and 28.

STORM CASUALTIES

While casualties from Camille did not approach those of such killer storms as that which

hit Galveston, Texas, in 1900 (6,000 dead) or Hurricane Flora, which hit Haiti and Cuba in 1963

TABLE 27

SUMMARY OF TOTAL ESTIMATED DAMAGES^a BY PARISH

Parish	(Damages in Thousands of Dollars)			Total Damages
	Damage to Fixed Property	Damage to Movable Property	Other Losses	
	\$	\$	\$	\$
Plaquemines	115,531.0	27,341.0	35,006.0	177,878.0
St. Bernard	1,331.0	353.0	4,462.0	6,146.0
Orleans	4,902.0	2,019.0	2,869.0	9,790.0
St. Tammany	1,817.0	1,252.0	1,857.0	4,926.0
TOTAL DAMAGES	123,581.0	30,965.0	44,194.0	198,740.0

^a In the flooded area only.

TABLE 28

SUMMARY OF TOTAL ESTIMATED DAMAGES^a BY CATEGORIES

Category	(Damages in Thousands of Dollars)			
	Damage to	Damage to	Other	Total
	Fixed Property	Movable Property	Losses	Damages
	\$	\$	\$	\$
Residential	30,762.0	13,851.0	426.0	45,039.0
Mobile Homes	4,037.0	2,354.0	90.0	6,481.0
Commercial	5,132.0	5,684.0	9,060.0	19,876.0
Agriculture	1,110.0	634.0	1,186.0	2,930.0
Industrial, Nonpetroleum	1,752.0	690.0	1,824.0	4,266.0
Industrial, Petroleum	57,900.0	3,750.0	9,550.0	71,200.0
Marine	115.0	1,996.0	1,826.0	3,937.0
Transportation	945.0	410.0	329.0	1,684.0
Utilities	6,041.0	0.0	2,475.0	8,516.0
Governmental	10,743.0	852.0	7,581.0	19,176.0
Schools	4,446.0	567.0	119.0	5,132.0
Churches	598.0	177.0	0.0	775.0
Fish and Wildlife	0.0	0.0	5,500.0	5,500.0
Other Losses	0.0	0.0	4,228.0	4,228.0
TOTAL DAMAGES	123,581.0	30,965.0	44,194.0	198,740.0

^a In the flooded area only.

(9,000 dead), the list of casualties is, nonetheless, formidable. As of March 1, 1970, a total of 262 deaths had been recorded in the states of Louisiana, Mississippi, West Virginia, and Virginia. The number of families left homeless totaled over 21,000.

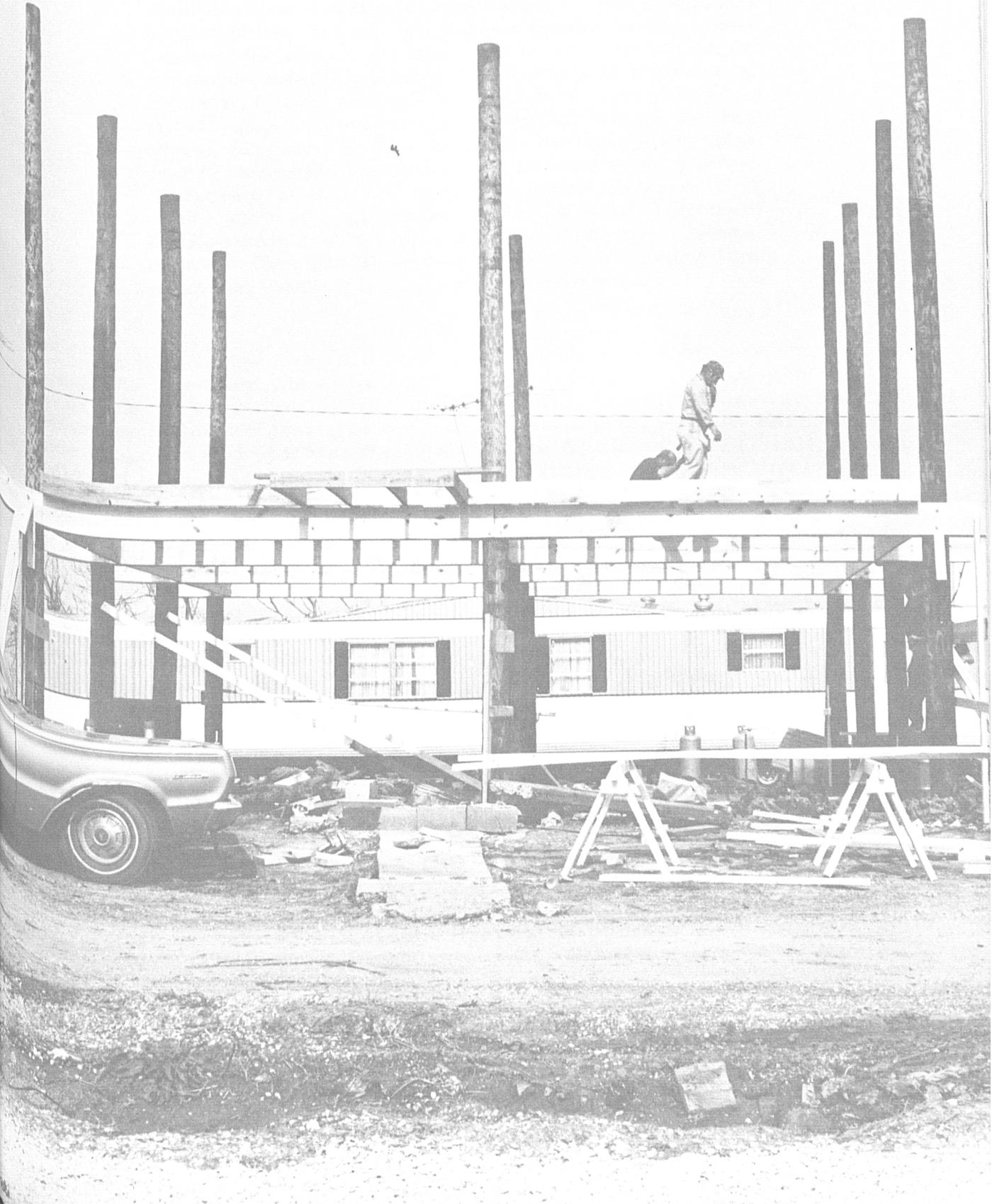
The toll in Mississippi, where 137 died, exceeded that in Louisiana, West Virginia, and Virginia. Ironically, the second heaviest toll, 114 dead was recorded in Virginia, after Camille was no longer a hurricane

and the element of a tidal surge was not a factor.

Plaquemines Parish, which experienced devastation equal to any along Camille's track, accounted for seven of Louisiana's nine dead. This relatively small total attests to the effectiveness of prestorm evacuation in Plaquemines Parish; and comparison with the dreadful toll in coastal Mississippi suggests the overriding importance of evacuating areas of high vulnerability in advance of the storm.

Section VIII

REHABILITATION



SECTION VIII REHABILITATION

Rehabilitation of storm-ravaged areas is a complex process influenced by many factors. Federal, State, and local agencies and other governmental bodies play varying roles, many of which are intermingled and interdependent. Rebuilding of an area requires debris cleanup, restoration of basic services, jobs for displaced storm victims, and money, equipment, and materials for rebuilding homes and businesses. Plans must be made for orderly development and people must be assured that appropriate steps are being taken to prevent reoccurrence of such a disaster. A complete discussion of all of the activities of all agencies contributing to rehabilitation of Camille-stricken areas is beyond the scope of this report, however, the more salient activities of the major agencies contributing to recovery from Camille in Louisiana are summarized herein.

As part of the Executive Office of the President, the Office of Emergency Preparedness (OEP) administers Federal disaster assistance programs and operates through State and local governments to coordinate the activities of Federal agencies. Following Camille, OEP has functioned through Public Laws 79 and 875. Under PL 875 OEP is authorized, in case of a disaster, to undertake removal of debris; protective, health, and sanitation measures; provision of temporary housing or emergency shelter; and emergency repairs and temporary replacement of streets, roads, bridges, dikes, levees, drainage facilities, public buildings and equipment, and public utilities. About 50 percent of this work has been performed for OEP by the Department of Housing and Urban Development (HUD), about 20 percent by the Corps, and about 30 percent by a variety of Federal, State, and local governmental bodies, agencies, or institutions. Expenditures through OEP under PL 875 are expected to be about \$13,000,000.

The second law under which OEP has been operating is PL 79, a newly enacted law which authorizes

unemployment compensation, highway repair, liberalization of loans (through the Small Business Administration (SBA) and the Farmer's Home Administration (FHA)), certain grant relief to the timber industry, debris removal from private property, food assistance and temporary housing. The largest expenditure under PL 79 has been for unemployment compensation. It is estimated that in Louisiana approximately \$2,000,000 will be expended on this program for people who are out of work because of Camille, and not covered by existing compensation programs. Another \$1,000,000 of funds authorized by PL 79 is expected to be used for removal of debris and damaged timber from private property.

In addition to its coordination of Hurricane Camille disaster relief, OEP has undertaken two studies, one a short-range study dealing with ways to improve the immediate Federal response to a large-scale disaster and the other, a long-range review of the recovery and rehabilitation problem.

Much of the work done by the Corps for rehabilitation is simply an extension of the activities

performed as emergency operations. Temporary protective measures such as closing of breaches in levees are being followed up by rebuilding and strengthening of levees. Removal of debris has been extended beyond the clearing of streets and public lands to the clearing of private lands.

The Corps performs work both for the OEP and under its own authorities. Many emergency operations such as clearing debris, repairing dikes and levees, and draining floodwaters were performed by the Corps for OEP under PL 875. Using this same authority, the Corps began its rehabilitation efforts by returning salvable homes to their foundations. A total of 379 homes will have been returned to their original locations at a cost of

about \$400,000.

In January plans were set into motion for the Corps and U. S. Department of Agriculture to remove debris from private property. Most of this work will be done by the Corps for OEP under PL 79. The Corps will handle the largest portion of the more than 1400 requests for this assistance. Anticipated expenditures under this program, which is expected to be completed by the end of August, are \$1,000,000.

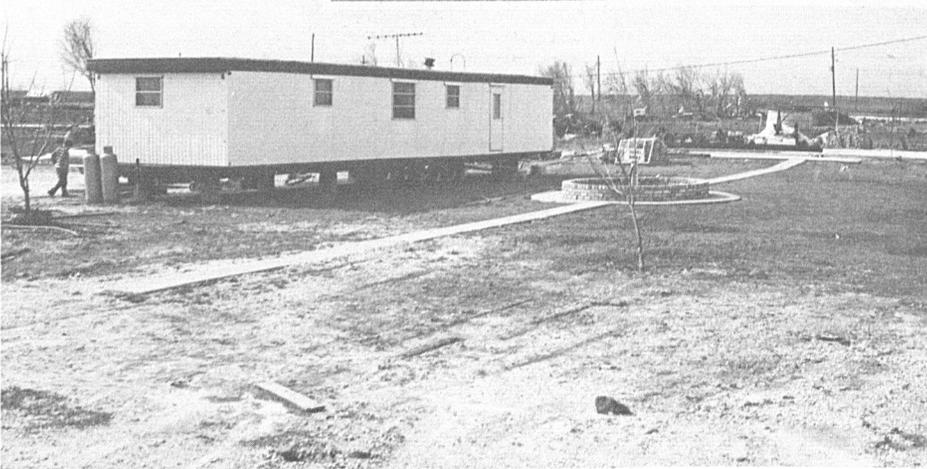
It is estimated that the Corps will do about \$8,668,000 worth of work. Under its own authorities, PL 99 and General Operations and Maintenance (O&M General), repairs to the Langfitt Dock and Venice suboffice have already been made at a cost of \$82,000. Back levees in Plaquemines Parish have been



TRAILERS, NEW STORAGE TANKS, AND SCATTERED CONSTRUCTION REFLECT THE RETURN TO NORMALCY IN PLAQUEMINES PARISH



TRAILERS, SOME IN SUBDIVISIONS, OTHERS IN SPECIALLY-PREPARED SITES, HAVE BECOME A SIGN OF DETERMINATION—DETERMINATION TO REBUILD LOWER PLAQUEMINES PARISH



MANY PEOPLE IN PLAQUEMINES PARISH ARE RETURNING TO REPAIR OR REBUILD THEIR HOMES. TYPICAL OF CAMILLE-STRICKEN AREAS IS A TRAILER IN FRONT OF A DAMAGED HOME OR NEXT TO A VACANT FOUNDATION

rebuilt and strengthened at a cost of \$480,000. Dredging of shoals is under way and repair of jetties and dikes is complete. Estimated cost of these operations is \$5,000,000. Temporary repairs were made to Mississippi River levees and permanent repairs are now under way. Cost of this work is estimated at \$3,090,000.

Responsibility for temporary housing was delegated to HUD by OEP. On Friday, August 22, within an hour after HUD received the authority, mobile homes were ordered and within one week, victims of Camille were moving into their new homes. Since August, 1,739 of the trailers leased by HUD have been furnished to Louisiana and 3,338 trailers have been furnished to Mississippi.

There is no rental fee for these trailers for the balance of the first month in which they are occupied plus an additional 3 months. From the rent-free term until one year from the date of the disaster, monthly rental varies from \$35 to \$50 depending on the size of the trailer. Adjustments can be made in the rental fee if a hardship is involved. Since HUD cannot, according to its present contract, extend the trailer lease beyond one year, any negotiations for the trailer after that period are between the occupant of the trailer and its owner. Total cost of temporary housing, including site preparation, is expected to be about \$6,750,000.

FHA and the Veterans Administration (VA) were two other agencies which helped meet the housing problem. Several hundred homes were rented by the two agencies to disaster victims for \$1 a month.

The Department of Labor in cooperation with the Louisiana State Employment Service is administering the unemployment compensation program which was authorized by

PL 79. This compensation is for those who are out of work because of Camille, but who are not covered by existing unemployment compensation programs. Compensation, which averages \$41 per week, is based on previous salary and may be drawn for 28 weeks.

Although there were more than 1,700 claimants from Plaquemines Parish, job placements ran about normal since most affected workers were fishermen who simply received compensation until the waters cleared and then went back to work. The State as a whole had more than 3,000 claimants under this program for which expenditures will total about \$2,000,000.

Assistance of SBA is critical to rehabilitation of disaster-torn areas. Reopening of businesses and rebuilding of homes is dependent on the availability of money. Loans from SBA may be obtained by individuals, business concerns, privately owned hospitals, colleges, universities and schools, and non-profit organizations such as churches and charitable institutions. Terms of the loan vary with circumstances, but are generally for a maximum of 30 years at 3 percent a year on the SBA share of the loan.

On August 18, through the emergency statutes available to SBA, portions of the 4 states which were damaged by Camille were declared as loan areas. Offices in Slidell, New Orleans, and Happy Jack handled loans in Louisiana. The Slidell office closed October 10 after processing 165 home loans and 26 business loans at a total value of \$837,400. As of February 18, the New Orleans office was still open and had processed 530 home loans and 67 business loans having a total value of \$6,892,956. The Happy Jack office, also still open, had processed 1,832 home loans and 68 business loans with a total value of \$19,927,950.

In all, 5,625 applications for loans have been issued and about 3,100 loans are expected to be consummated. Loans through SBA are expected to total \$35 to \$40 million in Louisiana as a result of Camille.

Since Camille, the Office of Education (OE), which is a part of the Department of Health, Education and Welfare (HEW), has been concerned with the restoration of schools and related buildings. Approximately 95 percent of the repair of school building damage in Plaquemines Parish will be financed by HEW. Effort will be made to raise school buildings above the 100-year flood elevation where economically feasible.

Minor repairs to the Sunrise school have already been made. The Buras school, teachers' apartments, and principal's home received considerable damage, but the anticipated completion date of these repairs is not available. The Pilot-town school and teachers' apartments are being repaired but, again, the completion date of these repairs has not been established.

The Boothville school is a 2-story building that survived in one of the areas worst hit by Camille. Rehabilitation of this school will involve leaving the first floor vacant and adding a third floor. The gymnasium will be salvaged, but all electrical conduits will be placed above flood level. Principal's quarters and teachers' apartments will be rebuilt on pilings.

A representative of OE also stated that after Camille, teachers from lower Plaquemines were transferred to other schools, but now demand for teachers has made it necessary to begin recruiting.

Other organizations participating in rehabilitation of Camille-ravaged areas were the Salvation Army and the Red Cross. In Plaquemines Parish, the Salvation Army was still supplying clothing to

school children in February. Over \$10,000 was expected to be spent on this program. Projected costs of various other services, such as family and canteen services, is \$131,400. This cost does not include the value of clothing and other articles donated, nor the time spent by volunteers.

Along with its immediate response to the emergency needs of Camille victims for such things as food and shelter, the Red Cross has been active in meeting the long-term recovery needs of those in the storm-torn areas. Assistance is given to families who lack the credit or other resources to finance their own recovery. Owner-occupied homes are rebuilt or repaired and refurnished. Occupational tools and other equipment are replaced. Nursing, medical care, and normal living expenses are furnished until homes and means of livelihood can be reestablished.

In Louisiana, the Red Cross has assisted about 3,300 families over a 5-parish area at a cost of nearly \$3,000,000. In Mississippi more than 8,000 families have received Red Cross assistance at a cost of nearly \$13,000,000. Along with its other rehabilitation work, the Red Cross also furnished building materials for 40 homes which the Louisiana AFL-CIO built free of charge. 1,000 skilled union craftsmen spent six consecutive weekends building these homes.

In Plaquemines Parish, the intensity of damage from Camille was equal to that along the Mississippi Gulf Coast. Extensive damage, amounting to total destruction in some areas, occurred from Venice to Port Sulphur, a total of about 29 miles. Through the efforts of numerous Federal and State agencies, and public and private organizations, and especially through the determination of the people of Plaquemines and the efforts of their



A MODEL HOME BUILT BY THE PLAQUEMINES PARISH COMMISSION COUNCIL GRAPHICALLY ILLUSTRATES THE NEW BUILDING CODE WHICH IS DESIGNED TO PREVENT MUCH STORM-RELATED DAMAGE

governmental bodies, the Parish is well on its way back to normalcy. Land use studies, more rigid zoning laws, and newly planned construction promise an even better place to live than before.

Within 4 months after Camille, 4,962 students were back in Plaquemines Parish public schools, just 138 less than before the storm. Until the Buras High School is restored, students from the lower west bank will be accommodated at the Sunrise High School. Parochial and private schools in Plaquemines, including Delta Heritage Academy, will also be open to students in the near future. For college students, the Parish Commission Council is offering a \$200 scholarship grant to students from Camille-stricken families. This is in addition to the Parish Scholarship offered to all college students of the Parish each year.

From September 1969 through February 1970, 823 construction permits valued at about \$9,665,000 were issued for new construction, repairs, additions, and relocations. About \$4,490,000 or 46.5 percent of

the total value of the permits is for residential construction. These figures do not include temporary house trailers or portable office buildings for which over \$5,000,000 worth of construction permits have been issued. Permits for school and church construction and repairs total about \$1,172,000 for this same period.

About 40 parish-owned vehicles including cars for the sheriff's office, trucks, draglines, fire trucks, and garbage trucks and tractors were replaced within 4 months after the storm. A jet helicopter was added to the parish resources for recovery work. The Buras Library and the Boothville-Venice fire station have been repaired. And for those in the citrus industry, the parish will give one free tree to growers for each tree they buy.

Drainage and water distribution and sewerage systems have been repaired and extension of the water distribution system, including a 500,000-gallon elevated water tank near Port Sulphur, is now under way on the west bank of lower Plaquemines. Also two new drainage

pumping stations are under construction on the east bank.

Streets are being paved in several of the urban centers on the west bank and repair of the new 4-lane highway in Boothville-Venice area has begun. Plans are being made for construction of a new levee road between Boothville and Venice.

New zoning laws are of particular importance in this area. Since much storm damage can be eliminated through appropriate construction, the Plaquemines Parish Commission Council has adopted a new parish-wide building code. Homes may no longer have gable roofs and structure and foundation must be tied together with special reinforcing. The revised building code includes many additional restrictions relating to wind resistant construction.

A hurricane zone has been established within the protection of the levees from Fort Jackson to Venice and outside the levees in the Venice area. In this area, except in hardship cases, homes must be built 10 feet aboveground on pilings which tie into the roof. Parish residents are to be given financial help for foundations built according to the new restrictions.

One of the most important aspects of the recovery operations in Plaquemines Parish is a land use study which is being conducted jointly by the Louisiana Department of Public Works (DPW), HUD, and the Parish. Through this study, the essentials of planned development including land use, major thoroughfares, community facilities, drainage and utilities, and other public improvements will be applied to recovery operations following the devastation by Camille. Data gathered

for the immediate recovery operations will be combined with further studies and used in long-range development of the parish.

The land use study will be financed primarily by HUD but the Parish will pay 1/6 of the costs. The DPW will act as the contracting agency. Studies to be made are:

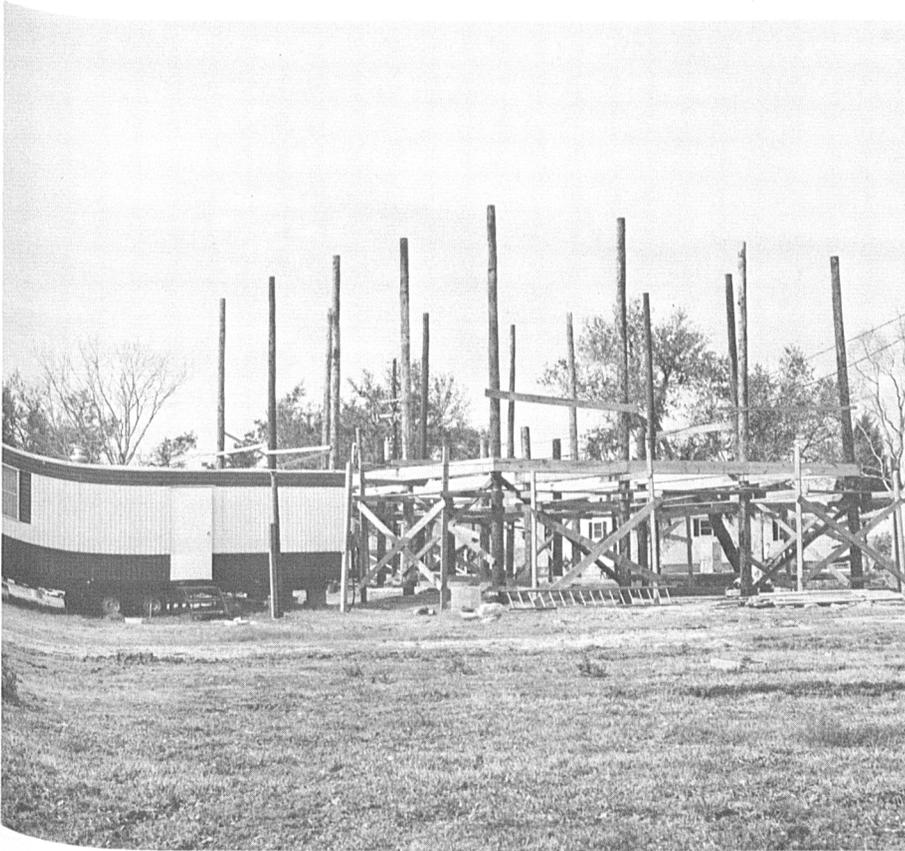
- a. Population and Economic Study
- b. Existing Land Use Survey and Projected Land Use Plan
- c. Community Facilities Plan
- d. Major Thoroughfare Plan
- e. Drainage and Utilities Survey
- f. Subdivision Regulations
- g. Zoning Ordinance
- h. Public Improvement Program and Capital Improvement Budget

The entire program will take an estimated 30 months to complete.

In addition to its work with the land use studies, the DPW has acted in an advisory capacity and furnished technical assistance to OEP, Levee Boards, Civil Defense, and other local and Federal agencies.

Much damage was done by Camille to the oyster industry. On October 17, under PL 309, \$176,388 was approved for rehabilitation of natural oyster seedbeds. About 30,000 cubic yards of large clamshells were planted over one-square-mile areas at Three Mile Pass and Black Bay. These plantings were completed November 15 with hopes that the beds would be ready for harvest in September 1970. However, present indications are that these plantings will not be available for harvest until September 1971.

A NUMBER OF NEW HOMES BUILT ACCORDING TO THE NEW BUILDING RESTRICTIONS
ARE ALREADY GOING UP IN PLAQUEMINES



THE PILINGS ON THIS HOUSE
WILL TIE INTO THE ROOF

NOTE THE PROTRUDING
STEEL STRIPS WHICH TIE
TOGETHER THE WALLS
AND SILLS



Section IX

NOTABLE ASPECTS



SECTION IX NOTABLE ASPECTS

Each hurricane is, in itself, a unique occurrence, unlike, in many substantive aspects, any which have preceded it. Hence, the cataloging of those aspects of Hurricane Camille which distinguish it from other hurricanes of record would likely be an endless task. Camille, however, was distinctive in a number of significant ways which deserve special mention.

THE HURRICANE

As previously pointed out, Camille was a unique hurricane insofar as the meteorological parameters of central pressure and wind speed are concerned. The area of hurricane display was likewise unique in its compactness. The hurricane eye was less than 5 miles in diameter, and, as Camille came ashore, with top winds of 201.5 miles per hour (mph), hurricane force winds extended outward from her calm center by a maximum of some 60 miles. By way of comparison, when Betsy made landfall with top winds of less than 175 mph, winds of hurricane force extended outward from the center by nearly 110 miles.

While the depth of Camille's central pressure has been noted, its implications are worth exploring further. Although the hurricane of September 2, 1935, did produce a slightly lower central pressure—26.35 inches

of mercury while passing over the Florida Keys—this pressure was recorded at 24.80 degrees north latitude. The approximate minimum barometric pressure estimated to be possible at this latitude is 26.00 inches.

For 30 degrees north latitude, which is very nearly the latitude of Camille's landfall, the estimated minimum possible barometric pressure is 26.90 inches. According to a barometric reading taken by a local resident near the eastern edge of the storm's eye wall, Camille's lowest pressure at landfall was 26.85 inches. Thus, while the minimum pressure recorded for the 1935 hurricane was 0.35 inch higher than the minimum considered possible, Camille's minimum pressure at landfall was actually 0.05 inch lower than what had previously been considered possible.

THE DAMAGES

Insofar as any discussion of damages within the New Orleans District area of overflow is concerned, the foci of interest must clearly be on Plaquemines Parish and a comparison of Camille's effects on this parish with those of her predecessor Betsy.

Betsy's track, it will be re-

membered, took her west of Plaquemines Parish, placing the parish within the right semicircle of generally more severe hurricane display. As the hurricane moved inland to the northwest, the hurricane surge in Breton Sound swept westward, overtopping the Mississippi River levees on both banks for more



DESPITE THE CHAOS WROUGHT BY CAMILLE...

PEOPLE FOUND TIME TO REFLECT ON THE
ODD SIGHTS BROUGHT BY THE STORM...



AND CAMILLE'S VICTIMS, FREQUENTLY WITH LITTLE ELSE, RETAINED A SENSE OF HUMOR

than 50 miles upriver. The back levees west of the river were not overtopped, and these levees were subsequently breached at selected locations to expedite removal of floodwaters which had ponded in the protected areas between the two levees.

Unlike Betsy, Camille's track was east of Plaquemines Parish, directly across Breton Sound. The northwest-southeast orientation of the parish, combined with the hurricane track in effect "aimed" the surge at that portion of the parish most exposed to open waters. The result was overtopping of the river levees again, this time for some 45 miles upriver.

The highest elevations reached by the two surges were not greatly different—17 feet for Betsy and about 16 feet for Camille. Unlike the surge that overtopped the river levees in Hurricane Betsy, which crested some 70 miles upriver, Camille's surge

reached its highest point less than 12 miles upriver. Since the levees become progressively lower moving downriver, the depth of overtopping incident to the passage of Camille was substantially greater than that during Hurricane Betsy. The back levees, whose integrity had remained intact through Hurricane Betsy, were overtopped as far upriver as Empire and the severity of damages in the protected areas downriver from Empire was far greater than that resulting from Hurricane Betsy.

Considering the severity of damage in Plaquemines Parish, it is, perhaps, gratuitous to observe that the situation could have been worse. Yet, minor westward translation of the hurricane track would have intensified the attack on Plaquemines Parish by increasing the force of the winds driving across the most exposed protected areas and the open water immediately adjacent to them.

THE RESPONSE

While much can properly be said about the effectiveness of pre-storm preparations and poststorm operations, the effectiveness of evacuation in Plaquemines Parish is worthy of special note. Despite a

position of great vulnerability, flooding up to depths of 16 feet over the ground, and total destruction of large areas, the death toll in the parish represented less than 3 percent of the total deaths.

POSTSTORM SCENES IN THE FLOODED AREA REFLECTED . . .

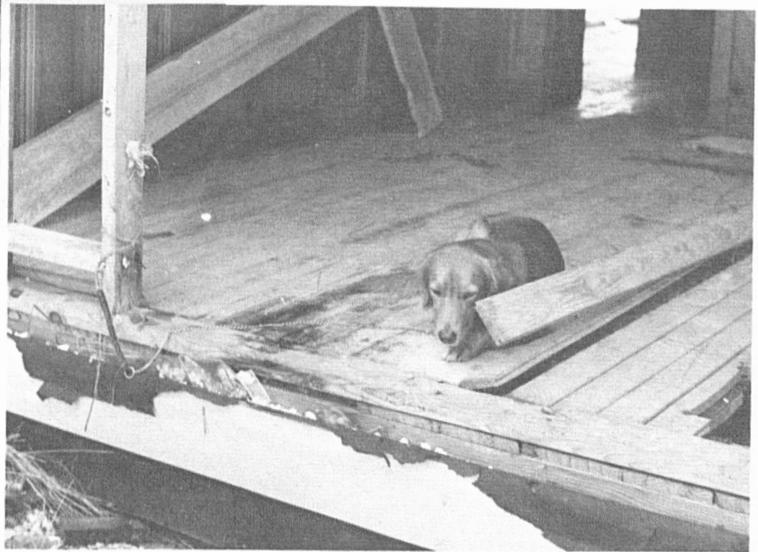
DESOLATION . . .





Photograph by Terry Friedman

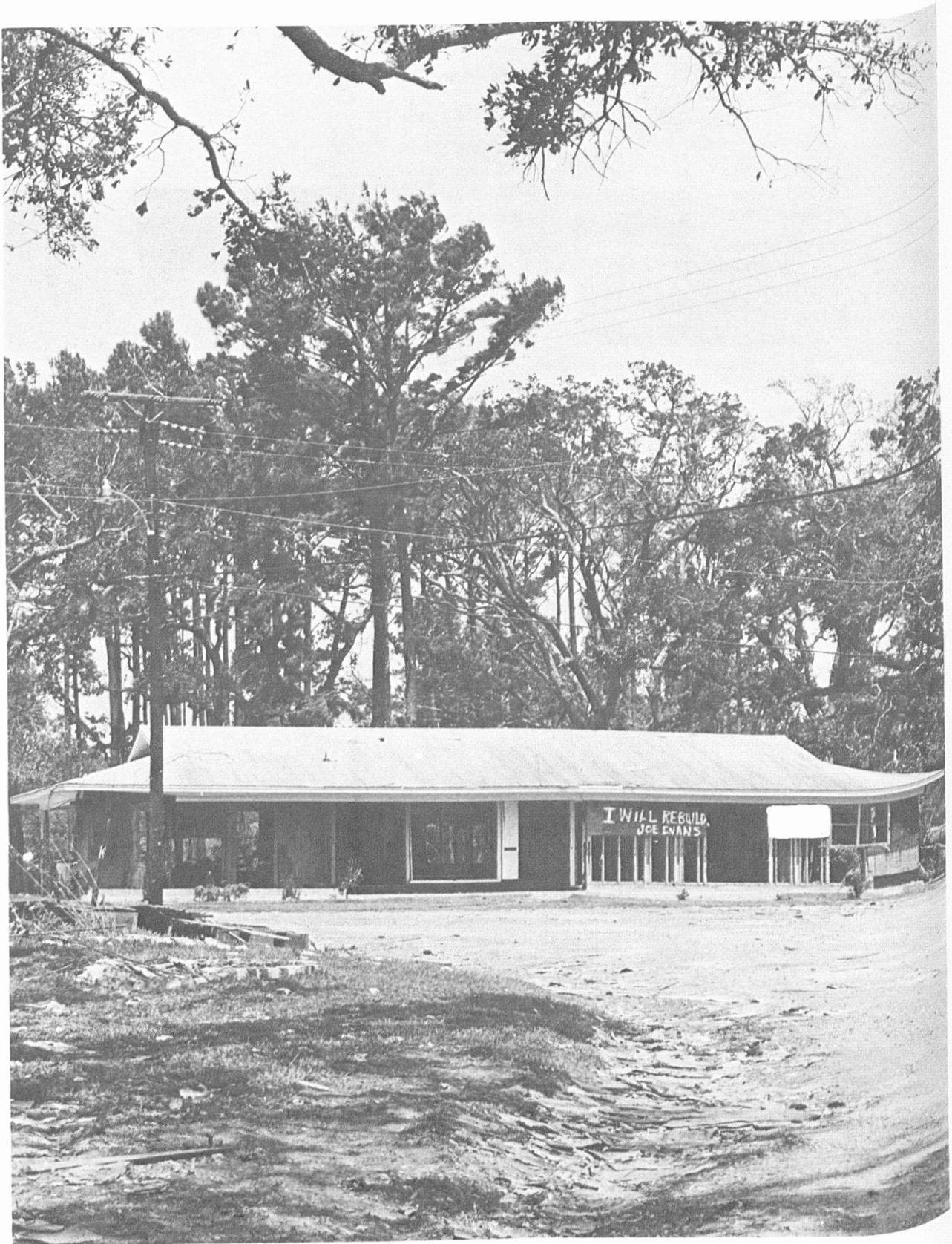
POIGNANCY . . .



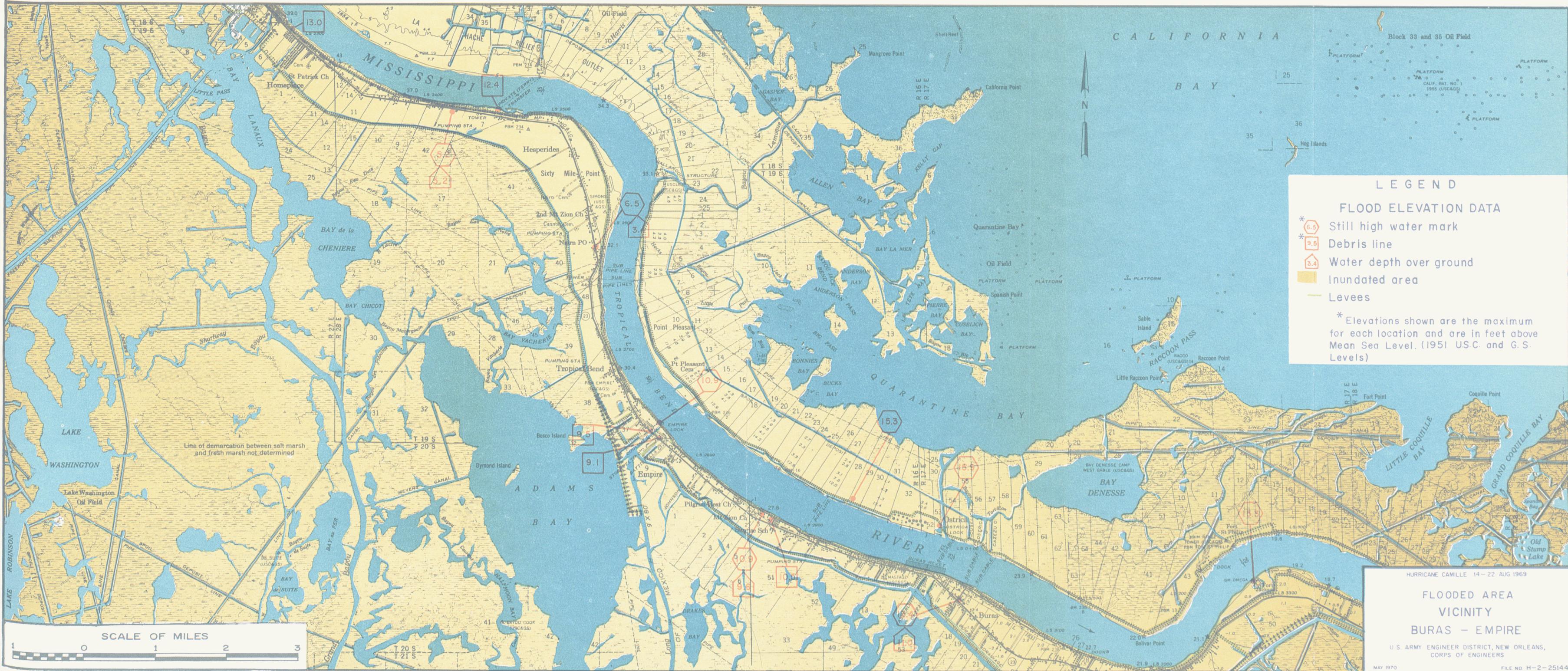
Photograph by Terry Friedman

FUTILITY . . .

...AND HOPE



EXHIBITS



LEGEND

FLOOD ELEVATION DATA

- * 6.5 Still high water mark
- * 9.6 Debris line
- * 5.4 Water depth over ground
- Inundated area
- Levees

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. and G.S. Levels)

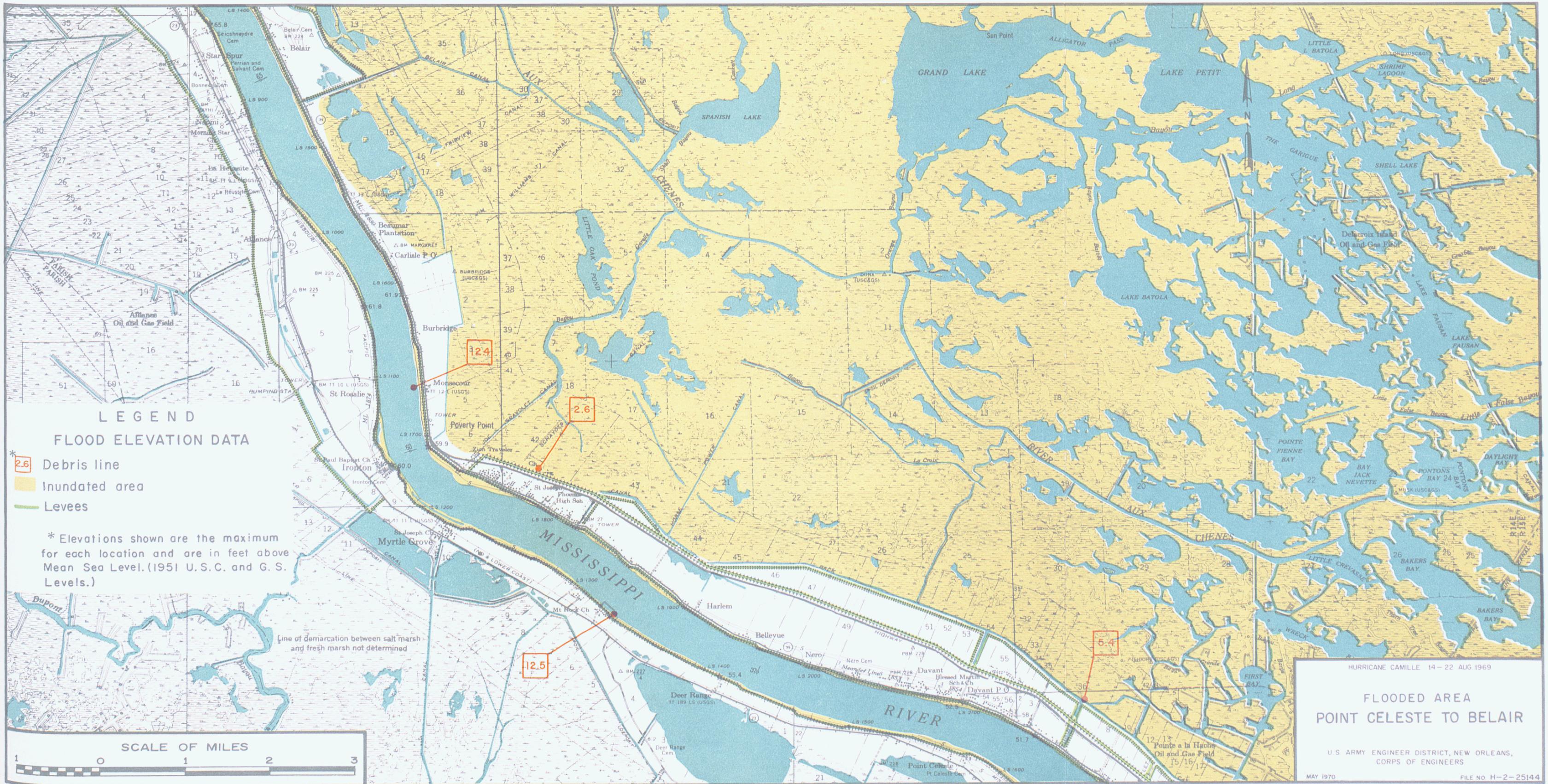
HURRICANE CAMILLE 14-22 AUG 1969

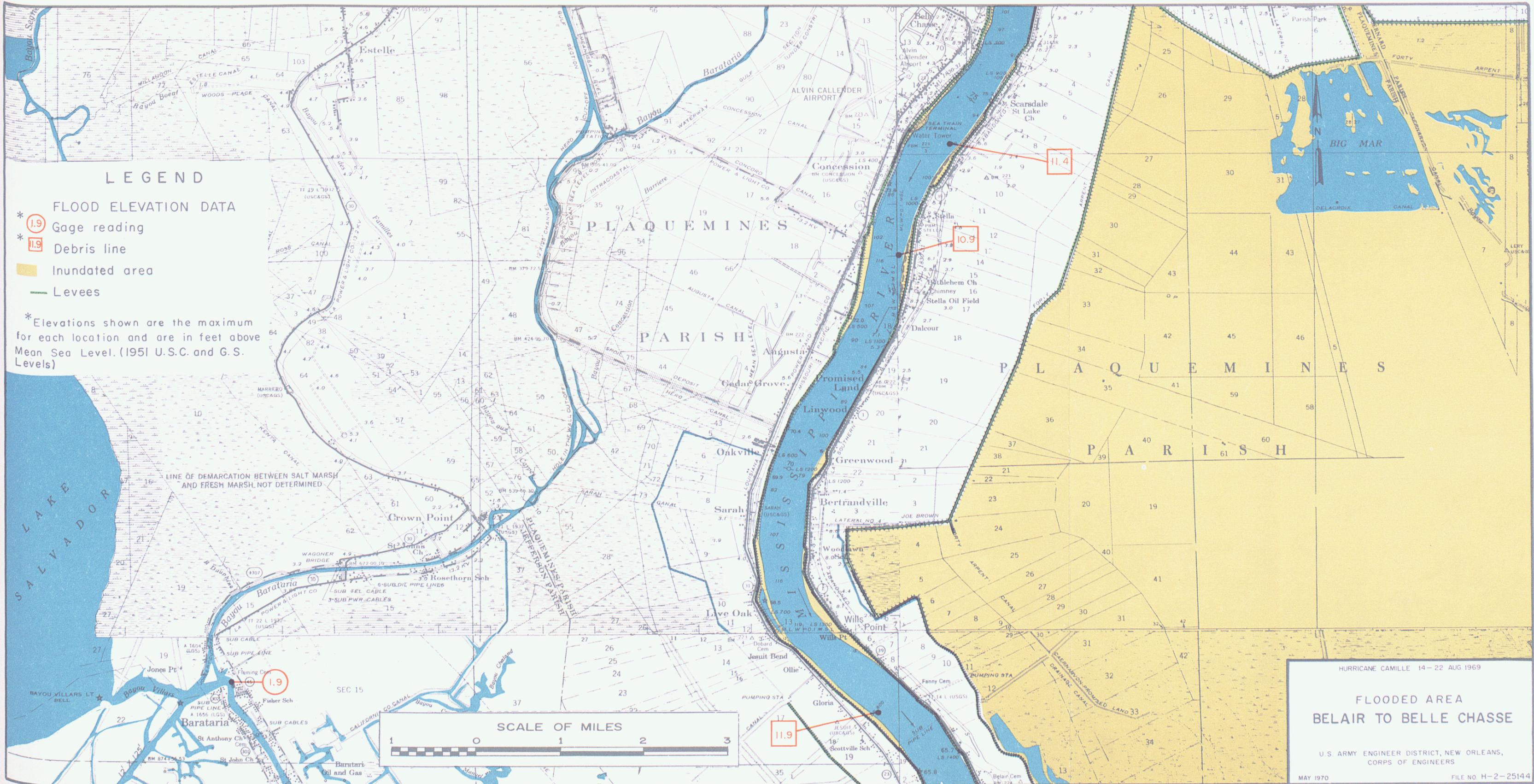
FLOODED AREA VICINITY BURAS - EMPIRE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144







LEGEND

FLOOD ELEVATION DATA

- * 1.9 Gage reading
- * 11.9 Debris line
- Inundated area
- Levees

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. and G.S. Levels)

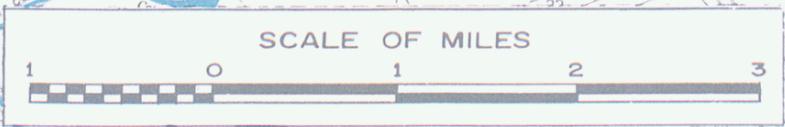
HURRICANE CAMILLE 14-22 AUG 1969

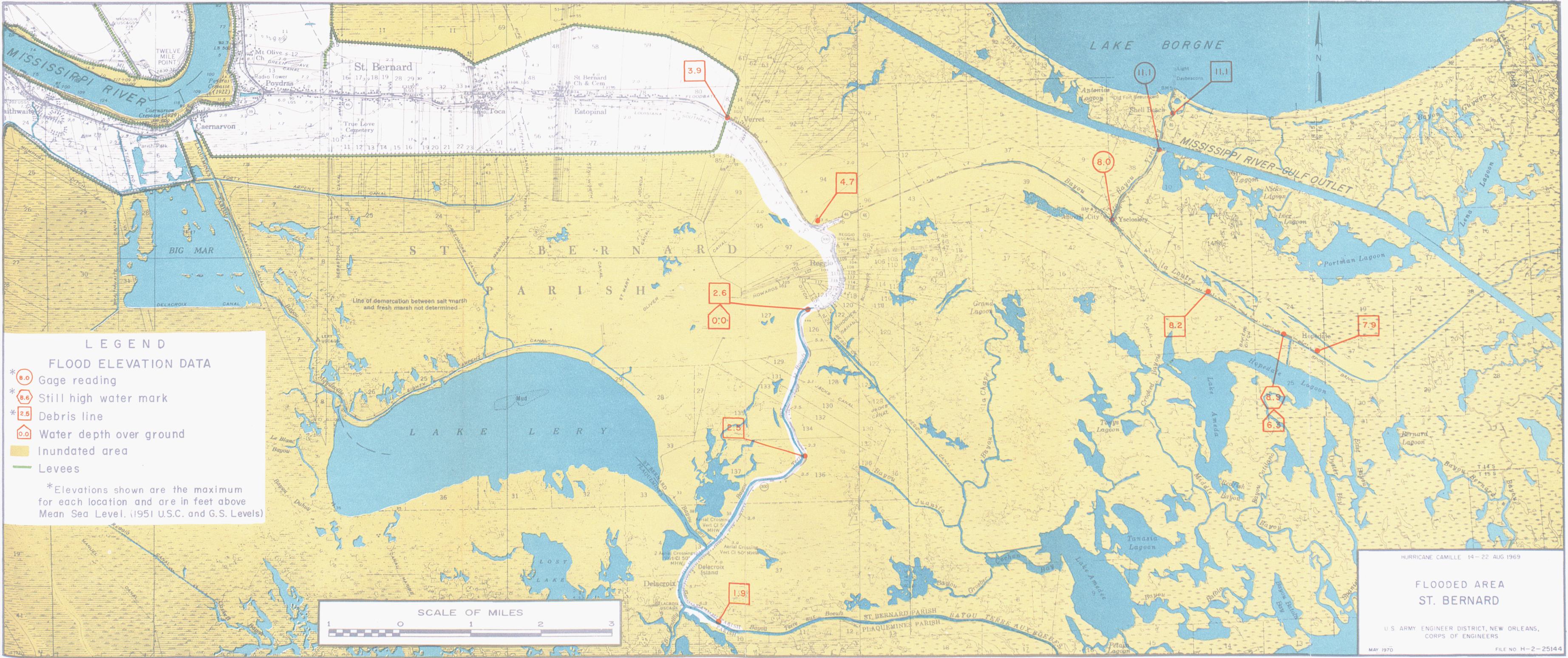
**FLOODED AREA
BELAIR TO BELLE CHASSE**

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



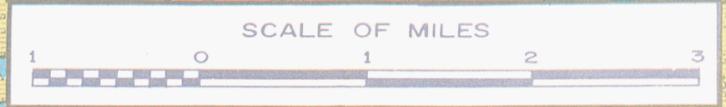


LEGEND

FLOOD ELEVATION DATA

- * 8.0 Gage reading
- * 8.6 Still high water mark
- * 2.5 Debris line
- 0.0 Water depth over ground
- Inundated area
- Levees

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. and G.S. Levels)

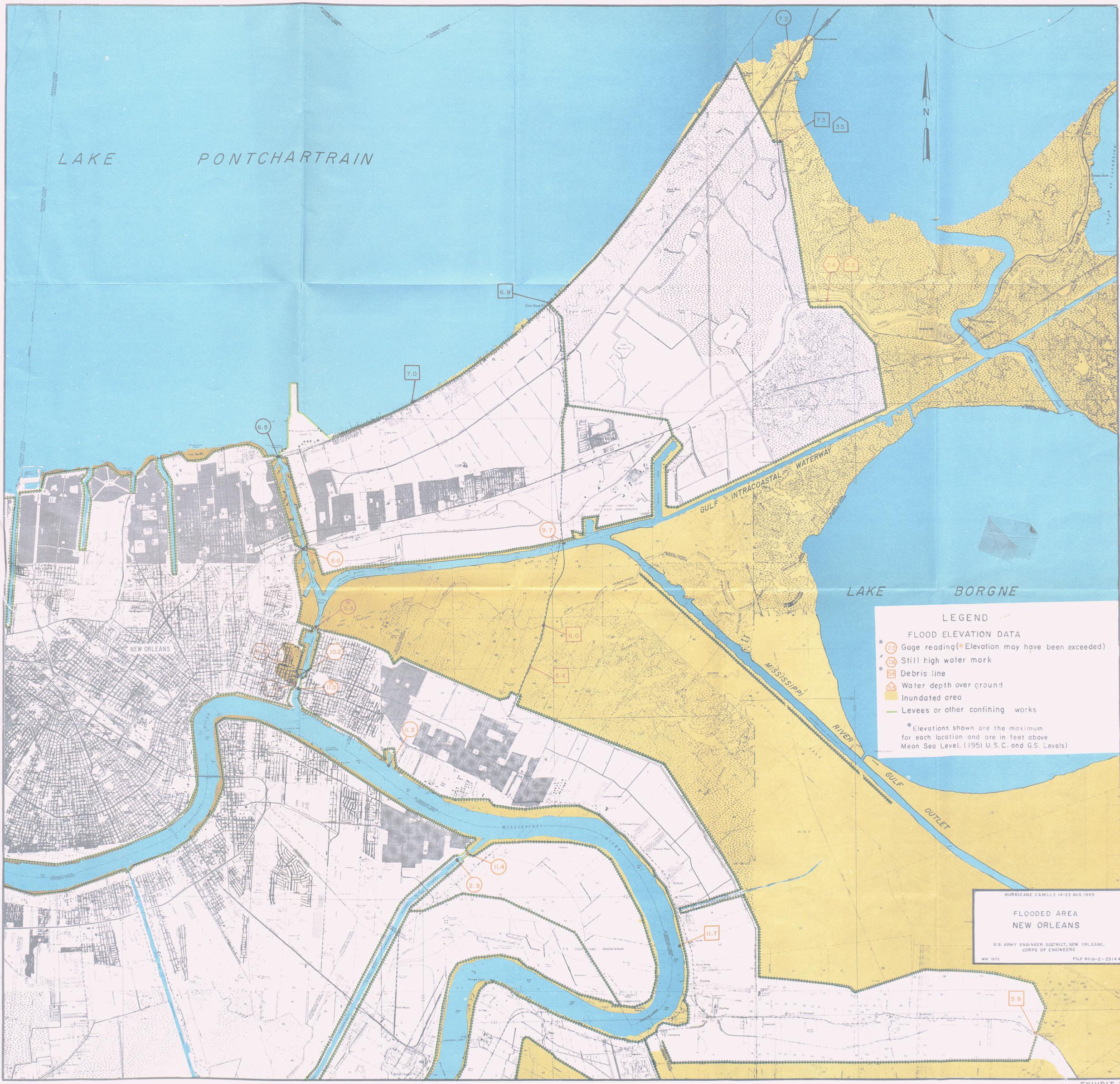


HURRICANE CAMILLE 14-22 AUG 1969

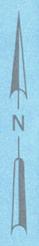
**FLOODED AREA
ST. BERNARD**

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO H-2-25144



LAKE PONTCHARTRAIN



LAKE BORGNE

NEW ORLEANS

GULF INTRACOASTAL WATERWAY

MISSISSIPPI RIVER

LEGEND

FLOOD ELEVATION DATA

- * (7.9) Gage reading (#Elevation may have been exceeded)
- * (7.6) Still high water mark
- * (5.4) Debris line
- (3.5) Water depth over ground
- Inundated area
- Levees or other confining works

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. and G.S. Levels)

HURRICANE CAMILLE 14-22 AUG. 1969

**FLOODED AREA
NEW ORLEANS**

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144

3.9



LEGEND

FLOOD ELEVATION DATA

- * 9.0 Gage reading
- * 9.9 Still high water mark
- * 7.0 Debris line
- Inundated area in New Orleans District only

Additional information concerning the effects of this storm in Mobile District is contained in their report, "Hurricane Camille, 14-22 August 1969." See Plate 1 for areas surveyed in both districts.

* Elevations shown are the maximum for each location and are in feet above Mean Sea Level, (1951 U.S.C. and G.S. Levels)

HURRICANE CAMILLE 14-22 AUG 1969

FLOODED AREA

CHEF MENTEUR - RIGOLETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144

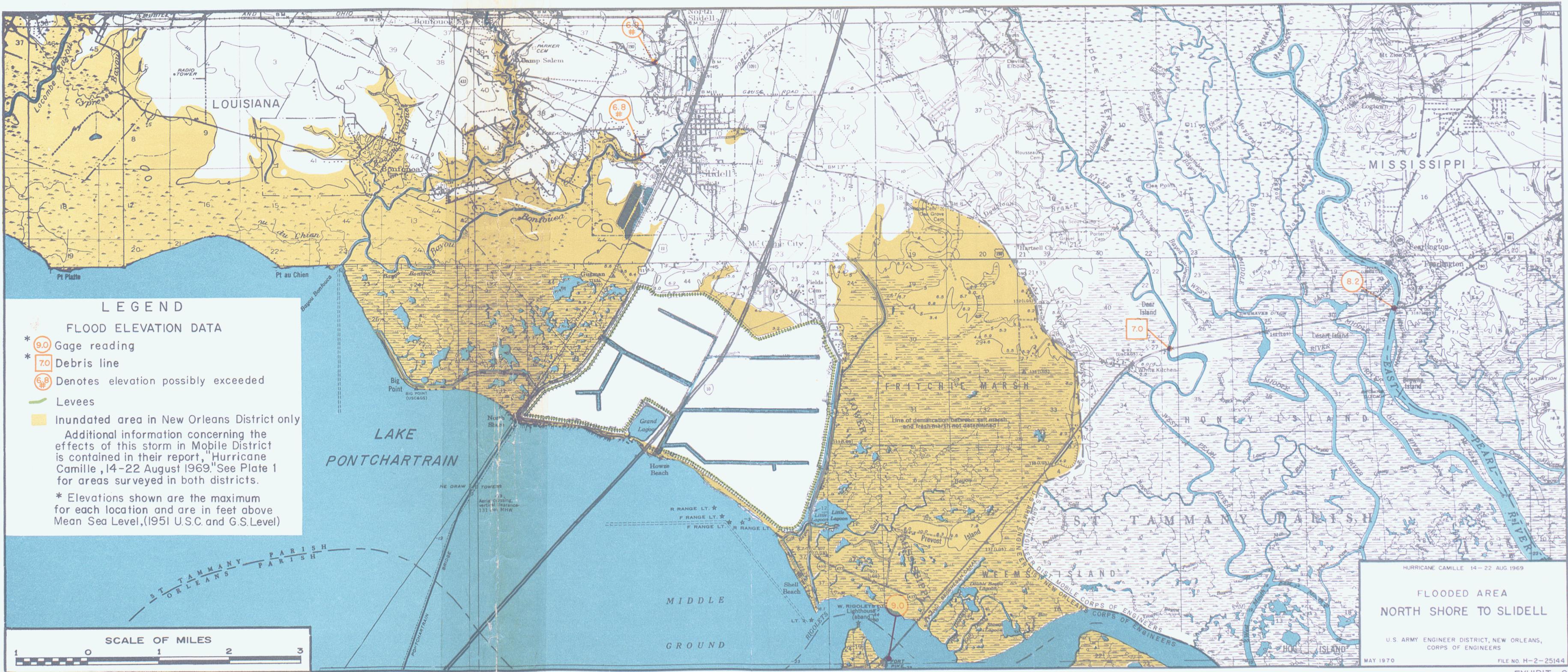


EXHIBIT 10
HURRICANE CAMILLE
METEOROLOGICAL DATA

Compiled from U. S. Weather Bureau Publications Except Where Noted

Station - Source of Information	Date August 1969	Barometric Pressure		Wind				Storm Rainfall (in Inches) ^(b)	Remarks
		Low in Inches	Times (GDT)	Fastest Mile ^(a) in mph and Direction	Times (GDT)	Gusts in mph and Direction	Times (GDT)		
Louisiana									
Baton Rouge Weather Bureau Office ^(d)	18	29.44	1:55 a.m.	23 NW	--	25	--	0.14	Eye passed about 110 miles east.
Bogalouss ^(c)	18	28.63	1:30 a.m.	--	--	100 NNW	--	4.10	Anemometer failed at 100 mph.
Boothville Weather Bureau Office ^(c)	17	28.34	7:40 p.m.	--	--	107	--	--	Power failure made wind equipment inoperative after gusts reached 107 mph.
Covington ^(e)	17	29.32	9:45 p.m.	60 NNE	--	90 NNE	--	2.50	Barometric pressure is from incomplete records. Wind velocities were estimated.
Drilling Rig (Block 92~Main Pass) ^{(c)(d)}	17	--	--	--	--	172	--	--	Paper jammed after gust was recorded and trace was lost.
Garden Isle Bay Plant Site on Dennis Pass ^(e)	17	27.80	5:55 p.m.	--	--	140-150	--	--	Anemometer failed at 95 mph, gusts were estimated. Data furnished by Freeport Sulphur Co.
Grand Isle (U. S. Coast Guard) ^(c)	17	29.21	7:30 p.m.	45	--	65	--	2.80	Wind velocities were estimated.
Mandeville ^(e)	--	--	--	75 W	--	100 W	--	0.50	Wind velocities were estimated.
New Orleans and Vicinity:									
Huey Long Bridge ^(c)	17	--	--	56	--	73	--	--	
International Airport (Moisant) ^(c)	17	29.23	11:02 p.m.	42 NNW	--	59	--	1.00	
Lakefront Airport ^(c)	--	--	--	87 NW	--	109 NW	--	--	
Mississippi River Bridge	17	--	--	64	--	78	--	--	Data furnished by Bridge Authority.
NAS (Callender Field) ^(c)	17	29.15	9:58 p.m. to 10:58 p.m.	50 NW	--	61 NW	--	2.60	
Weather Bureau Office ^(c)	17	29.14	10:15 p.m.	52 N	--	85 N	--	1.69	
Pilotown (SS Cristobal) ^(e)	17	28.04	7:00 p.m.	160 NNW	--	--	--	--	Wind velocities were estimated.
Port Sulphur ^(c)	17	28.98	8:00 p.m.	60	--	90 NW	--	--	
Slidell ^{(c)(e)}	17	28.56	11:40 p.m.	125 WNW	--	160 WNW	--	5.03	Wind velocities were estimated.
U. S. Coast Guard Station, Entrance to Southwest Pass	17	28.73	7:30 p.m.	85 NW	--	94 NW	--	--	
Mississippi									
Bay St. Louis St. Stanislaus School ^(f)	17	27.90	11:50 p.m.	--	--	140	--	Recorder failed	Anemometer recorded 140 mph before wind bent support. Wind velocity was estimated.
West End of Bridge ^(c)	17	26.85	--	--	--	--	--	--	
Biloxi, Keesler AFB ^(c)	17	28.94	12:15 a.m.	81-110 ^o	11:55 p.m.	129-100 ^o	10:55 p.m.	--	Barometric pressure was recorded on August 18.
Brandon (Civil Defense) ^(c)	18	--	--	70 E	7:00 a.m.	80 E	7:00 a.m.	2.3	
Columbia (James Thornhill) ^(c)	18	28.29	3:08 a.m.	120 NE	3:00 a.m.	135 NE	3:08 a.m.	4.85	Wind instrument disabled as speed reached 120 and gusts to 135 mph; gusts estimated to 140 mph.
Greenwood Airport (Federal Aviation Administration) ^(c)	18	29.13	12:55 p.m.	25 NE	7:57 a.m.	47 E	1:25 p.m.	1.98	
Hattiesburg ^(f)	--	29.66	--	--	--	100 ESE	--	--	Barometric reading questionable.
Jackson Weather Bureau Office ^{(c)(d)}	18	28.93	7:56 a.m.	--	--	67 NNE	7:14 a.m.	2.23	Eye passed 10 miles east about 8:00 a.m.
McComb (Federal Aviation Administration) ^(c)	18	28.68	2:00 a.m.	28-340 ^o	3:00 a.m.	51-340 ^o	2:00 a.m.	1.28	
Meridian Weather Bureau Office ^(d)	18	29.47	7:08 a.m.	24 SE	6:30 a.m.	41	6:30 a.m.	2.17	Center passed about 95 miles southwest.
Pascagoula (Ingalls Shipbuilding Corporation) ^(c)	17	29.26	11:45 p.m.	--	--	81 ESE	11:45 p.m.	5.50	
Picayune (Mississippi Test Facility) ^{(c)(d)}	18	28.06	12:15 a.m.	120-140	--	160	--	10.06	Wind velocities were estimated.
Purvis ^(f)	18	29.40	2:00 a.m.	150 SE	--	--	--	4.23	Wind velocity was estimated.
Alabama									
Mobile Weather Bureau Office ^(c)	17	29.44	10:56 p.m.	44 SE	--	74 SE	--	6.05	
Montgomery Weather Bureau Office ^(d)	18	29.79	3:00 a.m. to 6:00 a.m.	23 S	12:19 p.m.	35 S	12:19 p.m.	0.81	One unconfirmed tornado reported by public about 30 miles south of Montgomery.
Florida									
Apalachicola Weather Bureau Office ^(d)	17	29.81	--	34 SE	5:09 p.m.	52 SE	5:11 p.m.	0.47	Tides 3-4 feet above normal, Gulf County; peak gusts estimated 50 mph and tides 5.5 feet above normal, Bay County.
Pensacola NAS (Sherman Field) ^(c)	17	29.58	6:55 p.m.	--	--	71 SE	--	3.55	
Pensacola Weather Bureau Office ^(d)	17	29.61	7:59 p.m. and 8:58 p.m.	--	--	58 SE	10:58 p.m.	2.76	Santa Rosa County CD: tides estimated 4.5 feet above astronomical, Okaloosa County; water level checked by Engineers 4 feet above astronomical.

^(a) Average velocity over a period of at least 1 minute. ^(b) Cumulative rainfall for a 32-hour period, August 17-18, 1969. ^(c) From an extract on Hurricane Camille reprinted from U. S. Department of Commerce, ESSA's Climatological Data, National Summary, Vol 20, No. 8, 1969. ^(d) From a Preliminary Report on Hurricane Camille, August 14-22, 1969, by U. S. Department of Commerce, ESSA, September 1969. ^(e) From Climatological Data for Louisiana, U. S. Department of Commerce, ESSA, Vol 74, No. 8, August 1969. ^(f) From a Preliminary compilation "Hurricane Camille...Gulf of Mexico...August 14-18, 1969," by U. S. Department of Commerce, ESSA, Weather Bureau, New Orleans, Louisiana.

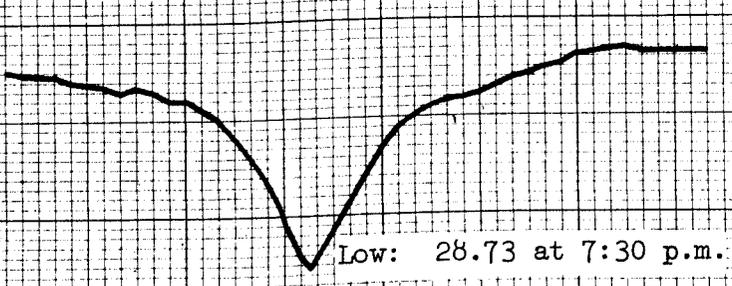
EXHIBIT 11
HURRICANE CAMILLE
TEMPERATURES
16-19 August 1969

Station	Date	Temperature			Departure from Normal ^(a)
		Maximum	Minimum	Average	
Alexandria, La.	16	91	69	80	-2
	17	94	71	83	+1
	18	94	76	85	+3
	19	93	71	82	0
Baton Rouge, La.	16	91	71	81	0
	17	88	73	81	0
	18	92	74	83	+2
	19	89	75	82	+1
Lafayette, La.	16	92	73	83	+1
	17	92	74	83	+1
	18	95	78	87	+5
	19	90	77	84	+2
Lake Charles, La.	16	91	73	82	-1
	17	95	72	84	+1
	18	93	72	83	0
	19	91	76	84	+1
Monroe, La.	16	93	73	83	--
	17	97	75	86	--
	18	88	74	81	--
	19	95	75	85	--
New Orleans International Airport, La.	16	91	70	81	0
	17	82	75	79	-2
	18	90	74	82	+1
	19	89	79	84	+3
Shreveport, La.	16	101	75	88	+5
	17	98	76	87	+4
	18	99	75	87	+4
	19	100	74	87	+4
Jackson, Miss.	16	96	72	84	+3
	17	93	70	82	+1
	18	83	74	79	-2
	19	93	76	85	+4
McComb, Miss.	16	93	68	81	--
	17	87	71	79	--
	18	91	70	81	--
	19	93	75	84	--
Meridian, Miss.	16	93	66	80	-1
	17	90	69	80	-1
	18	84	74	79	-2
	19	93	75	84	+3
Mobile, Ala.	16	92	74	83	+1
	17	82	78	80	-2
	18	89	77	83	+1
	19	92	80	86	+4
Pensacola, Fla.	16	89	78	84	+2
	17	82	76	79	-3
	18	86	79	83	+1
	19	89	78	84	+2

^(a) Normal temperature based on 30 years of record (1931-1960).

BAROMETRIC PRESSURE IN INCHES

30
29
28



N
Wind Dir.



WIND VELOCITY IN MILES PER HOUR

80
60
40
20

Hourly Wind Movement
(Maximum Gusts to 94 m.p.h.)

16 Aug

17 Aug

18 Aug

* Midnight

BAROMETER AND ANEMOMETER:
U. S. Coast Guard Station,
Entrance to Southwest Pass.

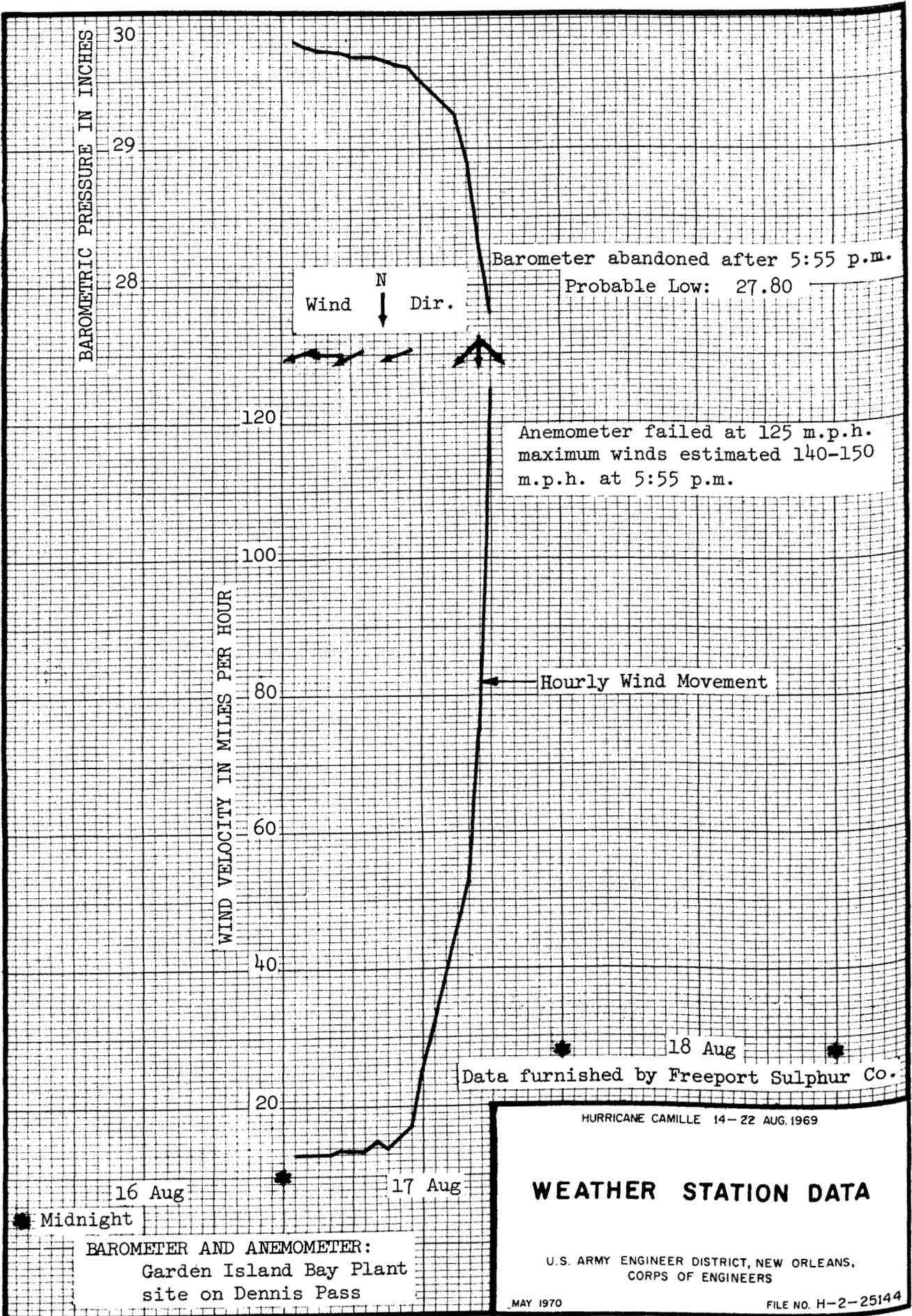
HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



BAROMETRIC PRESSURE IN INCHES

30
29
28

Low: 28:04 at 7:00 a.m.

BAROMETER

S. S. Cristobal at Pilottown

BAROMETRIC PRESSURE IN INCHES

30
29
28

Record incomplete as instrument was submerged by rising water.

Probable low: 28:34 at 7:40 p.m.

17 Aug

18 Aug

* Midnight

BAROMETER:

U. S. Weather Bureau at
Boothville, La.

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

EXHIBIT 14

BAROMETRIC PRESSURE IN INCHES

30
29
28

Low: 28.98 at 8:00 p.m.

N
↓
Wind Dir.

80
60
40
20
0
WIND VELOCITY IN MILES PER HOUR



Average Gusts
(Maximum Gusts to 90 m.p.h.)

Average
Wind Movement

17 Aug

18 Aug

Midnight

BAROMETER AND ANEMOMETER:
Freeport Sulphur Co. at
Port Sulphur, La.

HURRICANE CAMILLE 14-22 AUG. 1969

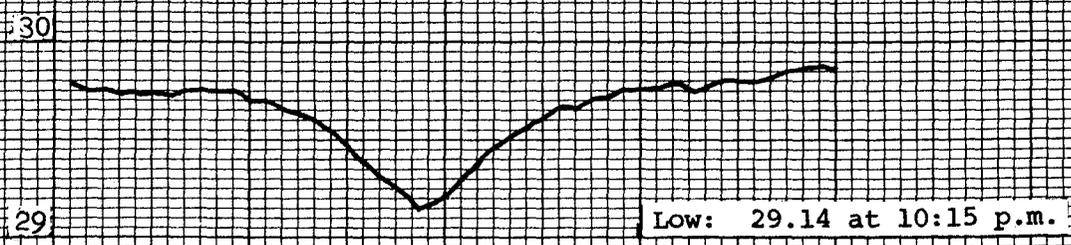
WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

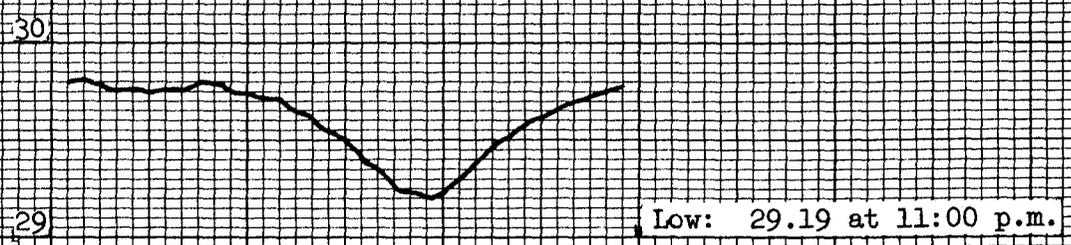
FILE NO. H-2-25144

BAROMETRIC PRESSURE IN INCHES



BAROMETER:
 U. S. Weather Bureau; 701 Loyola
 Ave., New Orleans, La.

BAROMETRIC PRESSURE IN INCHES



BAROMETER:
 S. S. Ruth Lykes at Nashville
 Ave. Wharf, New Orleans, La.

★ 17 Aug ★ 18 Aug ★ 19 Aug

★ Midnight

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144

BAROMETRIC PRESSURE IN INCHES

30

29

Low: 29.22 from 11:00 p.m. to
Midnight

N
↓
Wind Dir.



WIND VELOCITY IN MILES PER HOUR

60

40

20

0

Hourly Wind Movement

17 Aug

18 Aug

19 Aug

* Midnight

BAROMETER AND ANEMOMETER:
Lake Pontchartrain at
West End, La.

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

BAROMETRIC PRESSURE IN INCHES

30
29

Low: 29.23 at 11:02 p.m.

N
Wind ↓ Dir.

60

WIND VELOCITY IN MILES PER HOUR

40
20
0

Maximum Gusts

Hourly Wind Movement

*

17 Aug

*

18 Aug

*

19 Aug

*

Midnight

BAROMETER AND ANEMOMETER:
New Orleans International Airport

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

EXHIBIT 18

BAROMETRIC PRESSURE
IN INCHES

30
29

Low: 29.20 from 10:00 p.m. to 11:00 p.m.

BAROMETER:

U. S. Engineer Office
Foot of Prytania Street
New Orleans, Louisiana

WIND VELOCITY IN MILES PER HOUR

60
40
20

Hourly Wind Movement
(Maximum Gusts to 78 m.p.h.)

ANEMOMETER:

Greater New Orleans Miss. River Bridge,
Data furnished by Bridge Authority

17 Aug

18 Aug

19 Aug

Midnight

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

BAROMETRIC PRESSURE IN INCHES

30

29

28

27

26

16 Aug

17 Aug

18 Aug

BAROMETER:

St. Stanislaus College, Bay
St. Louis, Miss.

◆ Midnight

Low: 27.90

Observed on stand-by instrument
after recording barometer reached
it's lowest limit

HURRICANE CAMILLE 14-22 AUG. 1969

WEATHER STATION DATA

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

EXHIBIT 20

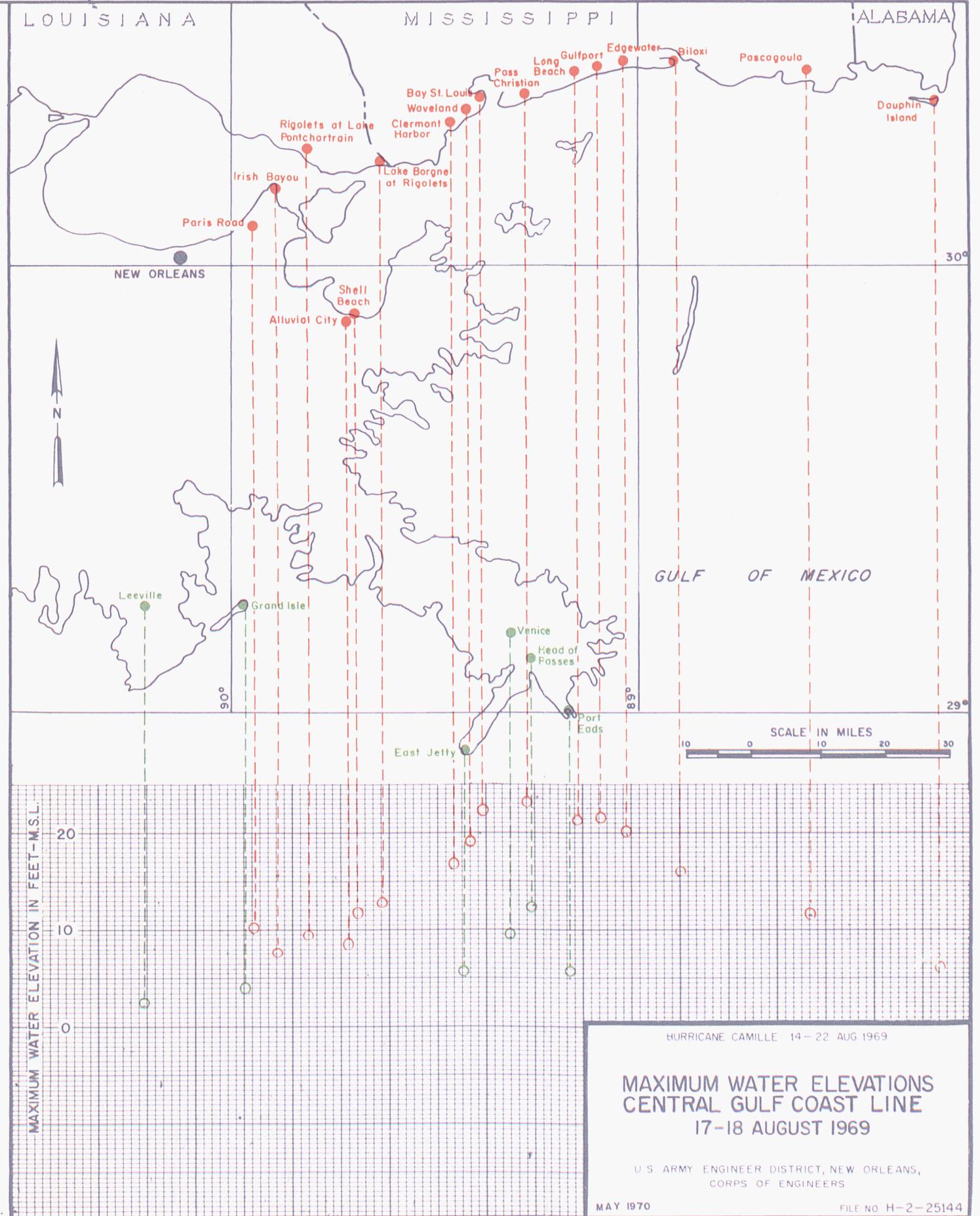
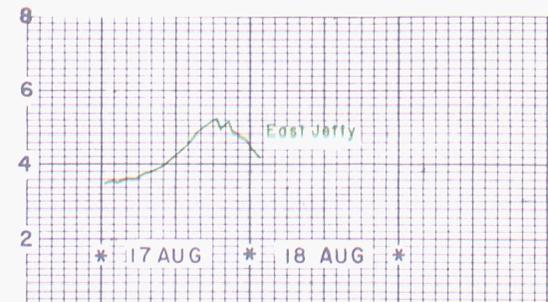
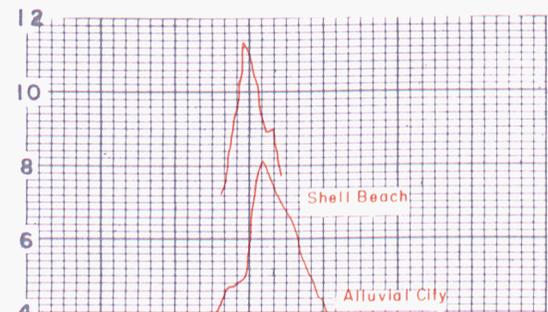
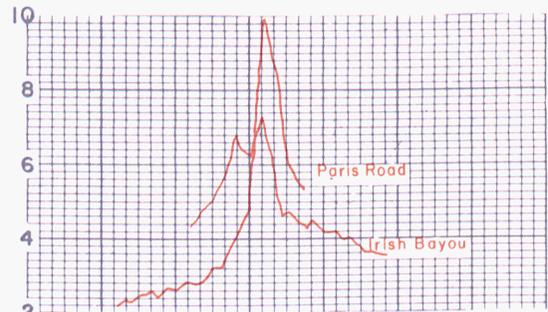


EXHIBIT 23

RECORD HIGH-WATER ELEVATIONS RESULTING FROM TROPICAL STORMS

1909-1969

HURRICANE CAMILLE

17-18 August 1969

Gage or Location	Water Height in Feet, Mean Sea Level				
	Hurricane Camille			Pre-Camille	
	Highest Recorded	Date	Hour	Highest Recorded	Cause of High Water
<u>Gulf of Mexico</u>					
Port Eads, La.	5.2	17	A	5.5	B
Grand Isle, La.	3.6	17	A	9.0	C
Waveland, Miss.	18.7 ^(a)	17	A	13.7	B,D
Bay St. Louis, Miss.	21.7 ^(a)	17	A	15.2	E
Pass Christian, Miss.	22.6 ^(a)	17	A	15.0	E
Gulfport, Miss.	21.0 ^(a)	17	A	14.0	E
Biloxi, Miss. (Gage)	15.5 ^(a)	17	A	10.8	E
<u>Mississippi River and Vicinity</u>					
Head of Passes, La.	12.0 ^(a)	17	A	6.6	B
Boothville, La. (W. Landside)	14.6 ^(a)	17	A	9.2	B
Buras, La. (W. Landside)	13.4 ^(a)	17	A	7.7	B,C
Ostrica Lock, La.	15.9 ^(a)	17	A	13.6	B
Empire, La.	10.9	17	A	See Footnote (b)	
Empire, La. (W. Landside)	9.5	17	A	10.4	B
W. Pointe a la Hache, La.	11.8	17	9:00 p.m.	15.3	B
Chalmette, La.	11.3	17	11:00 p.m.	12.5	B,F
(GIW) at Algiers Lock, La.	11.4	17	10:30 p.m.	13.1	B,F
New Orleans, La.	10.8	17	11:15 p.m.	12.4	B,F
<u>Bayou Lafourche</u>					
Leeville, La.	2.1	18	7:30 a.m.	9.0	C
<u>Bayou Barataria</u>					
Lafitte, La.	1.5	18	2:00 a.m.	4.0	G
Barataria, La.	1.9	18	3:15 a.m.	3.6	G
<u>Delacroix, La.</u>	1.9	A	--	11.0	B,H
<u>Bayou la Loutre</u>					
Alluvial City, La.	8.0	18	12:50 a.m.	11.7	B,D
<u>Mississippi River-Gulf Outlet</u>					
Shell Beach, La.	11.1 ^(a)	17	10:30 p.m.	9.2	B,I
Paris Road, New Orleans	9.7	18	2:00 a.m.	10.3	B,I
<u>Lake Borgne</u>					
Shell Beach, La.	11.1 ^(a)	A	--	11.2	E
Rigolets, La.	12.3 ^(a)	A	--	10.6	B
<u>Lake Pontchartrain</u>					
Inner Harbor Navigation Canal near Seabrook, New Orleans	6.5	18	1:15 a.m.	7.0 ^(c)	B
West End, New Orleans	5.2	17	11:00 p.m.	7.6	B
Frenier, La.	4.6	A	--	13.0	C
Causeway at Midlake, La.	4.1	18	9:00 a.m.	5.5	B,I
Mandeville, La.	4.6 ^(a)	18	5:40 a.m.	7.7	C
Irish Bayou near South Shore	7.2 ^(a)	18	1:10 a.m.	5.4	B,J
Rigolets, La. (Hwy 90)	9.0 ^(a)	18	1:00 a.m.	7.2	C
Chef Menteur Pass, near U. S. Hwy 90	8.7	18	1:00 a.m.	10.1	C

(a) New record established.

(b) Stage was probably exceeded during Betsy.

(c) Highest since 1962.

A Records obtained from water mark. Date and/or time indefinite.

B "Betsy," September 1965.

C September 1915 hurricane.

D 1947 record unknown.

E September 1947 hurricane.

F Major headwater floods not included.

G "Hilda," October 1964.

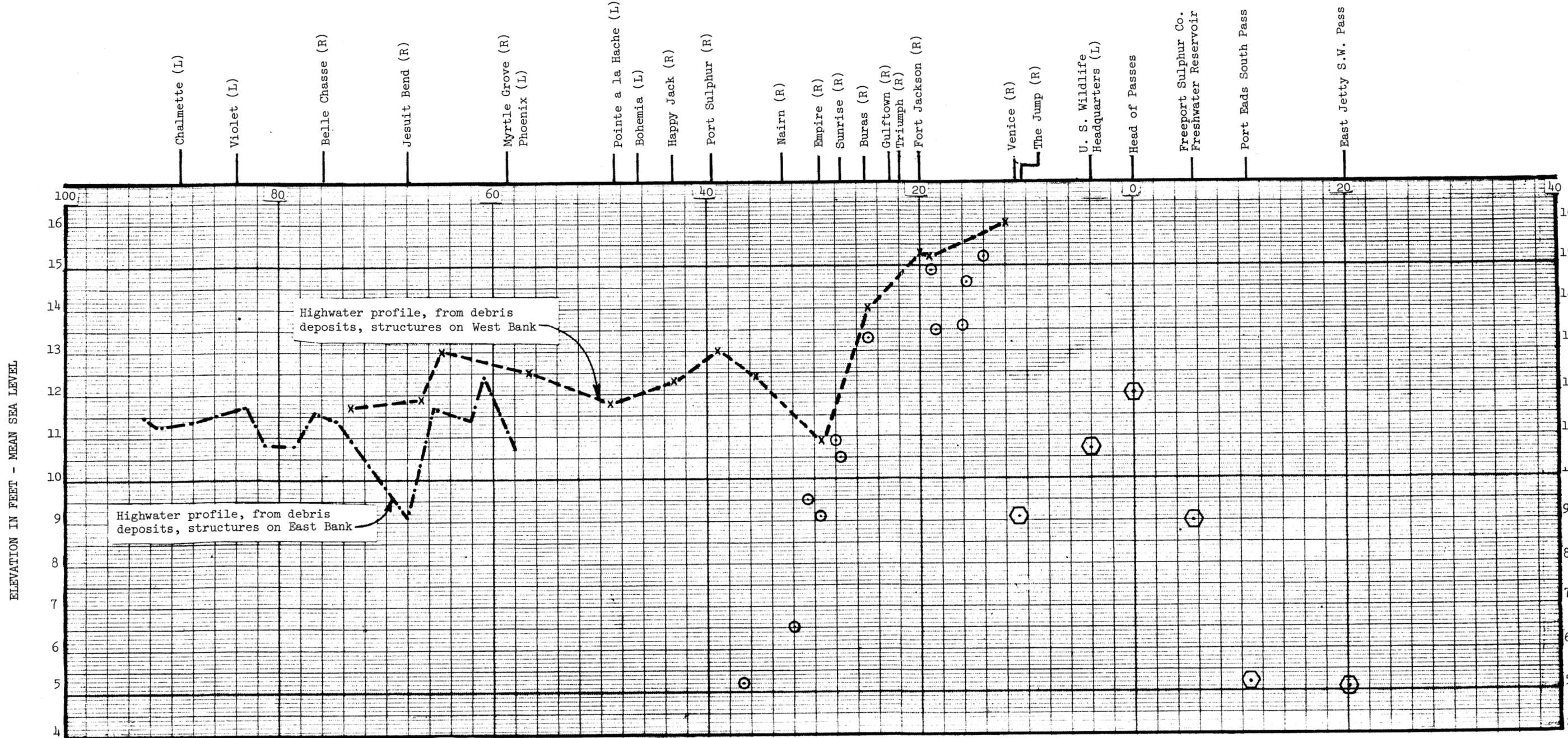
H 1915 and 1947 records unknown.

I Period covered, 1958-1969.

J Period covered, 1956-1969.

DISTANCE IN MILES ABOVE HEAD OF PASSES (AHP)

DISTANCE IN MILES BELOW HEAD OF PASSES (BHP)



LEGEND

- Highwater elevations within leveed areas from debris deposits and other indications
- ⬡ Highwater elevations below the levee system, from debris deposits or marks on structures (The Jump to Gulf of Mexico).
- R - Located on right bank
- L - Located on left bank

NOTE:

- (1) Elevations shown are the maximum for each location and are in feet above Mean Sea Level. (1951 U.S.C. & G.S. Levels)
- (2) The river surge overtopped levee on west bank as far upstream as mile 44.8 (AHP)

HURRICANE CAMILLE 14-22 AUG 1969

HIGHWATER PROFILES ALONG THE MISSISSIPPI RIVER

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, CORPS OF ENGINEERS

MAY 1970

FILE NO H-2-25144

EXHIBIT 25

HURRICANE CAMILLE

TIDE GAGE DATA ALONG THE LOUISIANA COAST

16-19 August 1969

Sheet 1 of 4 sheets

Location	16 August																							
	A.M.											P.M.												
	1	2	3	4	5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	9	10	11	Midnight
<u>Gulf Stations</u>																								
<u>Mississippi River (Southwest Pass)</u>																								
East Jetty, La.	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.8	2.8	2.8	2.9	2.8	2.8	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	3.1
Approximate miles to eye				390 SE						330 SE						290 SSE					220 SSE			
<u>Mississippi River (South Pass)</u>																								
Port Eads, La.	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.6	
Approximate miles to eye				390 SSE						330 SSE					290 SSE						220 SSE			
<u>Inland Stations</u>																								
<u>Mississippi River</u>																								
Empire, La.	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.5	
West Pointe a la Hache, La.	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.5	2.4	2.4	2.3	2.4	2.4	2.5
Chalmette, La.	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.5
Algiers Lock, La.	3.3	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.5	3.4	3.5	3.4	3.4	3.4
New Orleans, La.	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.5	3.4	3.4	3.4	3.4
<u>Bayou LaLoutre</u>																								
Alluvial City, La.	1.0	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.5	1.6	1.7	1.8	1.9	1.9	1.8	1.8	1.8	1.8
<u>Mississippi River-Gulf Outlet</u>																								
Shell Beach, La.	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.8	1.9	2.0	2.1	2.1	2.0	2.0	1.9	2.0	2.0
Paris Road, New Orleans	1.5	1.4	1.5	1.6	1.8	2.0	2.0	2.0	2.1	2.1	2.1	2.0	1.9	1.9	2.1	2.2	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.4
<u>Inner Harbor Navigation Canal</u>																								
Seabrook Bridge (New Orleans)	1.6	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.1
<u>Lake Pontchartrain</u>																								
West End, New Orleans	1.8	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8
Causeway at Midlake, La.	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8
Mandeville, La.	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.6	1.6	1.6	1.7	1.8	1.8	1.7	1.8	1.8	1.8
Irish Bayou near South Shore	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.8	1.9	2.0	1.9	2.0
Rigolets, La. (Hwy 90)	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7
Chef Menteur Pass, near U. S. Hwy 90	1.2	1.2	1.2	1.2	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.6	1.7	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.8

Note: Data is from Corps of Engineers recording gages and is shown in feet above mean sea level.

EXHIBIT 25 (Continued)

Location	17 August																							
	A.M.											P.M.												
	1	2	3	4	5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	9	10	11	Midnight
<u>Gulf Stations</u>																								
<u>Mississippi River (Southwest Pass)</u>																								
East Jetty, La. Approximate miles to eye	3.2	3.3	3.2	3.2 155 SE	3.4	3.3	3.3	3.5	3.6	3.6 100 SSE	3.8	3.8	4.0	4.2	4.3	4.5 30 ESE	4.7	4.8	4.9 ^(a)	4.7	4.9	4.8 75 NNE	4.6	4.5
<u>Mississippi River (South Pass)</u>																								
Port Eads, La. Approximate miles to eye	2.7	2.8	2.8	2.8 155 SSE	2.9	2.9	3.0	3.0	3.1	3.3 95 SSE	3.3	Gage failed ^(b)				20 SE						65 N		
<u>Inland Stations</u>																								
<u>Mississippi River</u>																								
Empire, La.	2.6	2.7	2.8	2.8	2.9	2.9	3.1	3.1	3.1	3.1	3.4	3.6	3.6	3.9	4.1	4.6	5.0	6.2	Gage failed ^(c)					
West Pointe a la Hache, La.	2.6	2.7	2.7	2.8	2.9	3.0	3.0	3.3	3.2	3.2	3.3	3.4	3.5	3.6	3.7	3.9	4.3	5.0	6.0	9.6	11.8	9.7	7.0	6.4
Chalmette, La.	3.6	3.7	3.7	3.8	3.9	3.9	4.0	4.0	4.1	4.2	4.2	4.1	4.2	4.3	4.4	4.4	4.5	4.7	4.9	5.7	7.1	10.7	11.3	9.3
Algiers Lock, La.	3.5	3.6	3.6	3.7	3.7	3.8	3.9	3.9	4.0	4.2	4.1	4.1	4.1	4.3	4.4	4.4	4.4	4.6	4.8	5.3	6.2	9.6 ^(d)	11.0	9.6
New Orleans, La.	3.5	3.5	3.6	3.7	3.7	3.8	3.9	3.9	3.9	4.2	4.1	4.1	4.1	4.3	4.3	4.4	4.4	4.5	4.7	4.9	5.8	7.7	10.6 ^(e)	10.0
<u>Bayou LaLoutre</u>																								
Alluvial City, La.	1.9	2.0	2.1	2.2	2.3	2.4	2.4	2.5	2.8	2.8	2.8	2.9	3.0	3.0	3.2	3.4	3.6	3.8	4.1	4.4	4.5	4.5	4.8	7.1
<u>Mississippi River-Gulf Outlet</u>																								
Shell Beach, La.	2.1	2.3	2.4	2.6	2.8	2.8	3.0	3.1	3.3	3.3	3.5	3.5	3.6	3.9	4.2	4.6	5.0	5.8	6.9	7.8	9.0	10.1 ^(f)	10.7	10.0
Paris Road, New Orleans	2.5	2.6	2.7	2.9	3.0	3.2	3.3	3.4	3.7	3.9	3.8	3.8	4.0	4.1	4.3	4.5	4.7	4.9	5.2	5.9	6.4	6.5	6.1	6.0
<u>Inner Harbor Navigation Canal</u>																								
Seabrook Bridge (New Orleans)	2.2	2.3	2.3	2.5	2.6	2.7	2.8	2.8	3.1	3.1	3.1	3.3	3.4	3.4	3.6	3.9	4.0	4.2	4.8	5.1	5.5	5.8	5.2	4.8
<u>Lake Pontchartrain</u>																								
West End, New Orleans	1.8	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.5	2.7	2.8	2.9	3.1	3.3	3.4	4.0	4.4	4.6	4.8	5.2	4.2
Causeway at Midlake, La.	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.9	3.0	3.1	3.2	3.0
Mandeville, La.	1.9	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.0	1.7	1.4	1.4	1.2	0.7	1.1
Irish Bayou near South Shore	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.4	2.3	2.4	2.5	2.5	2.6	2.8	2.6	2.7	2.8	3.1	3.1	3.1	3.6	4.2	4.5	4.8
Rigolets, La. (Hwy 90)	1.8	1.9	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.6	2.6	2.8	3.4	4.0	4.5	7.7
Chef Menteur Pass, near U. S. Hwy 90	1.9	1.9	2.1	2.2	2.2	2.4	2.5	2.6	2.7	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.4	3.6	3.9	4.2	5.0	5.6	5.8	7.1

(a) 5.02 at 7:20 p.m. (b) 5.18 maximum from water mark. (c) 10.92 maximum from water mark. (d) 11.39 at 10:30 p.m. (e) 10.80 at 11:15 p.m. (f) 11.06 at 10:30 p.m.

EXHIBIT 25 (Continued)

Location	18 August																							
	A.M.											Midnight	P.M.											
	1	2	3	4	5	6	7	8	9	10	11	11	1	2	3	4	5	6	7	8	9	10	11	
<u>Gulf Stations</u>																								
<u>Mississippi River (Southwest Pass)</u>																								
East Jetty, La.	4.4	4.2	4.1	← No record →																				
Approximate miles to eye	150 N																							
<u>Mississippi River (South Pass)</u>																								
Port Eads, La.	← No record →																							
Approximate miles to eye	150 NNW																							
<u>Inland Stations</u>																								
<u>Mississippi River</u>																								
Empire, La.	← No record →																							
West Pointe a la Hache, La.	6.2	5.6	5.2	4.8	4.6	4.3	4.1	3.9	3.7	3.5	3.3	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	
Chalmette, La.	7.6	7.5	7.1	6.8	6.5	6.2	6.0	5.8	5.7	5.4	5.2	5.0	4.8	4.6	4.5	4.5	4.5	4.4	4.3	4.3	4.3	4.3	4.4	4.3
Algiers Lock, La.	8.0	7.4	7.2	7.0	6.8	6.3	6.1	5.8	5.6	5.4	5.2	5.0	4.8	4.6	4.4	4.3	4.4	4.3	4.2	4.2	4.2	4.2	4.2	4.2
New Orleans, La.	8.2	7.3	7.1	6.9	6.5	6.3	6.0	5.8	5.6	5.4	5.2	5.0	4.8	4.6	4.5	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.2
<u>Bayou LaLoutre</u>																								
Alluvial City, La.	7.9 ^(a)	7.5	7.1	6.9	6.6	6.1	5.6	5.2	4.8	4.4	4.1	3.8	3.6	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.8	2.7	2.7	2.6
<u>Mississippi River-Gulf Outlet</u>																								
Shell Beach, La.	9.1	8.6	8.7	7.7	6.6	5.8	5.1	4.5	4.1	3.6	3.3	3.0	2.9	2.8	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5
Paris Road, New Orleans	7.8	9.7	8.8	8.0	7.0	5.9	5.3	4.9	4.5	4.2	3.9	3.7	3.5	3.4	3.3	3.2	3.1	3.1	2.9	3.0	2.9	2.9	2.9	2.9
<u>Inner Harbor Navigation Canal</u>																								
Seabrook Bridge (New Orleans)	6.3 ^(b)	5.9	5.4	5.3	4.7	4.6	4.3	4.4	4.2	4.0	4.0	4.0	3.8	3.7	3.6	3.6	3.5	3.4	3.3	3.3	3.3	3.3	3.2	3.2
<u>Lake Pontchartrain</u>																								
West End, New Orleans	3.1	2.5	2.3	2.6	3.2	3.3	3.6	3.6	3.8	3.8	3.8	3.8	3.8	3.7	3.6	3.5	3.4	3.3	3.4	3.2	3.2	3.2	3.2	3.0
Causeway at Midlake, La.	2.8	3.1	3.3	3.4	3.8	3.8	3.9	4.0	4.1	4.0	4.0	4.0	3.9	3.9	3.8	3.7	3.6	3.6	3.5	3.4	3.3	3.3	3.2	3.2
Mandeville, La.	2.2	3.6	4.3	4.0	4.3	4.4 ^(c)	4.0	4.3	4.2	4.1	4.3	4.1	3.9	3.8	3.8	3.7	3.6	3.7	3.6	3.3	3.4	3.3	3.3	3.2
Irish Bayou near South Shore	7.1 ^(d)	6.8	6.0	5.1	4.4	4.5	4.5	4.2	4.1	4.3	4.1	3.9	3.9	3.8	3.7	3.7	3.6	3.4	3.4	3.4	3.4	3.3	3.2	3.2
Rigolets, La. (Hwy 90)	9.0	8.5	7.2	6.1	5.4	5.0	4.8	4.3	4.0	4.0	3.7	3.5	3.5	3.3	3.3	3.3	3.1	3.0	2.9	2.9	2.9	2.8	2.8	2.7
Chef Menteur Pass, near U. S. Hwy 90	8.7	8.3	7.4	6.5	5.3	4.9	4.7	4.2	3.9	3.9	3.4	3.4	3.3	3.2	3.0	3.0	3.0	2.8	2.8	2.8	2.8	2.7	2.7	2.7

(a) 7.97 at 12:50 a.m. (b) 6.47 at 1:15 a.m. (c) 4.56 at 5:40 a.m. (d) 7.16 at 1:10 a.m.

EXHIBIT 25 (Concluded)

Sheet 4 of 4 sheets

Location	19 August																							
	A.M.											P.M.												
	1	2	3	4	5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	9	10	11	Midnight
<u>Gulf Stations</u>																								
<u>Mississippi River (Southwest Pass)</u>																								
East Jetty, La.	No record																							
Approximate miles to eye																								
<u>Mississippi River (South Pass)</u>																								
Port Eads, La.	No record											2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5	2.7	2.8	
Approximate miles to eye																								
<u>Inland Stations</u>																								
<u>Mississippi River</u>																								
Empire, La.	No record																							
West Pointe a la Hache, La.	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.0	2.8	2.7	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.5
Chalmette, La.	4.4	4.4	4.4	4.4	4.4	4.4	4.3	4.3	4.2	4.2	4.0	4.0	3.9	3.8	3.8	3.7	3.7	3.6	3.6	3.5	3.5	3.5	3.5	3.6
Algiers Lock, La.	4.2	4.2	4.3	4.3	4.2	4.2	4.2	4.1	4.0	4.0	3.8	3.8	3.7	3.6	3.5	3.4	3.5	3.4	3.3	3.3	3.3	3.3	3.3	3.3
New Orleans, La.	4.2	4.3	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.1	4.0	4.0	3.8	3.7	3.7	3.6	3.6	3.5	3.4	3.4	3.4	3.4	3.4	3.4
<u>Bayou LaLoutre</u>																								
Alluvial City, La.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.1	2.0	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8
<u>Mississippi River-Gulf Outlet</u>																								
Shell Beach, La.	2.5	2.5	2.6	2.7	2.7	2.6	2.6	2.4	2.2	2.1	1.9	1.8	1.6	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.5	1.6	1.8	1.9
Paris Road, New Orleans	2.9	3.0	3.0	3.1	3.1	3.1	3.0	2.9	2.8	2.7	2.6	2.4	2.3	2.2	2.1	1.9	1.8	1.8	1.7	1.7	1.9	2.0	2.1	2.2
<u>Inner Harbor Navigation Canal</u>																								
Seabrook Bridge (New Orleans)	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.3	2.3
<u>Lake Pontchartrain</u>																								
West End, New Orleans	3.0	3.0	3.0	2.9	2.8	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.5	2.4	2.4	2.2	2.3	2.2	2.2	2.1	2.2
Causeway at Midlake, La.	3.1	3.1	3.0	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2
Mandeville, La.	3.1	3.1	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.7	2.7	2.6	2.5	2.7	2.6	2.4	2.4	2.2	2.2	2.3	2.3	2.1	2.0
Irish Bayou near South Shore	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0	2.9	2.9	2.8	2.8	No record	No record	2.5	2.4	2.5	2.6	2.4	2.2	2.3	2.3	2.4	2.3
Rigolets, La. (Hwy 90)	2.7	2.7	2.7	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2.0	2.0	1.8	1.8	1.8	1.9	1.8	1.7	1.7	1.9	1.9
Chef Menteur Pass, near U. S. Hwy 90	2.7	2.8	2.7	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0	1.9	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.9	1.9

TIDE HEIGHT IN FEET - M.S.L.

6

4

2

0

5.02 @ 7:20 p.m.

No Record

19 Aug.

16 Aug.

17 Aug.

18 Aug.

* Midnight

TIDE STATION:

Mississippi River (Southwest Pass) at East Jetty, La.
Lat. 28° 55' Long. 89° 26'

HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

TIDE HEIGHT IN FEET - M.S.L.

6
4
2
0

16 Aug 17 Aug 18 Aug 19 Aug

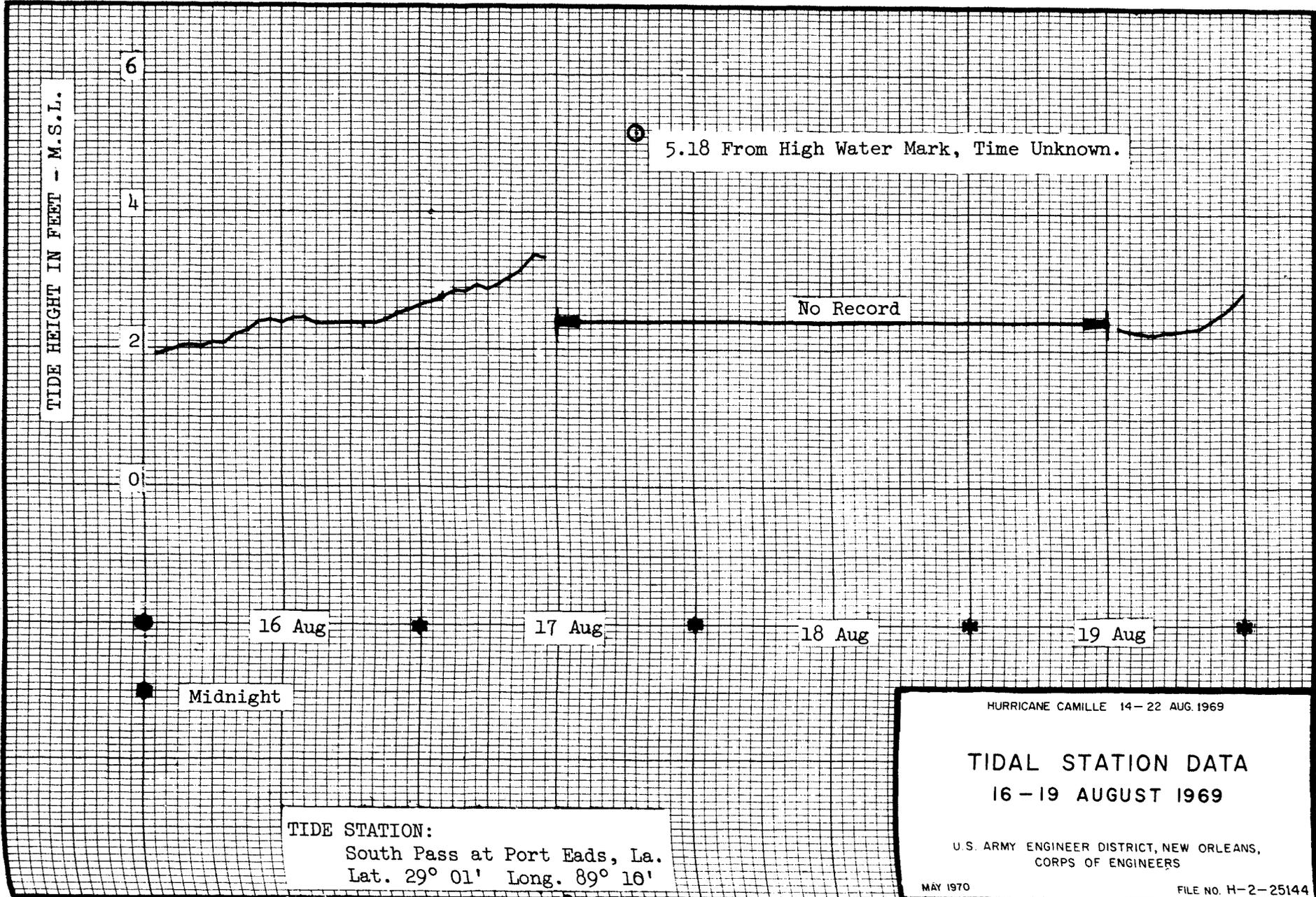
Midnight

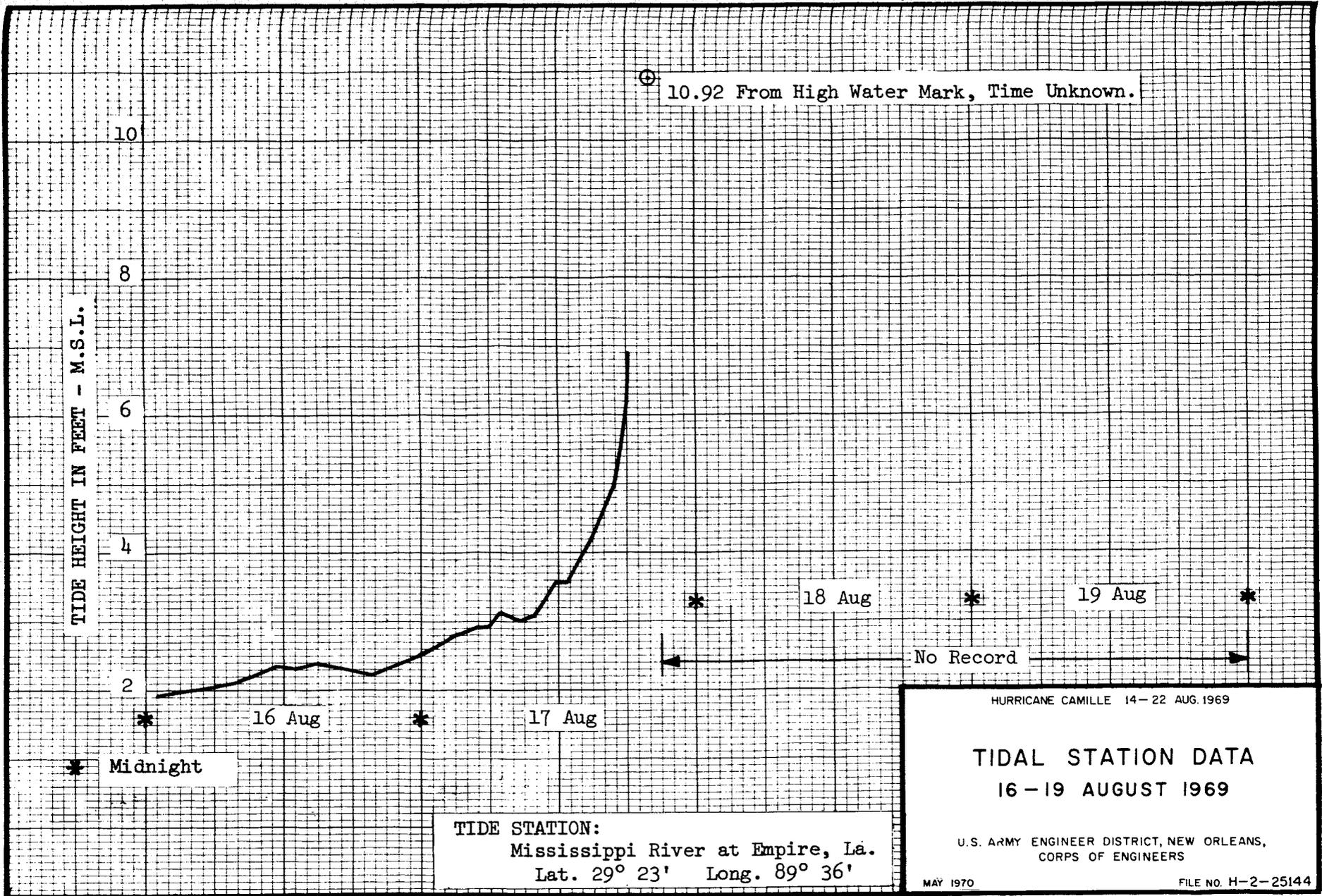
5.18 From High Water Mark, Time Unknown.

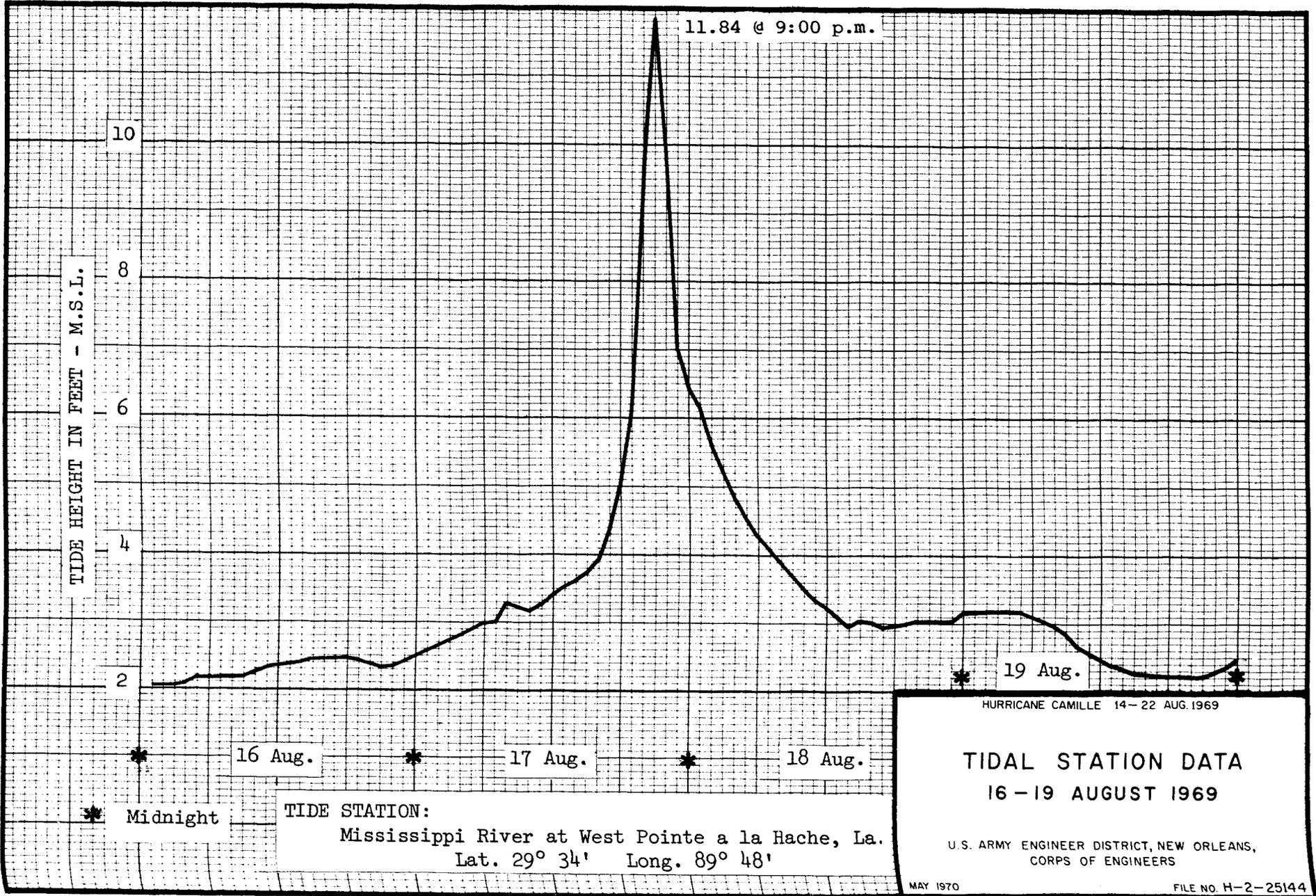
No Record

TIDE STATION:
South Pass at Port Eads, La.
Lat. 29° 01' Long. 89° 10'

HURRICANE CAMILLE 14-22 AUG. 1969
TIDAL STATION DATA
16-19 AUGUST 1969
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS
MAY 1970 FILE NO. H-2-25144







TIDE HEIGHT IN FEET - M.S.L.

8
6
4
2
0

* 16 Aug. * 17 Aug. * 18 Aug. * 19 Aug. *

* Midnight

7.97 @ 12:50 a.m.

TIDE STATION:
Bayou La Loutre at Alluvial City, La.
Lat. 29° 50' Long. 89° 41'

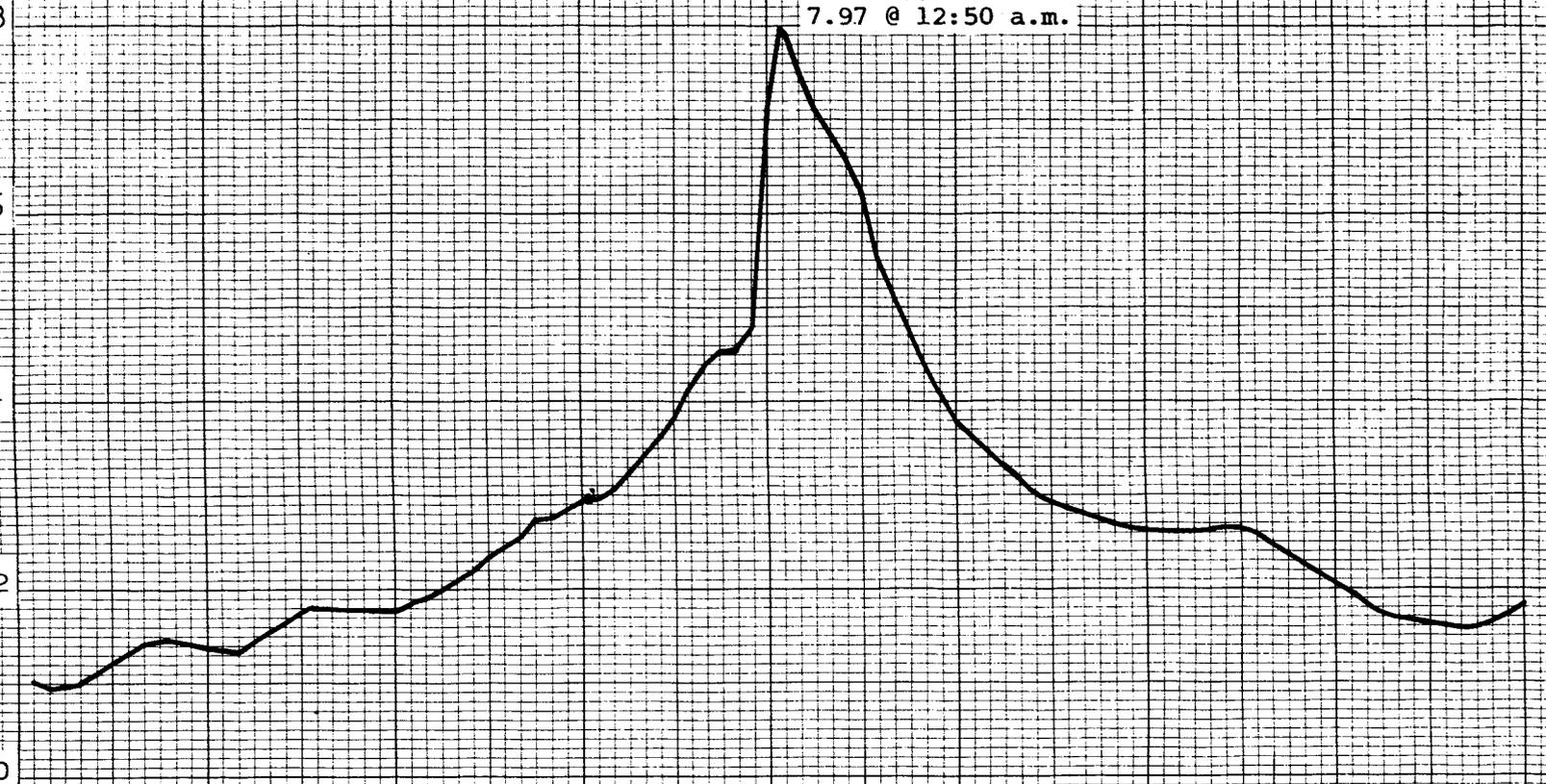
HURRICANE CAMILLE 14-22 AUG. 1969

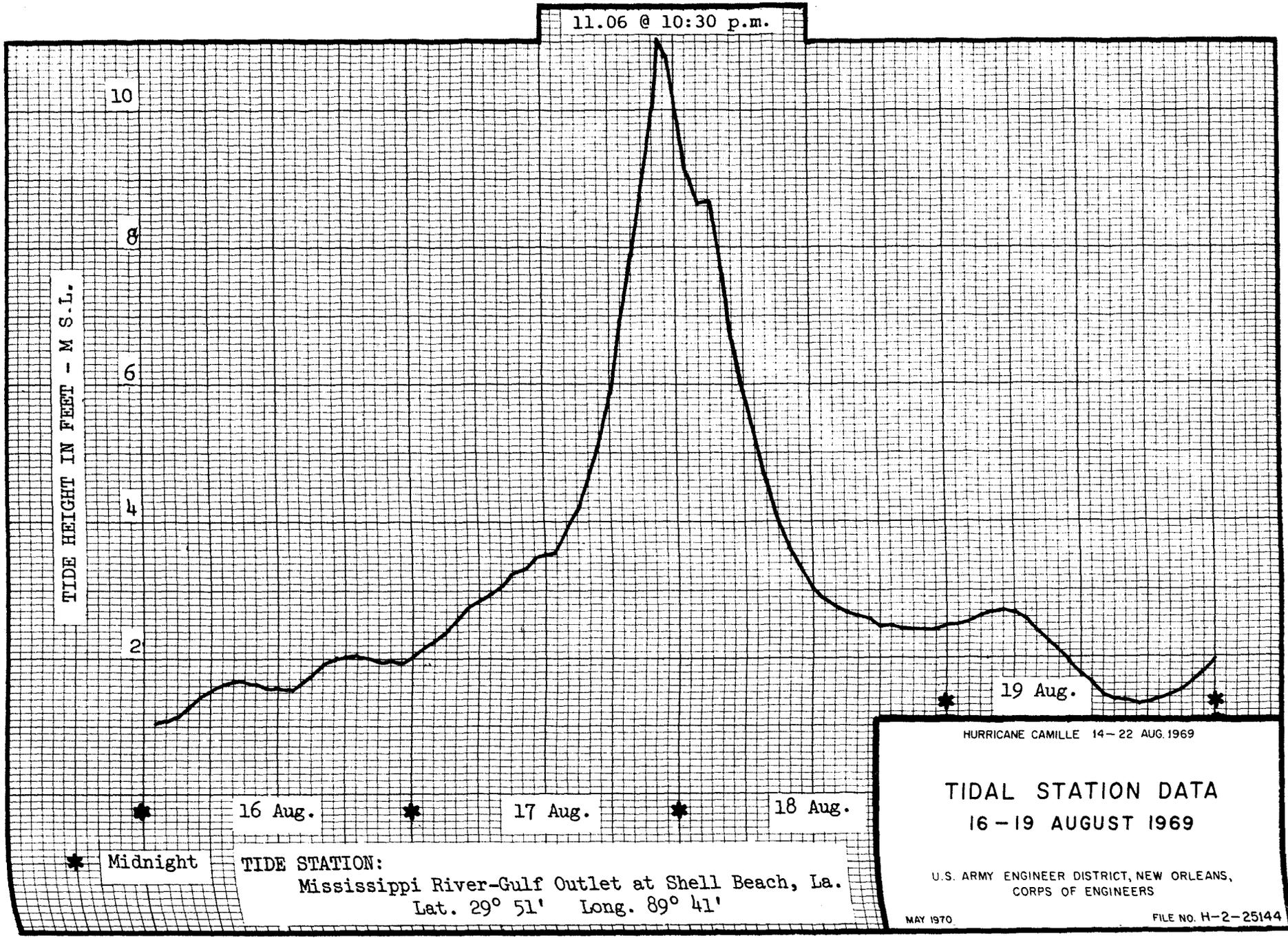
TIDAL STATION DATA
16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144





TIDE HEIGHT IN FEET - M.S.L.

11.30 @ 11:00 p.m.

10

8

6

2

16 Aug.

17 Aug.

18 Aug.

* Midnight

* 19 Aug. *

TIDE STATION:

Mississippi River at Chalmette, La.

Lat. 29° 57' Long. 90° 00'

HURRICANE CAMILLE 14-22 AUG. 1969

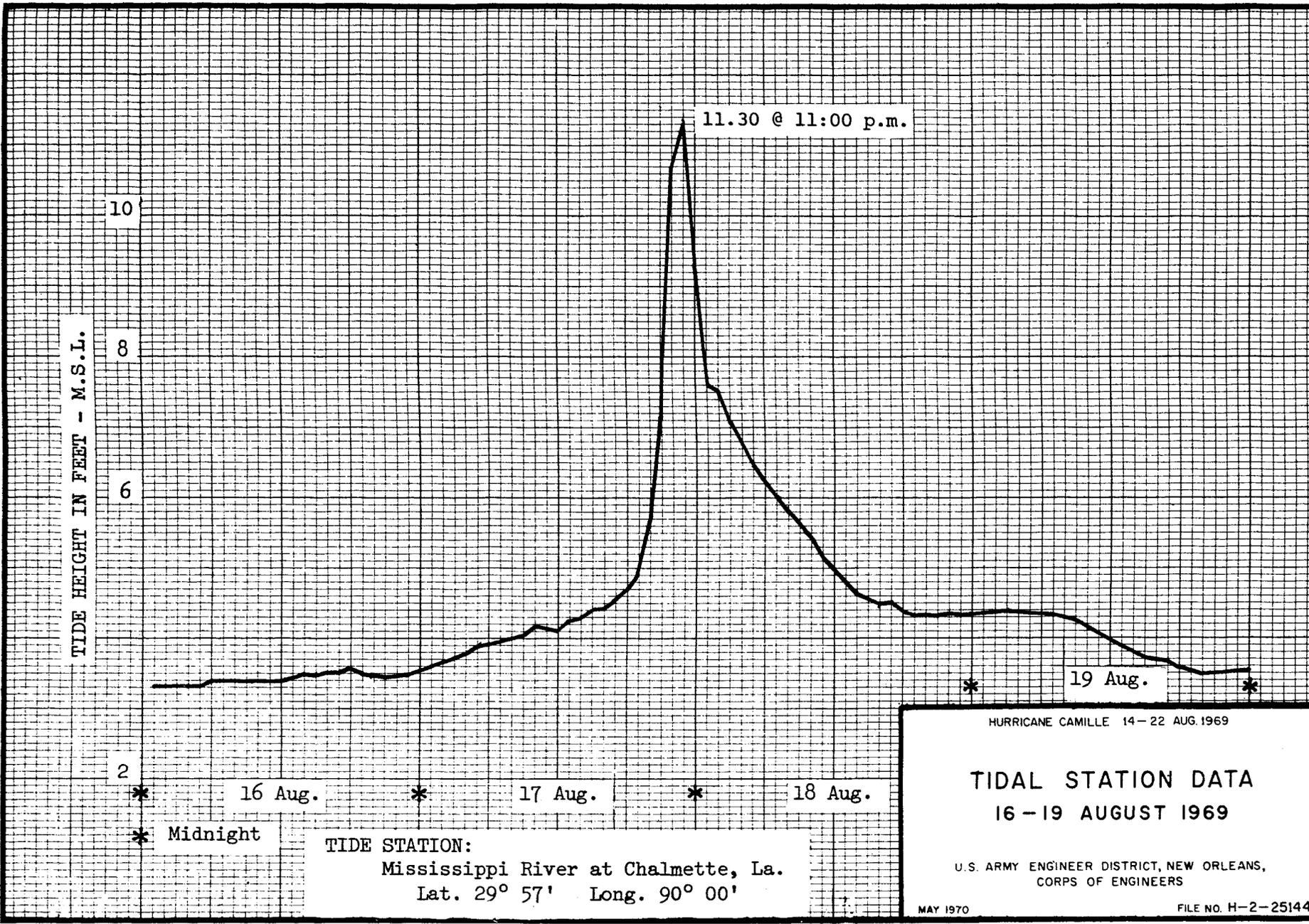
TIDAL STATION DATA

16-19 AUGUST 1969

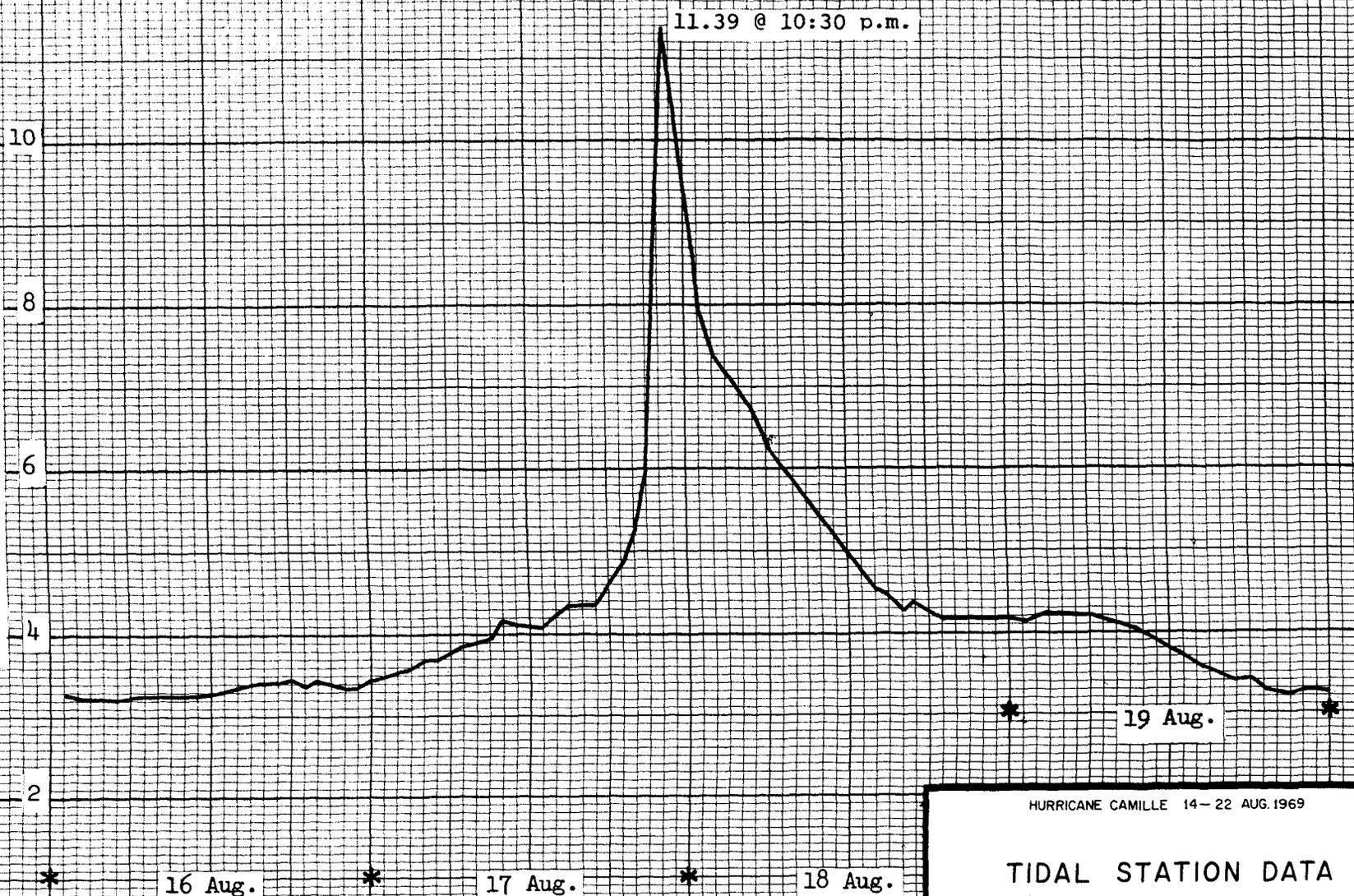
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



TIDE HEIGHT IN FEET - M.S.L.



* Midnight

TIDE STATION:
Mississippi River (GIWW) at Algiers Lock, La.
Lat. 29° 55' Long. 89° 58'

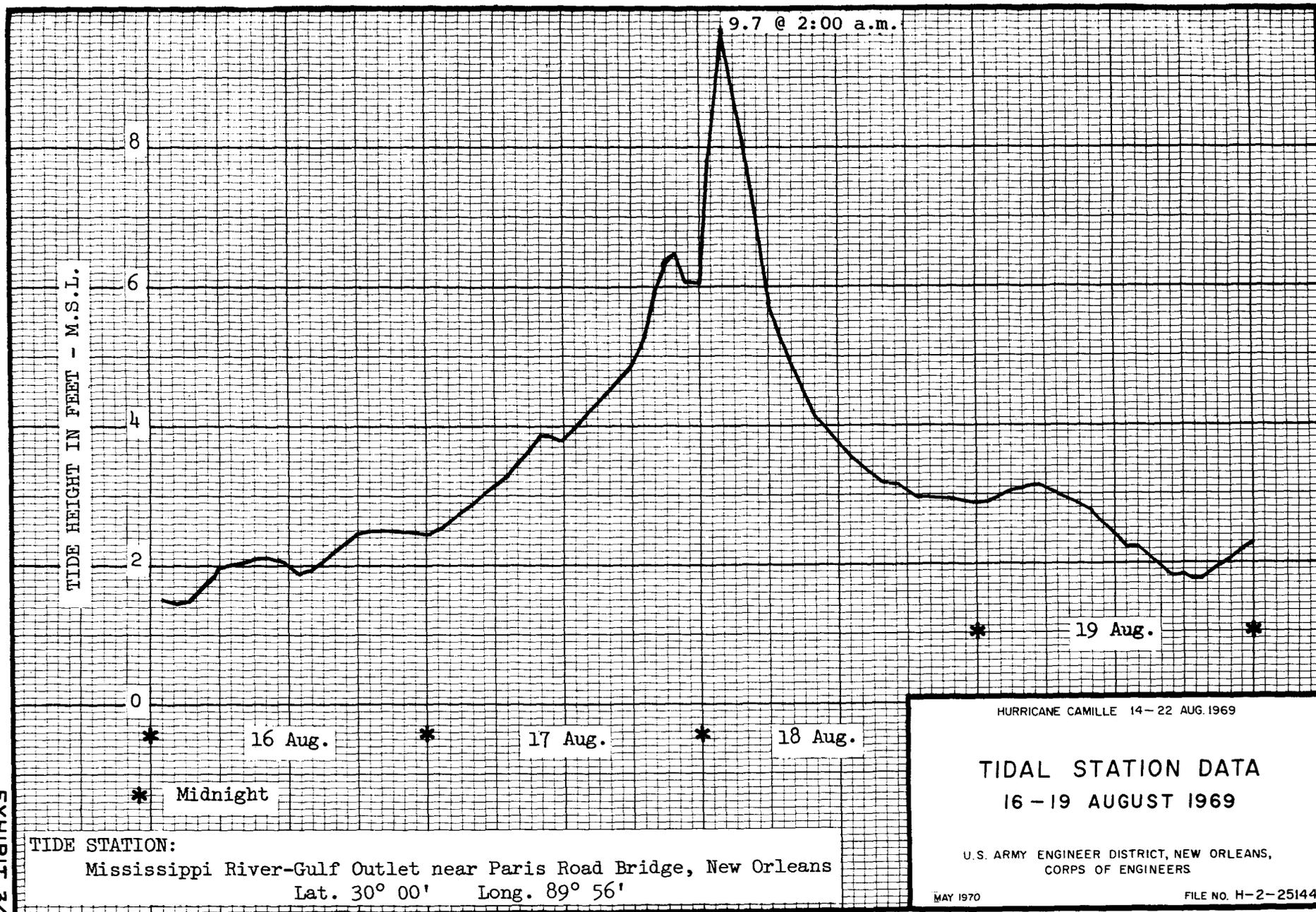
HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



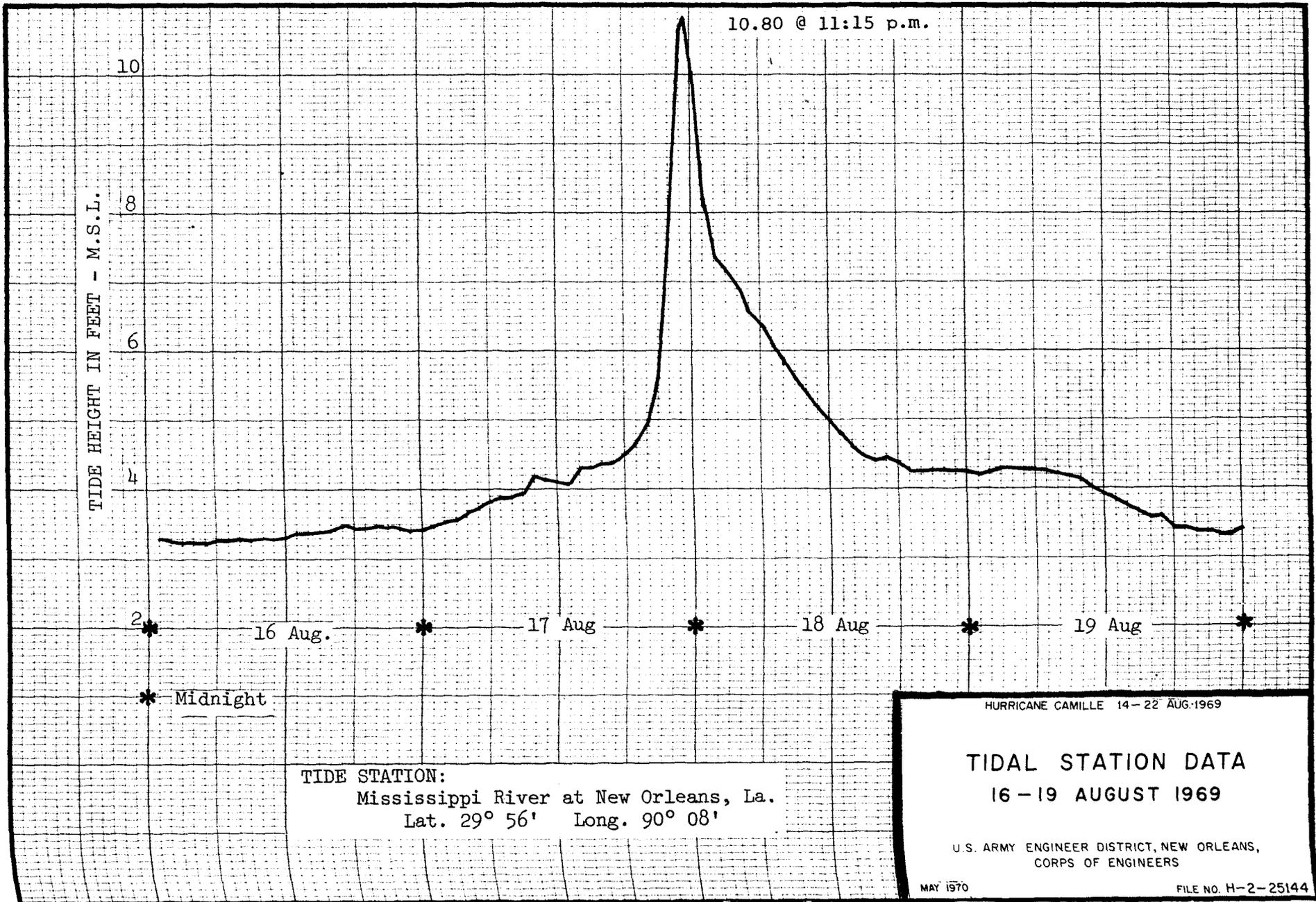
TIDE STATION:
 Mississippi River-Gulf Outlet near Paris Road Bridge, New Orleans
 Lat. 30° 00' Long. 89° 56'

HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
 16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144



TIDE HEIGHT IN FEET - M.S.L.

8

6

4

2

0

6.47 @ 1:15 a.m.

16 Aug.

17 Aug.

18 Aug.

19 Aug.

* Midnight

TIDE STATION:

Inner Harbor Navigation Canal near Seabrook Bridge, New Orleans
 Lat. 30° 02' Long. 90° 02'

HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
 16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

TIDE HEIGHT IN FEET - M.S.L.

8

6

4

2

0

5.15 @ 11:00 p.m.

16 Aug.

17 Aug.

18 Aug.

19 Aug.

Midnight

TIDE STATION:
Lake Pontchartrain at West End, La.
Lat. 30° 01' Long. 90° 07'

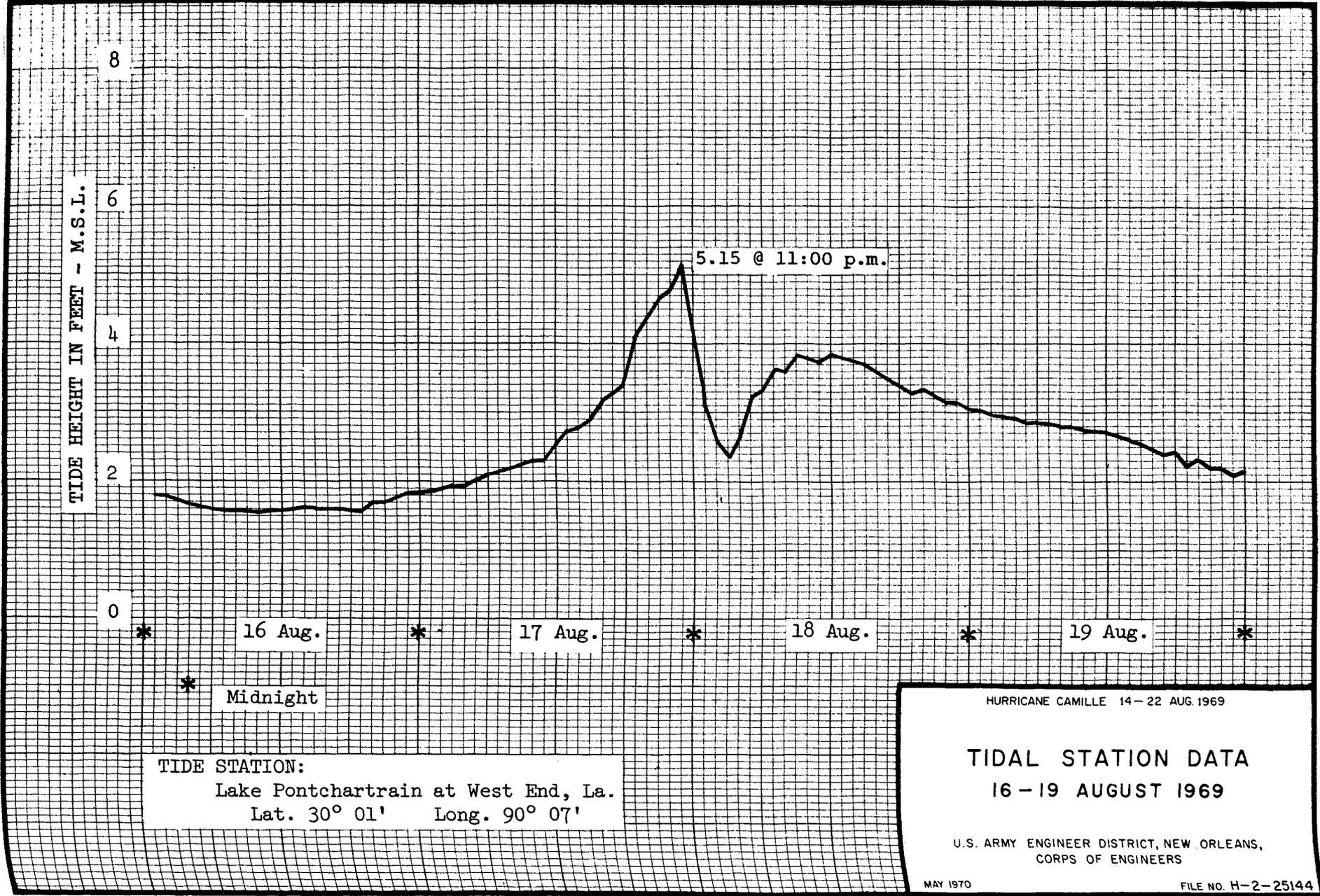
HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



TIDE HEIGHT IN FEET - M.S.L.

8
6
4
2
0

* 16 Aug * 17 Aug * 18 Aug * 19 Aug *

* Midnight

4.06 @ 9:00 a.m.

TIDE STATION:
 Lake Pontchartrain at Midlake near New Orleans, La.
 Lat. 30° 11' Long. 90° 08'

HURRICANE CAMILLE 14-22, AUG. 1969

TIDAL STATION DATA
 16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144

TIDE HEIGHT IN FEET - M.S.L.

8
6
4
2
0

* 16 Aug. *

* Midnight

17 Aug. *

* 18 Aug. *

* 19 Aug. *

4.56 @ 5:40 a.m.

TIDE STATION:
Lake Pontchartrain at Mandeville, La.
Lat. 30° 22' Long. 90° 06'

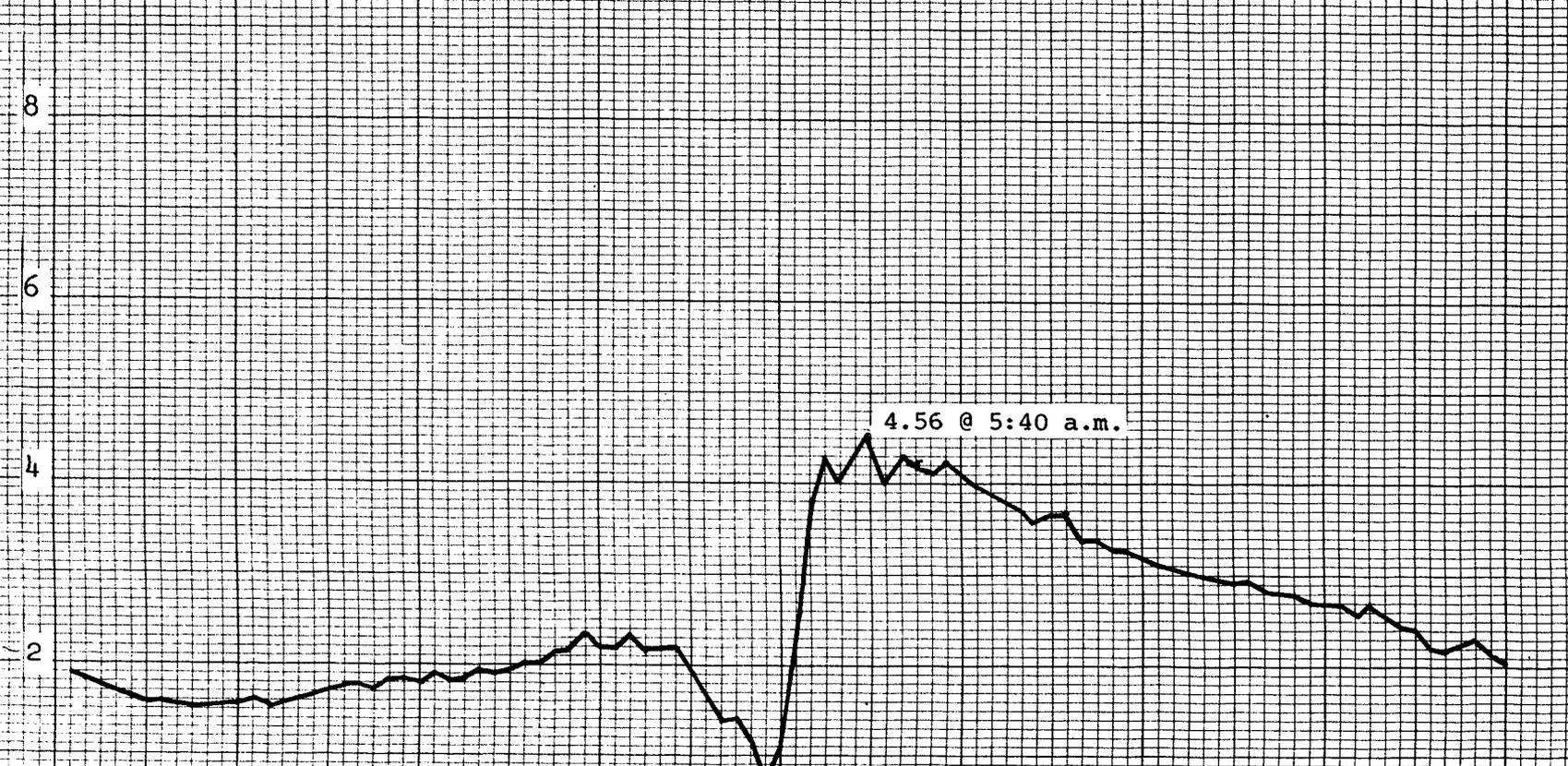
HURRICANE CAMILLE 14-22 AUG. 1969

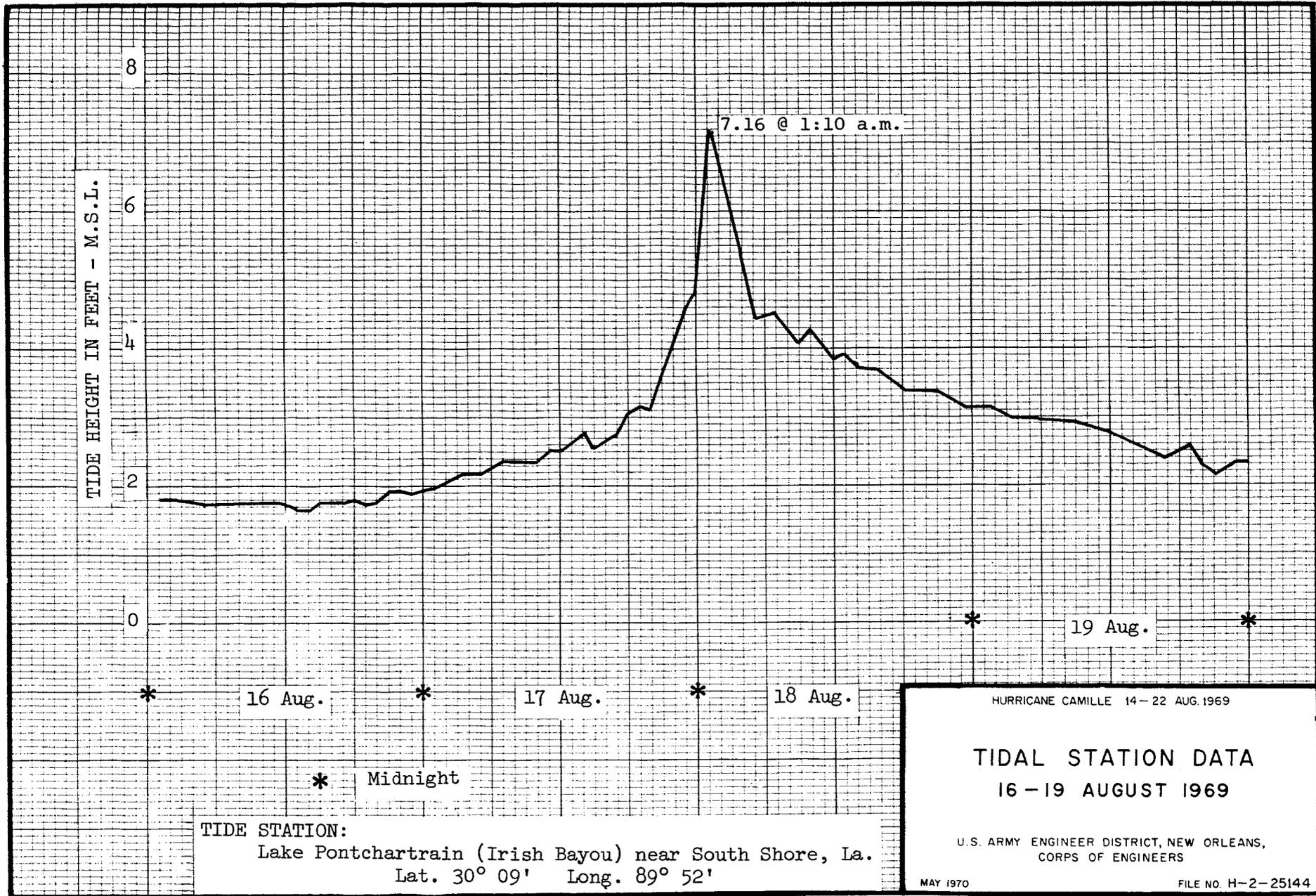
TIDAL STATION DATA
16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144





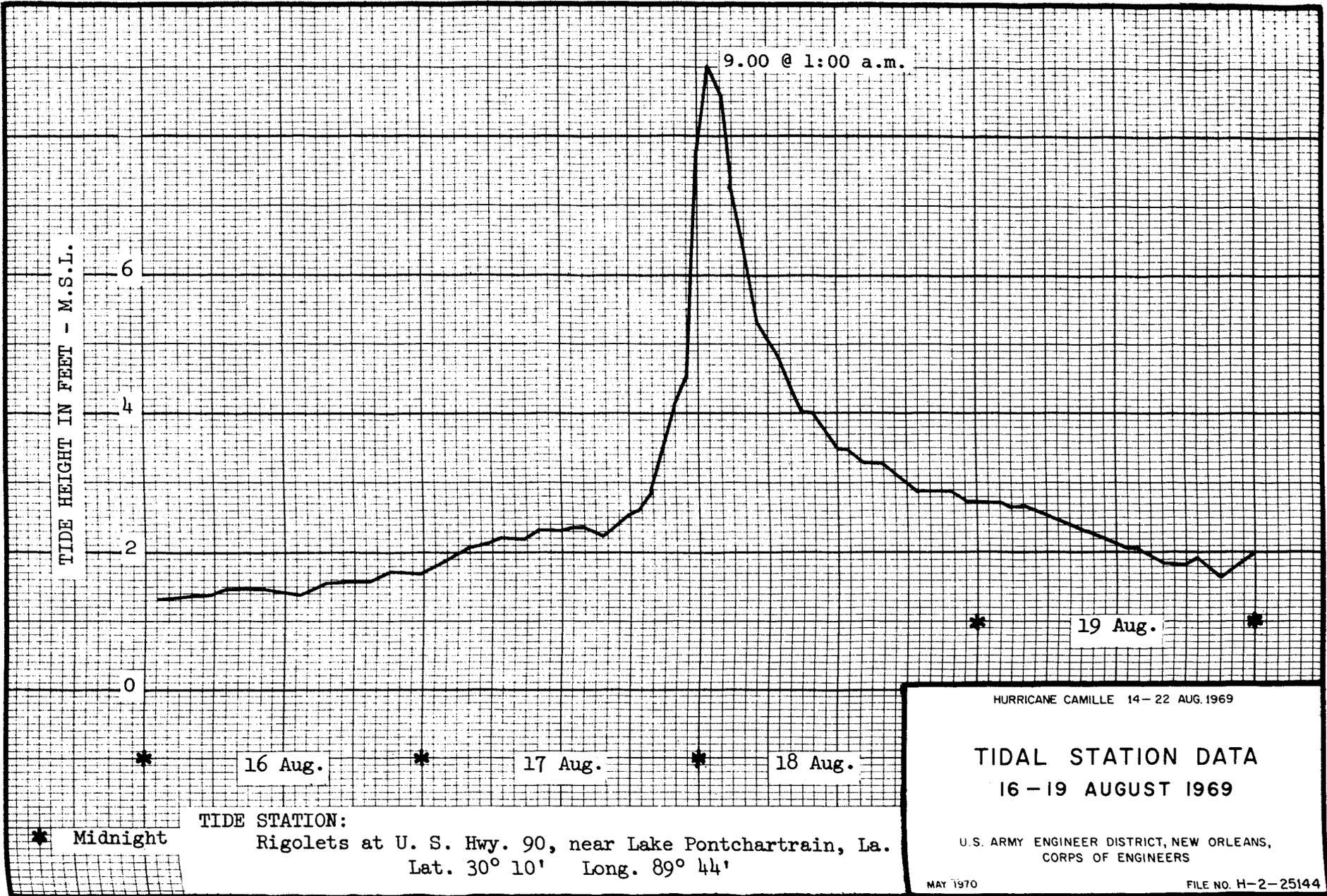
TIDE STATION:
 Lake Pontchartrain (Irish Bayou) near South Shore, La.
 Lat. 30° 09' Long. 89° 52'

HURRICANE CAMILLE 14-22 AUG. 1969

TIDAL STATION DATA
 16-19 AUGUST 1969

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144



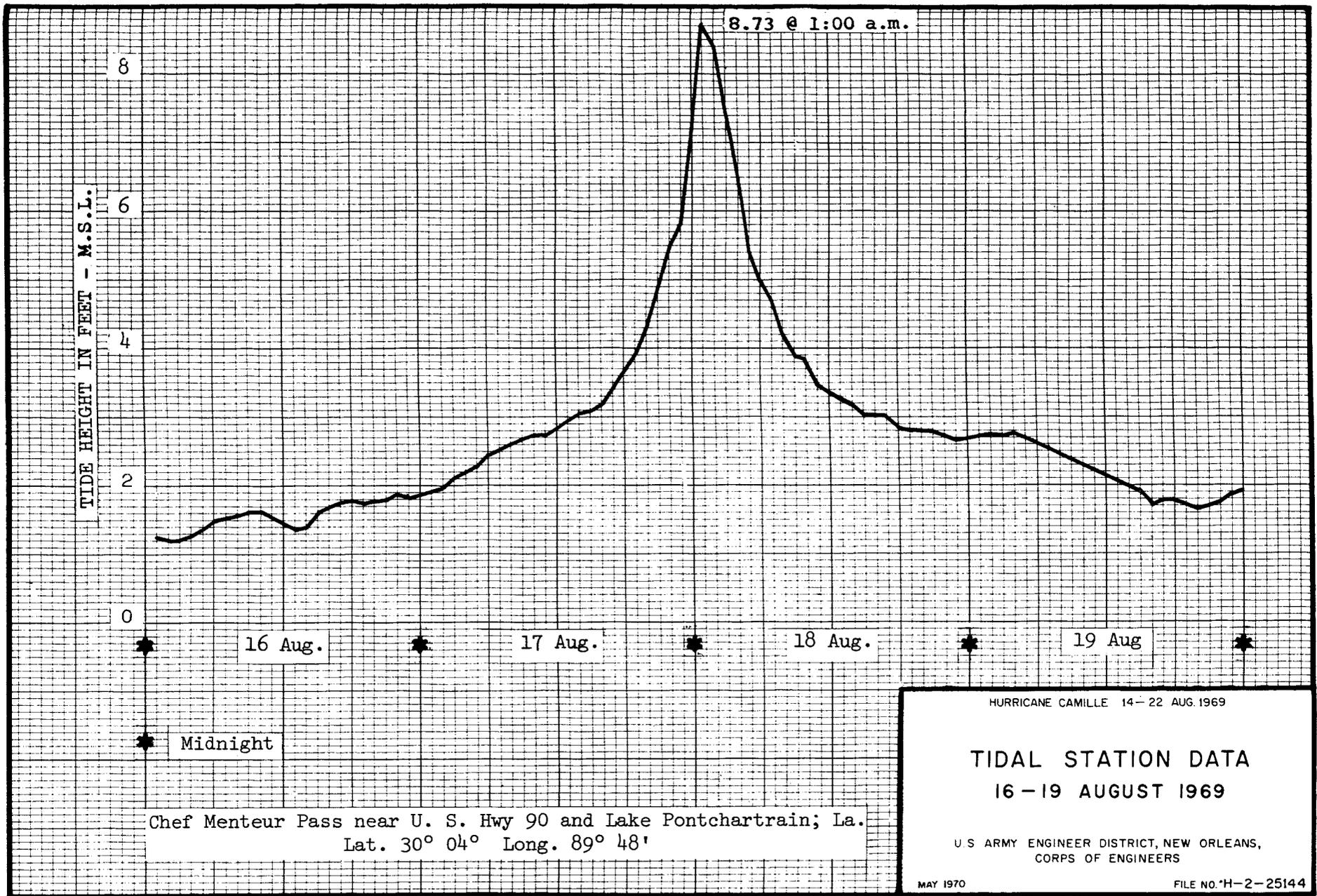


EXHIBIT 43

HURRICANE CAMILLE

SALINITY DATA

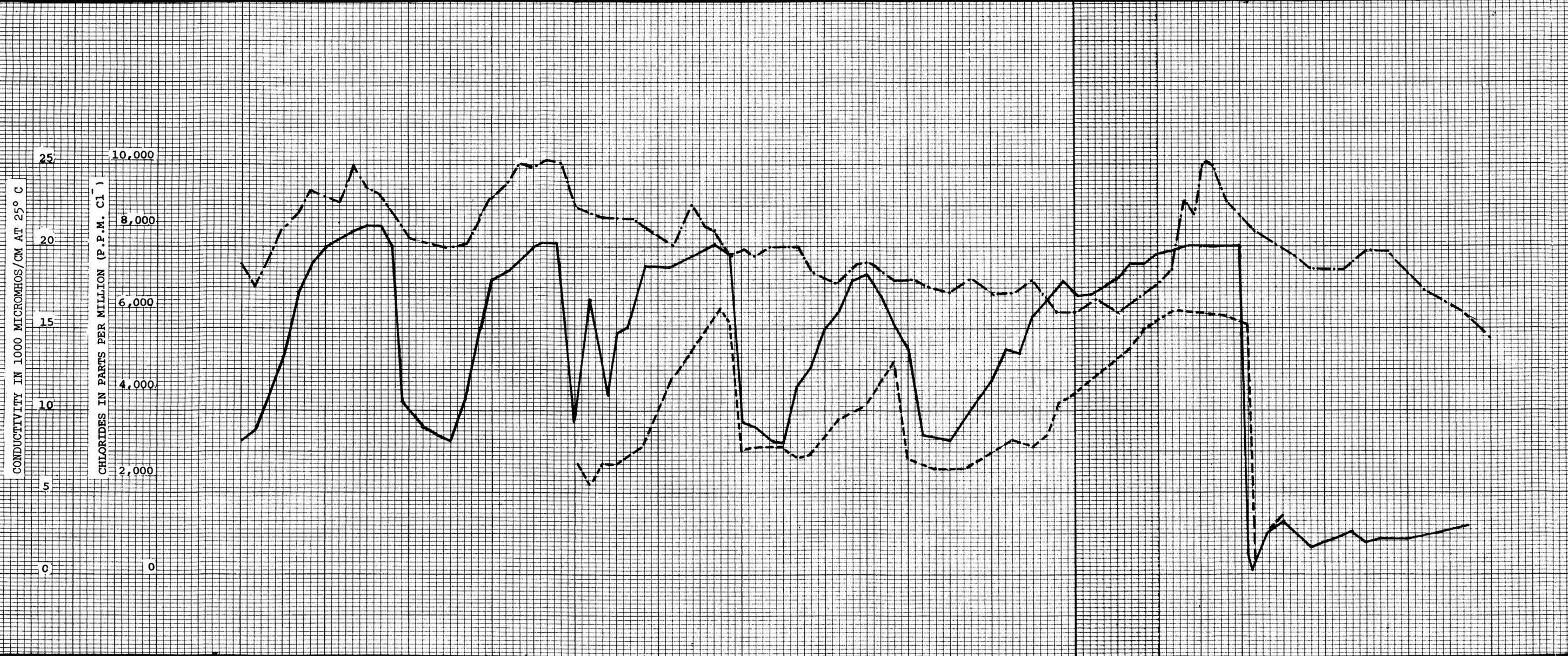
Chlorides in Parts Per Million of Chloride Ion (Cl^-)

Station Location	August 1969									
	14	15	16	17	18	19	20	21	22	
<u>Lake Pontchartrain and Vicinity</u>										
Pass Manchac	1,350	1,450	1,400	1,450	1,300	1,500	1,275	1,000	825	
Little Woods	NR	NR	NR	NR	NR	8,500	3,500	3,250	3,750	
Chef Menteur	4,500	4,500	4,500	4,000	4,500	7,000	4,250	3,500	3,250	
Hopedale	9,250	8,750	8,750	10,750	6,500	6,500	6,500	6,500	6,750	
<u>Bayou Barataria</u>										
Lafitte, La.	575	600	625	500	475	1,475	1,450	850	825	
<u>Bayou Lafourche</u>										
LaRose, La.	150	120	130	150	NR	NR	325	400	150	
Golden Meadow, La.	130	130	130	NR	NR	120	150	180	180	
Leeville, La.	7,000	7,000	6,000	8,750	8,750	8,000	8,000	6,500	6,500	
<u>Gulf Intracoastal Waterway and Vicinity</u>										
Houma Nav. Canal near Crozier, La.	85	90	85	90	90	250	135	130	145	
Bayou Terrebonne at Houma, La.	145	110	175	155	115	100	95	95	90	
Bayou Petite Caillou near Boudreaux, La.	850	625	875	NR	2,750	3,500	3,500	1,750	975	
Bayou Grand Caillou near Dulac, La.	200	160	160	180	140	105	105	1,200	1,100	
Bayou Terrebonne near Bourg, La.	130	130	130	130	130	500	1,600	250	160	

Note: NR, no record.

AUGUST 1969

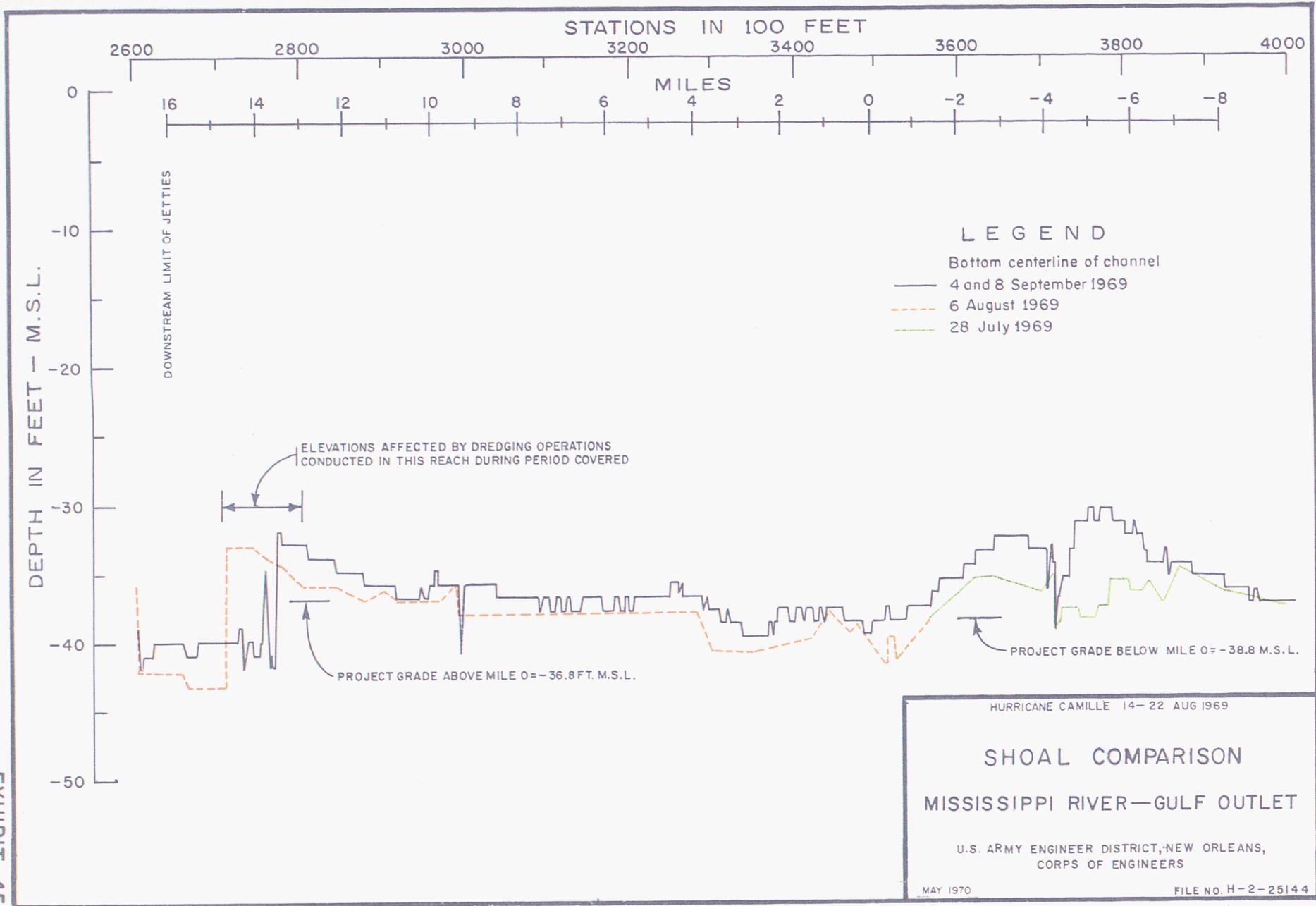
11 * 12 * 13 * 14 * 16 * 17 * 18 * 19 *



LEGEND
 - - - - - Seabrook Bridge - 5 ft. #
 _____ Seabrook Bridge - 15 ft. #
 - . - . - Paris Road - 10 ft. #
 * Midnight
 # Depths below water surface at which readings were taken

HURRICANE CAMILLE 14 - 22 AUG. 1969
 COMPARATIVE CONDUCTIVITY (SALINITY) DATA
 12 - 19 AUGUST 1969
 U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
 CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144



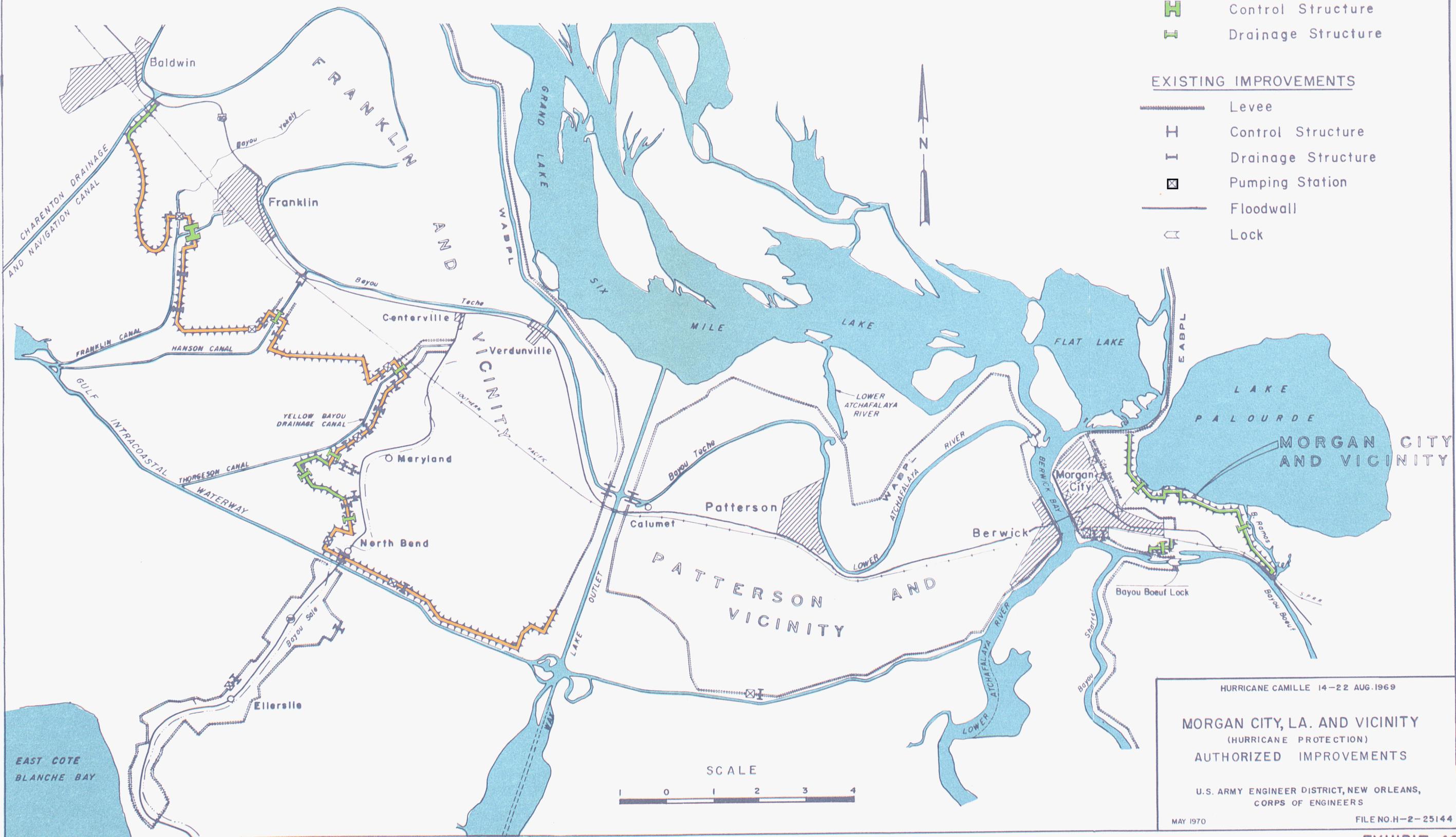
LEGEND

AUTHORIZED IMPROVEMENTS

-  New Levee
-  Levee Enlargement
-  Control Structure
-  Drainage Structure

EXISTING IMPROVEMENTS

-  Levee
-  Control Structure
-  Drainage Structure
-  Pumping Station
-  Floodwall
-  Lock

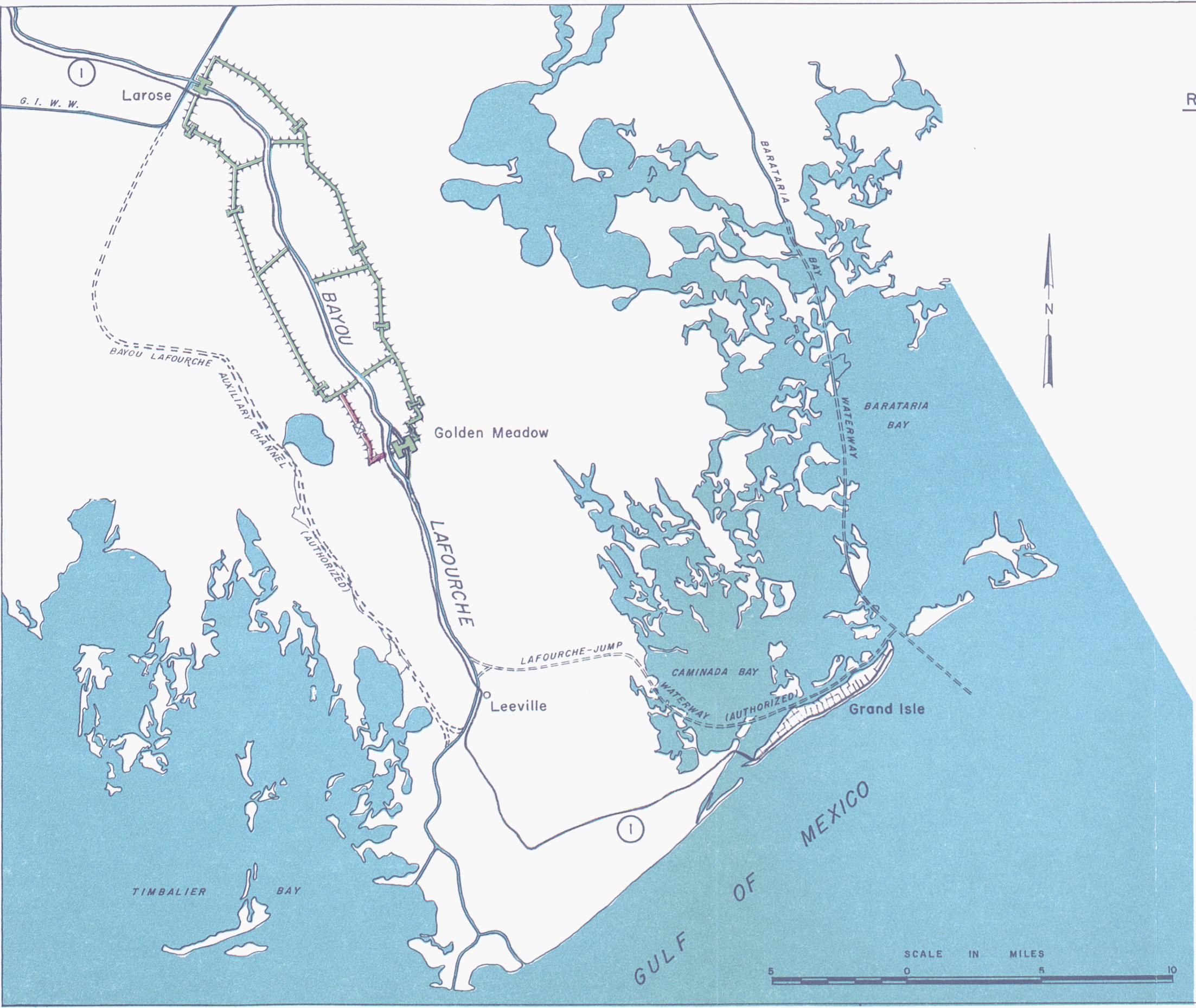


HURRICANE CAMILLE 14-22 AUG. 1969

MORGAN CITY, LA. AND VICINITY
(HURRICANE PROTECTION)
AUTHORIZED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144



LEGEND

RECOMMENDED IMPROVEMENTS

- New Levee
- Levee Enlargement
- Flood Gate (Control Structure)
- Drainage Structure
- Channel

EXISTING IMPROVEMENTS

- Pumping Station

HURRICANE CAMILLE 14-22 AUG. 1969

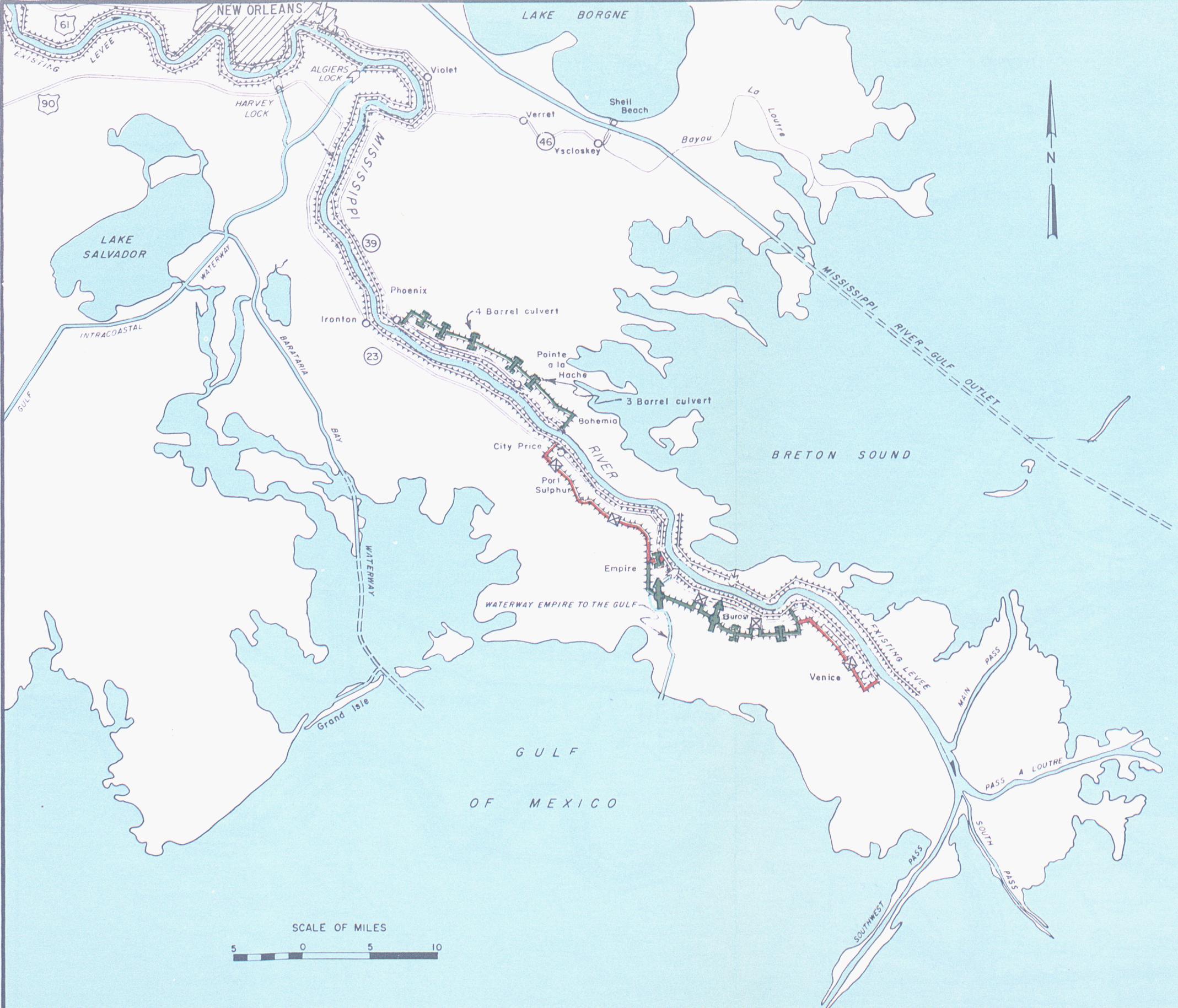
GRAND ISLE, LA. AND VICINITY
(HURRICANE PROTECTION)

AUTHORIZED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970

FILE NO. H-2-25144



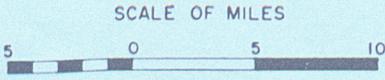
LEGEND

AUTHORIZED IMPROVEMENTS

-  New Levee
-  Levee Enlargement
-  Drainage Structure
-  Navigation Structure

EXISTING IMPROVEMENTS

-  Levee
-  Pumping Station
-  Lock

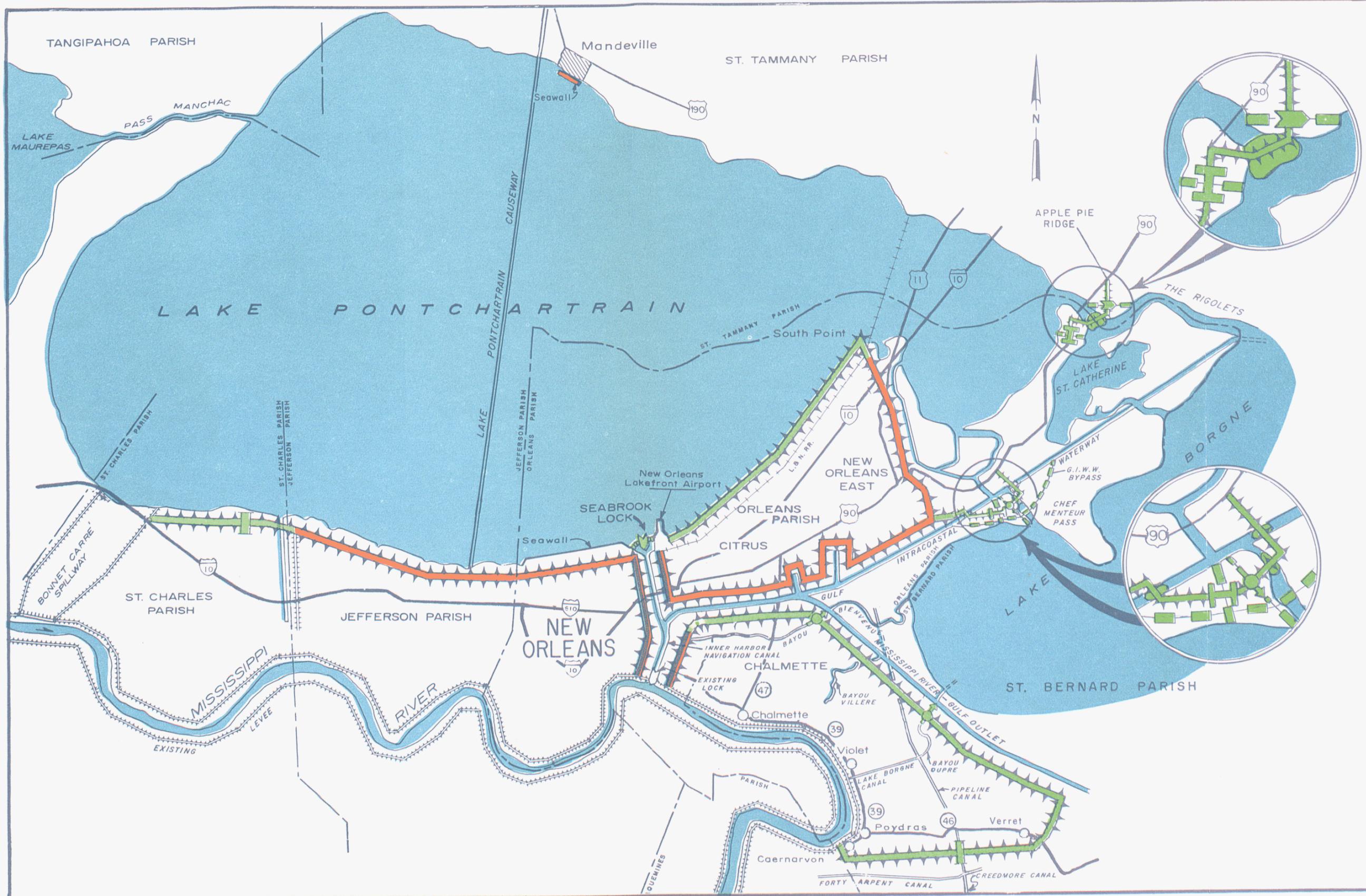


HURRICANE CAMILLE 14-22 AUG. 1969

NEW ORLEANS TO VENICE, LA.
(HURRICANE PROTECTION)
AUTHORIZED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144



LEGEND

AUTHORIZED IMPROVEMENTS

- New Levee
- Levee Enlargement or Modification
- Control Structure
- Drainage Structure
- Lock
- Floodgate
- Navigation Channel
- Floodwall
- Seawall Strengthening
- Rock Fill

EXISTING IMPROVEMENTS

- Levee
- Seawall



HURRICANE CAMILLE 14-22 AUG. 1969

LAKE PONTCHARTRAIN AND VICINITY, LA.
(HURRICANE PROTECTION)

AUTHORIZED IMPROVEMENTS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

MAY 1970 FILE NO. H-2-25144





HURRICANE CAMILLE 14-22 AUG 1969
**BOOTHVILLE, LOUISIANA
BEFORE "CAMILLE"**
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS
MAY 1970 FILE NO. H-2-25144

SCALE IN FEET
500 0 500

NOTE:
Uncontrolled mosaic prepared from aerial photos
flown 12 December 1967.



HURRICANE CAMILLE 14-22 AUG 1969
**BOOTHVILLE, LOUISIANA
AFTER "CAMILLE"**
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS
MAY 1970 FILE NO. H-2-25144

SCALE IN FEET
500 0 500

NOTE:
Uncontrolled mosaic prepared from aerial photos
flown 11 September 1969.

APPENDIX I

**U. S. WEATHER BUREAU
ADVISORIES AND BULLETINS
ON
HURRICANE CAMILLE**

**Preliminary Report
(Pages 5 through 22)**

A UNITED STATES
DEPARTMENT OF
COMMERCE
PUBLICATION

U.S. DEPARTMENT OF COMMERCE
Environmental Science Services Administration
Weather Bureau



HURRICANE CAMILLE

AUGUST 14-22, 1969

(Preliminary Report)

NATIONAL HURRICANE CENTER MIAMI

ADVISORY NO. 1 1 PM EDT THURSDAY AUGUST 14, 1969

...TROPICAL STORM CAMILLE FORMS RAPIDLY NEAR GRAND CAYMAN IN THE CARIBBEAN...

A NAVY RECON PLANE RECONNOITERING A TROPICAL WAVE IN THE CARIBBEAN THIS MORNING ENCOUNTERED A RAPIDLY DEVELOPING DEPRESSION WHICH REACHED STORM INTENSITY WHILE THE AIRCRAFT WAS STILL IN THE AREA.

AT 1 PM EDT...1700Z... THE NEW STORM ... TO BE KNOWN AS CAMILLE... WAS LOCATED NEAR LATITUDE 19.3 NORTH...LONGITUDE 82.3 WEST. THIS IS ABOUT 60 MILES WEST OF GRAND CAYMAN OR 480 MILES SOUTH OF MIAMI.

CAMILLE IS MOVING WEST NORTHWESTWARD 12 TO 14 MPH WITH STRONGEST WINDS ABOUT 60 MPH OVER A VERY SMALL AREA NEAR THE CENTER.

CAMILLE IS EXPECTED TO MOVE ON A CURVING PATH TO THE NORTHWEST REACHING THE VICINITY OF THE WEST TIP OF CUBA EARLY FRIDAY MORNING. CONDITIONS FAVOR RAPID INTENSIFICATION OF THIS YOUNG STORM.

GALE FORCE WINDS IN SQUALLS WILL AFFECT THE ISLE OF PINES BY MIDNIGHT AND EXTREME WEST CUBA BEFORE DAYBREAK TOMORROW. TIDES ON THE SOUTH COAST OF CUBA WILL RANGE 3 TO 5 FEET ABOVE NORMAL...AND HEAVY RAINS MAY AFFECT MUCH OF WEST CUBA.

THE FUTURE COURSE AND DEVELOPMENT OF CAMILLE WILL NOT BECOME CLEAR UNTIL FURTHER RECONNAISSANCE IS COMPLETED LATER THIS AFTERNOON. HOWEVER ALL INTERESTS IN SOUTH FLORIDA AND THE KEYS SHOULD BE ALERT TO ADVICES LATER TODAY WHICH MAY REQUIRE RAPID PROTECTIVE ACTION IN SOME AREAS.

REPEATING THE 1PM EDT POSITION...19.3 NORTH...82.3 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6 PM EDT TODAY.

SIMPSON

BULLETIN 3 PM EDT THURSDAY AUGUST 14, 1969

AT 3 PM EDT...1900Z...TROPICAL STORM CAMILLE WAS CENTERED NEAR LATITUDE 19.5 NORTH...LONGITUDE 82.5 WEST. THIS POSITION IS 460 MILES SOUTH SOUTHWEST OF MIAMI AND NEARLY 140 MILES SOUTH OF THE SOUTH COAST OF THE ISLE OF PINES.

CAMILLE IS MOVING ON A NORTHWESTERLY COURSE 12 TO 14 MPH AND CONDITIONS FAVOR INTENSIFICATION TO A HURRICANE. AS OF MID AFTERNOON ...HIGHEST WINDS ARE ESTIMATED 50 TO 60 MPH MAINLY NEAR THE CENTER IN THE NORTHEAST PORTION OF THE STORM.

THE STORM FORMED JUST WEST OF GRAND CAYMAN AND WHILE SHOWERS AND SQUALLS HAVE BEEN REPORTED OVER THE ISLAND...NO DAMAGE REPORTS HAVE COME IN TO THE NATIONAL HURRICANE CENTER.

THE FORECAST TRACK WOULD TAKE CAMILLE ON A NORTHWESTERLY COURSE...AND POSSIBLY LATER...A MORE NORTHERLY COURSE. THE ISLE OF PINES AND WESTERN CUBA IS DEFINITELY THREATENED BY STORM CAMILLE. PRECAUTIONS AGAINST GALE WINDS...HEAVY RAINS...RISING TIDES... AND THE POSSIBILITY OF HURRICANE CONDITIONS SHOULD BE TAKEN ON THE ISLE OF PINES AND OVER THE EXTREME WESTERN TIP OF CUBA BEFORE SUNDOWN.

ALL INTERESTS IN THE ISLE OF PINES...WESTERN CUBA...FLORIDA KEYS...THE YUCATAN...AND THE SOUTHEAST GULF OF MEXICO SHOULD KEEP IN CLOSE TOUCH WITH ALL ADVISORIES AND BULLETINS.

REPEATING THE 3 PM EDT POSITION...19.5 NORTH...82.5 WEST.

SUGG

ADVISORY NO. 2 6 PM EDT THURSDAY AUGUST 14, 1969

...YOUNG CAMILLE ADVANCES SLOWLY TOWARD THE GULF OF MEXICO...

NO FURTHER REPORTS HAVE BEEN RECEIVED FROM THE DEVELOPING CENTRAL AREAS OF CAMILLE DURING THE AFTERNOON AND BOTH THE MOVEMENT AND PRESENT INTENSITY MUST BE INFERRED FROM ISLAND STATION REPORTS. AT 6 PM EDT...2200Z...CAMILLE WAS LOCATED APPROXIMATELY AT LATITUDE 19.9 NORTH...LONGITUDE 83.0 WEST OR ABOUT 440 MILES SOUTH SOUTHWEST OF MIAMI. IT IS APPARENTLY MOVING NORTHWEST ABOUT 12 MPH. BASED UPON THE ESSA 9 SATELLITE PICTURE JUST RECEIVED THE STORM HAS NOT SIGNIFICANTLY INCREASED IN INTENSITY DURING THE LAST 6 HOURS AND STRONGEST WINDS ARE ESTIMATED TO BE 60 TO 65 MPH OVER A SMALL AREA NEAR THE CENTER. GALES EXTEND OUTWARD 70 TO 100 MILES IN THE NORTHERN SEMICIRCLE OF THE STORM.

INDICATIONS ARE THAT CAMILLE WILL PASS NEAR THE WESTERN TIP OF CUBA TONIGHT OR EARLY FRIDAY MORNING MOVING NORTHWESTWARD ABOUT 10 TO 12 MPH. WHILE IT IS TOO EARLY TO DETERMINE WHAT FURTHER LAND AREAS MAY BE AFFECTED BY THIS STORM THE STEERING CURRENTS INDICATE THE LIKELIHOOD OF A TURN TO A SLIGHTLY MORE NORTHERLY COURSE FRIDAY. THIS WOULD CARRY THE CENTER INTO THE EAST CENTRAL GULF OF MEXICO THIS WEEK END.

ALL INTERESTS IN THE FLORIDA KEYS AND SHIPPING IN THE VICINITY OF THE YUCATAN CHANNEL AND THE EASTERN GULF OF MEXICO SHOULD REMAIN ALERT FOR FURTHER ADVICES CONCERNING THE DEVELOPMENT AND MOVEMENT OF CAMILLE. WHILE THIS IS A VERY SMALL STORM AT PRESENT... CONDITIONS ARE FAVORABLE FOR FURTHER DEVELOPMENT.

ALL INTERESTS IN WESTERN CUBA SHOULD BE PREPARED FOR WINDS OF GALE FORCE IN SQUALLS AND THE POSSIBILITY OF HEAVY RAINS AND FLASH FLOODS TONIGHT WITH TIDES ALONG THE SOUTHWEST COASTLINE 3 TO 5 FEET ABOVE NORMAL.

REPEATING THE 6 PM EDT POSITION...19.9 NORTH...83.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT MIDNIGHT EDT.

SIMPSON

BULLETIN 9 PM EDT THURSDAY AUGUST 14, 1969

...NO IMPORTANT CHANGE IN CAMILLE DURING THE EARLY EVENING HOURS...

...THE MIDNIGHT ADVISORY WILL BE BASED UPON AIRCRAFT RECONNAISSANCE BY THE NAVY...

AT 9 PM EDT...0100Z...THE CENTER OF STORM CAMILLE WAS ESTIMATED NEAR LATITUDE 20.3 NORTH...LONGITUDE 83.4 WEST. THIS POSITION IS 440 MILES SOUTH SOUTHWEST OF MIAMI AND NEARLY 85 MILES SOUTH SOUTHWEST OF THE SOUTH COAST OF THE ISLE OF PINES.

CAMILLE IS MOVING ON A NORTHWESTERLY COURSE NEAR 10 MPH. ANY CHANGE IN DIRECTION LATER TONIGHT OR FRIDAY WOULD LIKELY BE TOWARDS THE NORTH. THIS WOULD MEAN THAT THE ISLE OF PINES AND THE EXTREME WESTERN PORTION OF CUBA ARE THE AREAS MOST LIKELY TO GET GALE WINDS...HIGH TIDES...AND HEAVY RAINS LATE TONIGHT AND FRIDAY.

WHILE THERE HAVE BEEN NO REPORTS TO INDICATE THAT WINDS ARE HIGHER THAN 60 TO 65 MPH NEAR THE CENTER...CONDITIONS FAVOR SOME INTENSIFICATION.

PRECAUTIONS SHOULD BE CONTINUED ON THE ISLE OF PINES AND WESTERN CUBA AND ALL INTERESTS IN THESE AREAS...INCLUDING THE FLORIDA KEYS...THE YUCATAN...AND THE SOUTHEAST GULF OF MEXICO SHOULD KEEP IN CLOSE TOUCH WITH FUTURE ADVISORIES AND BULLETINS.

HEAVY RAINS HAVE OCCURRED ON GRAND CAYMAN AND WIND GUSTS ON THAT ISLAND REACHED 48 MPH. NO REPORTS OF DAMAGE HAVE BEEN RECEIVED AT THE NATIONAL HURRICANE CENTER.

REPEATING THE 9 PM EDT POSITION...20.3 NORTH...83.4 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER IN MIAMI AT MIDNIGHT.

SUGG

ADVISORY NO. 3 12 MIDNIGHT EDT FRIDAY AUGUST 15, 1969

...CAMILLE TAKES A MORE NORTHERLY COURSE...

A NAVY RECONNAISSANCE PLANE LATE THIS EVENING INDICATED THAT CAMILLE IS MOVING ON A MORE NORTHERLY COURSE THAN INDICATED IN THE PREVIOUS ADVICES. AT MIDNIGHT EDT...0400Z...THE CENTER OF THE STORM WAS RELOCATED NEAR LATITUDE 20.3 NORTH...LONGITUDE 82.4 WEST THIS POSITION IS 410 MILES SOUTH SOUTHWEST OF MIAMI AND AROUND 85 MILES SOUTH OF THE SOUTH COAST OF THE ISLE OF PINES.

THERE HAS BEEN NO SIGNIFICANT CHANGE IN INTENSITY AND MAXIMUM WINDS ARE 60 TO 65 MPH NEAR THE CENTER.

CAMILLE IS EXPECTED TO MOVE TOWARDS THE NORTH NORTHWEST AROUND 10 MPH SWEEPING ACROSS THE ISLE OF PINES EARLY FRIDAY AND WESTERN CUBA LATER IN THE DAY. GALE WINDS...HIGH TIDES...AND HEAVY RAINS WILL BEGIN ON THE ISLE OF PINES LATER TONIGHT AND THE SOUTHWEST COAST OF CUBA FRIDAY MORNING. CONDITIONS FAVOR SOME INTENSIFICATION AND WINDS COULD ATTAIN HURRICANE FORCE BEFORE CAMILLE MOVES INLAND.

INTEREST IN THE FLORIDA KEYS SHOULD KEEP IN CLOSE TOUCH WITH FUTURE ADVISORIES AND BULLETINS. SMALL BOATS IN THE FLORIDA KEYS SHOULD NOT VENTURE INTO OPEN WATER.

REPEATING THE MIDNIGHT EDT POSITION...20.3 NORTH...82.4 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6 AM EDT WITH AN INTERMEDIATE BULLETIN AT 3 AM EDT.

FRANK

BULLETIN 3 AM EDT FRIDAY AUGUST 15, 1969

...CAMILLE PLODDING TOWARD THE ISLE OF PINES AND EXTREME WESTERN CUBA...

AT 3 AM EDT THE CENTER OF TROPICAL STORM CAMILLE WAS ESTIMATED NEAR LATITUDE 20.5 NORTH... LONGITUDE 83.0 WEST OR ABOUT 60 MILES SOUTH OF THE ISLE OF PINES. THE STORM IS MOVING TOWARD THE NORTH NORTHWEST ABOUT 10 MILES PER HOUR AND IS EXPECTED TO CONTINUE THIS MOVEMENT TODAY.

HIGHEST WINDS ARE ESTIMATED 65 MPH NEAR THE CENTER AND GALES SHOULD ALREADY BE FELT ON THE SOUTH COAST OF THE ISLE OF PINES. CAMILLE IS EXPECTED TO REACH HURRICANE FORCE THIS MORNING.

ALL INTERESTS IN WESTERN CUBA AND THE ISLE OF PINES SHOULD TAKE PRECAUTIONS AGAINST GALE AND POSSIBLY HURRICANE FORCE WINDS... HEAVY RAINS OF 5 TO 10 INCHES... AND HIGH TIDES OF UP TO 6 FEET.

SMALL CRAFT AROUND THE FLORIDA KEYS SHOULD NOT VENTURE FAR FROM PORT AND THOSE AROUND WESTERN CUBA SHOULD BE IN SAFE HARBOR.

REPEATING THE 3 AM EDT POSITION... 20.5 NORTH...83.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6AM EDT.

PELLISSIER

ADVISORY NO. 4 6 AM EDT FRIDAY AUGUST 15, 1969

...CAMILLE HEADS TOWARD EXTREME WESTERN CUBA...

AT 6AM EDT...1000Z... TROPICAL STORM CAMILLE WAS NEAR LATITUDE 20.8 NORTH LONGITUDE 83.7 WEST OR ABOUT 100 MILES SOUTHEAST OF CAPE SAN ANTONIO CUBA. THE STORM IS MOVING TOWARD THE NORTHWEST AT 10 MPH. HIGHEST WINDS ARE ESTIMATED 70 MPH NEAR THE CENTER AND GALES EXTEND OUT 70 MILES FROM THE CENTER.

INDICATIONS ARE THAT CAMILLE WILL REACH HURRICANE FORCE THIS MORNING AND REACH EXTREME WESTERN CUBA AROUND NOON OR A LITTLE LATER. TIDES UP TO 6 FEET WILL OCCUR ON BOTH COASTS WHERE THE CENTER CROSSES EXTREME WESTERN CUBA. RAINS OF 5 TO 10 INCHES ARE LIKELY OVER THE ISLE OF PINES AND THAT PORTION OF CUBA WEST OF HAVANNA.

A SLIGHT TURN TO MORE NORTHERLY MOVEMENT IS EXPECTED AFTER CAMILLE PASSES CUBA AND ENTERS THE GULF OF MEXICO LATER TODAY. SMALL CRAFT AROUND THE FLORIDA KEYS SHOULD NOT VENTURE FAR FROM SHORE AND THOSE AROUND WESTERN CUBA SHOULD BE IN SAFE HARBOR.

REPEATING THE 6AM POSITION...20.8 NORTH...83.7 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT NOON EDT WITH A BULLETIN AT 9AM.

KRAFT

BULLETIN 9 AM EDT FRIDAY AUGUST 15, 1969

...CAMILLE A FULL FLEDGED HURRICANE...

ESSA RECONNAISSANCE PLANE FOUND CAMILLE HURRICANE FORCE WITH HIGHEST WINDS ESTIMATED 90 MPH. CONDITIONS ARE STILL FAVORABLE FOR SOME FURTHER INTENSIFICATION AND ALL INTERESTS IN CUBA WEST OF PINAR DEL RIO SHOULD PREPARE FOR HURRICANE FORCE WINDS AND HIGH TIDES OF 5 TO 10 FEET ON BOTH THE NORTH AND SOUTH COASTS. GALES WILL BEGIN WITHIN THE NEXT HOUR OR SO AND HURRICANE WINDS BY MID AFTERNOON. ELSEWHERE WEST OF HAVANA WINDS WILL BE OF GALE FORCE.

AT 9 AM EDT HURRICANE CAMILLE WAS NEAR LATITUDE 20.9 NORTH...LONGITUDE 83.9 WEST OR ABOUT 75 MILES FROM EXTREME SOUTHWESTERN CUBA. HURRICANE CAMILLE IS MOVING TOWARD CAPE SAN ANTONIO AT 8 MPH AND A SLIGHT TURN TO A MORE NORTHERLY TRACK IS FORECAST AFTER THE HURRICANE REACHES THE GULF.

HEAVY RAINS AND GALES ARE OCCURRING OVER MOST OF THE ISLE OF PINES AND HEAVY RAINS OF UP TO 10 INCHES ARE LIKELY FROM HAVANA WESTWARD.

SMALL CRAFT AROUND WESTERN CUBA SHOULD BE IN SAFE HARBOR AND THOSE IN THE FLORIDA KEYS SHOULD NOT VENTURE FAR FROM SHORE.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT NOON.

KRAFT

ADVISORY NO. 5 12 NOON EDT FRIDAY AUGUST 15, 1969

...CAMILLE TAKES A SLIGHTLY MORE NORTHERLY COURSE...

AT NOON EDT...1600Z... HURRICANE CAMILLE WAS CENTERED NEAR LATITUDE 21.2 NORTH...LONGITUDE 83.9 WEST OR ABOUT 400 MILES SOUTHWEST OF MIAMI AND PASSING ABOUT 60 MILES WEST OF THE ISLE OF PINES. CAMILLE IS MOVING TOWARD THE NORTH NORTHWEST AT 9 MPH. HIGHEST WINDS ARE NOW ESTIMATED TO BE NEAR 100 MPH OVER A SMALL AREA NEAR THE CENTER AND GALES EXTEND OUT 125 MILES TO THE NORTH AND 50 MILES TO THE SOUTH OVER WATER AREAS.

SURFACE OBSERVATIONS OVER CUBA AND SATELLITE PICTURES INDICATE THAT CAMILLE IS TURNING TO A MORE NORTHERLY COURSE AND ESSA RECONNAISSANCE FOUND MAXIMUM SURFACE WINDS NEAR 100 MPH DURING THE MORNING. CAMILLE IS EXPECTED TO MOVE ON A NORTHERLY COURSE FOR THE NEXT 12 HOURS WITH SOME INCREASE IN FORWARD SPEED.

CAMILLE SHOULD REACH WESTERN CUBA AROUND NOON OR A LITTLE LATER AND PRECAUTIONS SHOULD BE TAKEN IMMEDIATELY FOR RAPIDLY INCREASING WINDS REACHING HURRICANE FORCE BY EARLY AFTERNOON AND TIDES UP TO 8 FEET ON THE SOUTHWEST COAST. RAINS OF 5 TO 10 INCHES ARE LIKELY OVER THE ISLE OF PINES AND THAT PORTION OF CUBA WEST OF HAVANA.

THE TURN TO A MORE NORTHERLY COURSE AND INCREASE IN FORWARD SPEED WILL BRING CAMILLE INTO THE GULF OF MEXICO BY EVENING. SMALL CRAFT AROUND THE FLORIDA KEYS SHOULD NOT VENTURE FAR FROM SHORE AND THOSE AROUND WESTERN CUBA SHOULD BE IN SAFE HARBOR. THE HURRICANE WILL LOSE SOME INTENSITY AS IT CROSSES LAND BUT SHOULD REGAIN INTENSITY RATHER RAPIDLY AFTER IT MOVES INTO THE GULF OF MEXICO.

REPEATING THE NOON EDT POSITION...21.2 NORTH...83.9 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6 PM EDT WITH A BULLETIN AT 3 PM EDT.

HEBERT

BULLETIN 3 PM EDT FRIDAY AUGUST 15, 1969

...CAMILLE GROWS STRONGER AS IT EDGES CLOSER TO CUBA...

AN ESSA RECON PLANE TRACKING HURRICANE CAMILLE DURING THE DAY HAS REPORTED A STEADY INTENSIFICATION OF CAMILLE AND SOMEWHAT SLOWER MOVEMENT AS IT CONTINUES TO APPROACH THE SOUTHWEST COAST OF CUBA. THE EYE OF THE HURRICANE IS CLEARLY IN VIEW OF THE WEATHER RADAR IN HAVANA WHICH IS SUPPLYING REGULAR REPORTS TO THE NATIONAL HURRICANE CENTER.

AT 3 PM...1900Z...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 21.2 NORTH...LONGITUDE 84.2 WEST. THIS IS ABOUT 45 MILES SOUTH OF THE CUBAN COASTLINE AND 400 MILES SOUTHWEST OF MIAMI. THIS POSITION IS RELOCATED A SMALL DISTANCE WEST OF THE TRACK PROJECTED AT THE NOON ADVISORY WHICH WAS ISSUED BEFORE THE LATEST RECON INFORMATION BECAME AVAILABLE.

CAMILLE...WHILE STILL AN IMMATURE YOUNG HURRICANE WITH A VERY SMALL INTENSE CORE IS NEVERTHELESS THE MOST INTENSE HURRICANE SINCE BEULAH OF 1967. MAXIMUM WINDS ARE AT LEAST 115 MPH AND OVER THE WATER AREAS GALE FORCE WINDS EXTEND OUTWARD INTO THE EASTERN FLORIDA STRAIT AREA.

CAMILLE IS STILL MOVING NORTH NORTHWESTWARD BUT AT A REDUCED SPEED NO MORE THAN 6 OR 7 MPH AND WILL REACH THE CUBAN MAINLAND ABOUT 9 PM AND EMERGE INTO THE GULF OF MEXICO AROUND MIDNIGHT. INDICATIONS ARE THAT CAMILLE WILL PROCEED NORTHWARD ACROSS THE EASTERN GULF OF MEXICO WITH INCREASED SPEED BUT WILL NOT REACH ANY LAND AREAS BEFORE EARLY SUNDAY. NEVERTHELESS ALL INTERESTS IN THE KEYS AND WEST COAST OF FLORIDA SHOULD KEEP IN CLOSE TOUCH WITH FUTURE ADVISES IN THE EVENT THERE ARE CHANGES IN CONDITIONS ANTICIPATED AT THIS TIME.

REPEATING THE 3 PM EDT POSITION...21.2 NORTH...84.2 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6 PM EDT.

SIMPSON

ADVISORY NO. 6 6 PM EDT FRIDAY AUGUST 15, 1969

...CAMILLE LASHING EXTREME WESTERN CUBA...

GALE WARNINGS ARE IN EFFECT AT 6 PM EDT FOR MARQUESAS KEYS AND DRY TORTUGAS.

SMALL CRAFT IN THE FLORIDA KEYS SHOULD REMAIN IN SAFE HARBOR AND THOSE ALONG THE FLORIDA WEST COAST FROM TAMPA SOUTHWARD SHOULD NOT VENTURE FAR FROM SAFE HARBOR. SMALL CRAFT ON THE FLORIDA SOUTHEAST COAST SHOULD EXERCISE CAUTION.

AT 6 PM EDT HURRICANE CAMILLE WAS CENTERED NEAR LATITUDE 21.5 NORTH...LONGITUDE 84.4 WEST OR ABOUT 270 MILES SOUTHWEST OF KEY WEST. THIS POSITION IS BASED UPON AIR FORCE RECONNAISSANCE...LAND BASED RADAR...SHIP AND ISLAND REPORTS.

CAMILLE IS MOVING TOWARD THE NORTH NORTHWEST AT 7 MPH. HIGHEST WINDS ARE ESTIMATED 115 MPH NEAR THE CENTER WITH GALES EXTENDING OUT 125 TO 150 MILES TO THE NORTH OF THE CENTER AND 50 MILES TO THE SOUTH.

HURRICANE CONDITIONS ARE EXPECTED SHORTLY OVER THE EXTREME WESTERN TIP OF CUBA AS TIDES RANGE UP TO 8 FEET AND HEAVY PRECIPITATION EXPECTED TO CAUSE LOCAL FLOODING. ALTHOUGH GALE WINDS IN SQUALLS MAY OCCUR OVER PORTIONS OF EXTREME SOUTH FLORIDA TONIGHT... SUSTAINED GALES IN THE EXTREME WESTERN KEYS ARE NOT EXPECTED UNTIL EARLY SATURDAY.

IT IS EXPECTED THAT CAMILLE WILL ENTER THE GULF OF MEXICO EARLY SATURDAY MORNING AND PROCEED ON A NORTHERLY COURSE OVER THE EASTERN GULF AT A SLIGHTLY INCREASED FORWARD SPEED. WHILE A LITTLE DECREASE IN INTENSITY IS EXPECTED AS THE HURRICANE CROSSES CUBA...CAMILLE SHOULD REGAIN MAXIMUM WINDS OF 115 MPH IN THE GULF OF MEXICO.

ALL INTERESTS ALONG THE EASTERN GULF OF MEXICO SHOULD REMAIN IN CLOSE TOUCH WITH ALL FUTURE ADVISORIES AND BULLETINS.

REPEATING THE 6 PM EDT POSITION...LATITUDE 21.5 NORTH...LONGITUDE 84.4 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT MIDNIGHT EDT WITH AN INTERMEDIATE BULLETIN AT 9 PM.

HOPE

BULLETIN 9 PM EDT FRIDAY AUGUST 15, 1969

...EYE OF CAMILLE OVER EXTREME WESTERN CUBA...

CAMILLE IS NOW UNDER SURVEILLANCE OF THE KEY WEST AND HAVANA RADARS. AT 9 PM BOTH LOCATE THE CENTER OF THE STORM OVER EXTREME WESTERN CUBA MIDWAY BETWEEN CAPE SAN ANTONIO AND GUANE NEAR LATITUDE 22.0 NORTH...LONGITUDE 84.5 WEST. THIS POSITION IS 250 MILES SOUTH SOUTHWEST OF KEY WEST FLORIDA.

THERE HAVE BEEN NO REPORTS OF PEAK WINDS OR TIDES FROM LOCATIONS IN THE IMMEDIATE PATH OF THE EYE HOWEVER STATIONS ON THE PERIPHERY OF THE CALM CENTRAL REGION HAVE RECORDED WINDS IN EXCESS OF 50 MPH.

AN AIR FORCE RECONNAISSANCE PLANE THIS AFTERNOON FOUND A CENTRAL PRESSURE OF 966 MB OR 28.53 INCHES.

SMALL CRAFT IN THE FLORIDA KEYS SHOULD REMAIN IN SAFE HARBOR AND THOSE ALONG THE FLORIDA WEST COAST FROM TAMPA SOUTHWARD SHOULD NOT VENTURE FAR FROM SAFE HARBOR. SMALL CRAFT ON THE FLORIDA SOUTHEAST COAST SHOULD EXERCISE CAUTION.

CAMILLE IS EXPECTED TO CONTINUE MOVING TOWARDS THE NORTH NORTHWEST OR NORTH AT A SPEED SLIGHTLY LESS THAN 10 MPH. ALL INTERESTS ALONG THE EASTERN GULF OF MEXICO SHOULD REMAIN IN CLOSE TOUCH WITH FUTURE ADVISORIES AND BULLETINS.

REPEATING THE 9 PM EDT POSITION...22.0 NORTH...84.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT MIDNIGHT EDT.

FRANK

BULLETIN 11 PM EDT FRIDAY AUGUST 15, 1969

...NO CHANGE IN CAMILLE...

AT 11 PM EDT...0300Z...THE CENTER OF HURRICANE CAMILLE WAS JUST NORTH OF THE NORTH COAST OF EXTREME WESTERN CUBA. THE COORDINATES OF THE CENTER WERE 22.5 NORTH...84.6 WEST.

HIGHEST WINDS ARE ESTIMATED 100 MPH NEAR THE CENTER. CAMILLE IS HEADED FOR THE OPEN GULF OF MEXICO AND THERE WILL BE NO CHANGE IN WARNINGS IN THE NEXT ADVISORY TO BE ISSUED BY THE NATIONAL HURRICANE CENTER AT MIDNIGHT.

WINDS OF 92 MPH AND RAINFALLS AS MUCH AS 10 INCHES WERE REPORTED IN THE VICINITY OF GUANE AND THE ISLE OF PINES THIS EVENING.

SUGG

ADVISORY NO. 7 12 MIDNIGHT EDT SATURDAY AUGUST 16, 1969

...CAMILLE DELIVERS MIGHTY BLOW TO CUBA...HEADED FOR THE OPEN GULF...

GALE WARNINGS ARE IN EFFECT FOR THE MARQUESAS KEYS AND DRY TORTUGAS.

SMALL CRAFT IN THE FLORIDA KEYS SHOULD REMAIN IN SAFE HARBOR AND THOSE ALONG THE FLORIDA WEST COAST SHOULD NOT VENTURE FAR FROM SAFE HARBOR. SMALL CRAFT ALONG THE FLORIDA EAST COAST SHOULD EXERCISE CAUTION.

CAMILLE...A DANGEROUS HURRICANE...ENTERING THE EAST PORTION OF THE GULF OF MEXICO...POSES A GREAT THREAT TO THE UNITED STATES MAINLAND. ALL INTERESTS ALONG THE EASTERN GULF OF MEXICO SHOULD KEEP IN CLOSE TOUCH WITH FUTURE ADVISORIES... A HURRICANE WATCH WILL PROBABLY BE ISSUED FOR A PORTION OF THE COASTAL AREA OF THE NORTHEAST GULF BY OR PRIOR TO NOON SATURDAY.

AT MIDNIGHT...0400Z...THE CENTER OF HURRICANE CAMILLE WAS ESTIMATED TO BE NEAR LATITUDE 22.6 NORTH...LONGITUDE 84.6 WEST. THIS POSITION IS JUST NORTH OF THE WESTERN TIP OF CUBA AND 225 MILES SOUTHWEST OF KEY WEST FLORIDA AND IS BASED UPON LAND BASED RADAR AND ISLAND REPORTS.

CAMILLE IS MOVING ON A NORTH NORTHWESTERLY COURSE AT 10 MPH...A LITTLE FASTER THAN EARLIER TODAY. ANY CHANGE IN MOVEMENT DURING THE NEXT 24 HOURS WILL BE A TREND TO A MORE NORTHERLY COURSE AND POSSIBLY AT A SLIGHTLY INCREASED FORWARD SPEED.

HIGHEST WINDS IN THE HURRICANE ARE 100 MPH BUT THERE IS NO REASON TO BELIEVE THAT CAMILLE WILL NOT REGAIN HER 115 MPH MAXIMUM WIND OVER THE GULF OF MEXICO.

REPEATING THE MIDNIGHT POSITION 22.6 NORTH...84.6 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 6 AM EDT WITH AN INTERMEDIATE BULLETIN AT 3 AM EDT.

SUGG

BULLETIN 3 AM EDT SATURDAY AUGUST 16, 1969

...CAMILLE BACK AT SEA...

AT 3AM EDT CAMILLE WAS NEAR LATITUDE 23.2 NORTH...LONGITUDE 85.0 WEST OR ABOUT 225 MILES WEST SOUTHWEST OF KEY WEST AND 70 MILES FROM THE EXTREME COAST OF CUBA. CAMILLE IS MOVING TOWARD THE NORTH NORTHWEST AT 10 MPH.

CONDITIONS IN WESTERN CUBA WILL GRADUALLY IMPROVE TODAY BUT HEAVY RAINS CAN BE EXPECTED TO CONTINUE...INCREASING THE THREAT OF LOCAL FLOODING.

HIGHEST WINDS ARE ESTIMATED 100 MPH NEAR THE CENTER WITH GALES EXTENDING OUT 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO GROW SLIGHTLY IN SIZE AND INTENSITY TODAY.

REPEATING THE 3AM POSITION...23.2 NORTH...85.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT 5AM EDT.

KRAFT

ADVISORY NO. 8 6 AM EDT SATURDAY AUGUST 16, 1969

...CAMILLE POSES THREAT TO NORTHWEST FLORIDA...

GALE WARNINGS ARE IN EFFECT AT DRY TORTUGAS.

SMALL CRAFT ALONG THE NORTHWEST FLORIDA COAST AND AS FAR WEST AS MOBILE SHOULD SEEK SAFE HARBOR TONIGHT. A HURRICANE WATCH WILL UNDOUBTEDLY BE NEEDED OVER MOST OF THIS AREA LATER THIS MORNING AND WARNINGS FOR A PORTION OF THE AREA THIS AFTERNOON. SMALL CRAFT ALONG THE SOUTHWEST FLORIDA COAST AND KEYS SHOULD REMAIN IN PORT TODAY.

AT 6AM EDT ...1000Z ...HURRICANE CAMILLE WAS NEAR LATITUDE 23.7 NORTH...LONGITUDE 85.3 WEST OR ABOUT 450 MILES SOUTH OF THE FLORIDA PANHANDLE. CAMILLE IS MOVING TOWARD THE NORTH NORTHWEST AT 10 MPH AND IS EXPECTED TO CONTINUE THIS MOVEMENT TODAY WITH A GRADUAL TURN TO NORTH TONIGHT.

HIGHEST WINDS ARE ESTIMATED 100 MPH NEAR THE CENTER WITH GALES EXTENDING OUT 150 MILES FROM THE CENTER. CONDITIONS ARE FAVORABLE FOR CAMILLE TO INCREASE SLOWLY IN SIZE AND INTENSITY TODAY.

REPEATING THE 6AM POSITION...23.7 NORTH...85.3 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT NOON EDT WITH AN IMPORTANT BULLETIN LIKELY AT 9AM.

KRAFT

SPECIAL ADVISORY NO. 9 9 AM EDT SATURDAY AUGUST 16, 1969

.. HURRICANE WATCH ORDERED FOR GULF COAST FROM NORTHWEST FLORIDA TO MISSISSIPPI...

A HURRICANE WATCH IS IN EFFECT FROM BILOXI MISSISSIPPI TO ST. MARKS FLORIDA AT 8 AM CDT. SPECIFIC HURRICANE WARNINGS WILL BE ISSUED FOR PORTIONS OF THIS COASTLINE AT NOON TODAY FOLLOWING RECEIPT OF FURTHER RECON INFORMATION FROM THE CENTER OF HURRICANE CAMILLE.

GALE WARNINGS WILL REMAIN IN EFFECT AT DRY TORTUGAS UNTIL WINDS AND SEAS SUBSIDE LATER TODAY.

DURING THE NIGHT HURRICANE CAMILLE CROSSED CUBA AND PROCEEDED SLOWLY INTO THE GULF OF MEXICO AND AT 9 AM EDT...8AM CDT...1300Z... WAS LOCATED NEAR LATITUDE 24.1 NORTH...LONGITUDE 85.8 WEST. THIS IS ABOUT 420 MILES SOUTH OF PANAMA CITY FLORIDA. DURING THE NIGHT RADAR HAS INDICATED THE CENTER IS CONTINUING ON A NORTH NORTHWEST COURSE AT ABOUT 10 MPH. STEERING CONDITIONS NORTH OF THIS HURRICANE ARE UNDERGOING SOME CHANGES BUT THIS COURSE IS EXPECTED TO BE MAINTAINED FOR AT LEAST ANOTHER 12 HOURS.

WHILE THERE HAS BEEN NO INFORMATION AVAILABLE FROM THE STORM CENTER SINCE IT APPROACHED CUBA STRONGEST WINDS SHOULD REMAIN NOT LESS THAN 100 MPH WITH FURTHER INTENSIFICATION EXPECTED TODAY.

TIDES WILL INCREASE SLOWLY DURING THE DAY ALONG THE AREA OF THE HURRICANE WATCH AND SQUALLS WITH GALE FORCE WINDS WILL BEGIN ALONG SOME OF THESE AREAS SATURDAY NIGHT.

CAMILLE IS POTENTIALLY A VERY DANGEROUS HURRICANE. ALL INTERESTS IN THE WATCH AREA AND ADJACENT COASTLINES SHOULD REMAIN IN CLOSE TOUCH WITH LATER ADVICES TODAY AND BE PREPARED FOR FAST PROTECTIVE ACTION WHEN WARNINGS ARE ISSUED.

SMALL CRAFT FROM CEDAR KEY FLORIDA TO GRAND ISLE LOUISIANA SHOULD NOT VENTURE FAR FROM SAFE HARBOR AND IN THE AREA OF HURRICANE WATCH SHOULD REMAIN IN PORT.

REPEATING THE 9 AM EDT POSITION...24.1 NORTH...85.8 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT NOON EDT...11 AM CDT.

SIMPSON

NEW ORLEANS

ADVISORY NO. 10 11 AM CDT SATURDAY AUGUST 16, 1969

..HURRICANE CAMILLE...SMALL BUT DANGEROUS...THREATENS THE NORTHWEST FLORIDA COAST...

THE WEATHER BUREAU HAS ISSUED HURRICANE WARNINGS ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY EFFECTIVE AT 11 AM CDT. PREPARATIONS FOR HURRICANE FORCE WINDS AND 5 TO 10 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE STARTED IMMEDIATELY AND COMPLETED TONIGHT.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR FURTHER RELEASES.

GALE WARNINGS WILL REMAIN IN EFFECT AT DRY TORTUGAS UNTIL WINDS AND SEAS SUBSIDE LATER TODAY.

At 1100 AM CDT...1600Z...HURRICANE CAMILLE WAS CENTERED NEAR LATITUDE 24.5 NORTH...LONGITUDE 86.0 WEST...OR ABOUT 380 MILES SOUTH OF PANAMA CITY FLORIDA AND IT WAS MOVING NORTH NORTHWESTWARD ABOUT 10 MPH.

CAMILLE IS EXPECTED TO CONTINUE THIS MOVEMENT TODAY WITH A GRADUAL TURN TO THE NORTH TONIGHT. A SLIGHT INCREASE IN SPEED IS LIKELY TONIGHT AND SUNDAY.

HIGHEST WINDS ARE ESTIMATED 115 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUT ABOUT 40 MILES FROM THE CENTER AND GALES EXTEND OUT ABOUT 150 MILES FROM THE CENTER. CONDITIONS ARE FAVORABLE FOR SOME FURTHER INCREASE IN INTENSITY TODAY.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COASTS SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 11 AM POSITION...24.5 NORTH...86.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM CDT AND BULLETINS AT 1 AND 3 PM CDT.

CONNOR

BULLETIN 1 PM CDT SATURDAY AUGUST 16, 1969

...DANGEROUS HURRICANE CAMILLE CONTINUES TO MOVE TOWARDS THE NORTHWEST FLORIDA COAST...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS FOR HURRICANE FORCE WINDS AND 5 TO 10 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE COMPLETE TONIGHT.

ALL INTEREST ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

NO INFORMATION HAS BEEN RECEIVED NEAR THE CENTER OF CAMILLE SINCE EARLY THIS MORNING. ANOTHER RECON PLANE IS APPROACHING THE STORM AND MORE DETAILS WILL BE AVAILABLE LATER THIS AFTERNOON.

AT 1 PM CDT...HURRICANE CAMILLE WAS CENTERED NEAR LATITUDE 24.7 NORTH...LONGITUDE 86.1 WEST...OR ABOUT 360 MILES SOUTH OF PANAMA CITY FLORIDA AND IT WAS MOVING NORTH NORTHWESTWARD ABOUT 10 MPH.

CAMILLE IS EXPECTED TO TURN TO A MORE NORTHERLY COURSE TONIGHT AND A SLIGHT INCREASE IN SPEED IS LIKELY.

HIGHEST WINDS ARE ESTIMATED 115 MPH NEAR THE CENTER. CONDITIONS APPEAR FAVORABLE FOR SOME FURTHER INCREASE IN INTENSITY.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COASTS SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 1 PM CDT POSITIONS...24.8 NORTH...86.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM CDT AND A BULLETIN AT 3 PM CDT.

CONNER

BULLETIN 3 PM CDT SATURDAY AUGUST 16, 1969

...DANGEROUS HURRICANE CAMILLE STALLS TEMPORARILY...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST HURRICANE FORCE WINDS AND 5 TO 10 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE COMPLETED TONIGHT.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 3 PM CDT...RECONNAISSANCE AIRCRAFT LOCATED THE CENTER OF HURRICANE CAMILLE NEAR LATITUDE 24.7 NORTH...LONGITUDE 86.5 WEST...OR ABOUT 360 MILES SOUTH OF PANAMA CITY FLORIDA. CAMILLE MOVED LITTLE DURING THE LAST FEW HOURS.

CAMILLE IS EXPECTED TO RESUME ITS NORTH NORTHWESTWARD MOVEMENT AT ABOUT 10 MPH TONIGHT. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED DURING THE NIGHT.

HIGHEST WINDS ARE ESTIMATED 115 MPH NEAR THE CENTER. CONDITIONS APPEAR FAVORABLE FOR SOME FURTHER INCREASE IN INTENSITY.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COASTS SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 3 PM POSITION...24.7 NORTH...86.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM CDT.

ADVISORY NO. 11 5 PM CDT SATURDAY AUGUST 16, 1969

...SMALL HURRICANE CAMILLE BECOMES VERY INTENSE...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST DANGEROUS WINDS AND 5 TO 12 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE COMPLETED TONIGHT. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 5 PM CDT...2200Z...RECONNAISSANCE AIRCRAFT LOCATED THE CENTER OF HURRICANE CAMILLE NEAR LATITUDE 24.8 NORTH...LONGITUDE 86.7 WEST...OR ABOUT 380 MILES SOUTH OF FORT WALTON FLORIDA. CAMILLE MOVED LITTLE DURING THE LAST FEW HOURS AND INTENSIFIED RAPIDLY.

CAMILLE IS EXPECTED TO RESUME ITS NORTH NORTHWESTWARD MOVEMENT AT ABOUT 10 MPH TONIGHT. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED DURING THE NIGHT.

HIGHEST WINDS ARE ESTIMATED 150 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUT ABOUT 50 MILES AND GALES EXTEND OUT ABOUT 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NIGHT.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COASTS SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 5 PM POSITION...24.8 NORTH...86.7 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM AND BULLETINS AT 7 AND 9 PM CDT.

CONNER

BULLETIN 7 PM CDT SATURDAY AUGUST 16, 1969

...HURRICANE CAMILLE...A VERY INTENSE AND DANGEROUS STORM...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST DANGEROUS WINDS AND 5 TO 12 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE COMPLETED TONIGHT. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 7 PM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 25.0 NORTH...LONGITUDE 86.9 WEST...OR ABOUT 365 MILES SOUTH OF FORT WALTON FLORIDA. CAMILLE STALLED TEMPORARILY THIS AFTERNOON AS IT INTENSIFIED...BUT IS EXPECTED TO RESUME A NORTH NORTHWESTWARD MOVEMENT AT ABOUT 10 MPH TONIGHT. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED LATE TONIGHT.

HIGHEST WINDS ARE ESTIMATED 150 MPH NEAR THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NIGHT.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COASTS SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 7 PM POSITION...25.0 NORTH...86.9 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM WITH A BULLETIN AT 9 PM CDT.

SLOAN

BULLETIN 9 PM CDT SATURDAY AUGUST 16, 1969

...INTENSE HURRICANE CAMILLE RESUMES MOVEMENT...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST DANGEROUS WINDS AND 5 TO 12 FOOT TIDES IN THE AREA FROM FORT WALTON TO ST. MARKS SHOULD BE COMPLETED TONIGHT. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 9 PM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 25.4 NORTH...LONGITUDE 87.3 WEST...OR ABOUT 350 MILES SOUTH OF PENSACOLA FLORIDA. CAMILLE WAS MOVING NORTH NORTHWESTWARD ABOUT 12 MPH. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED TONIGHT.

HIGHEST WINDS ARE ESTIMATED 150 MPH NEAR THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NIGHT.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COAST SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 9 PM POSITION...25.4 NORTH...87.3 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM CDT.

SLOAN

ADVISORY NO. 12 11 PM CDT SATURDAY AUGUST 16, 1969

...CAMILLE...EXTREMELY DANGEROUS...THREATENS THE NORTHWEST FLORIDA COAST...

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST THIS DANGEROUS HURRICANE SHOULD BE COMPLETED SUNDAY MORNING. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

WINDS WILL INCREASE AND TIDES WILL START TO RISE ALONG THE NORTHEASTERN GULF COAST SUNDAY. GALES SHOULD BEGIN IN THE WARNING AREA SUNDAY AND REACH HURRICANE FORCE IN THE FORT WALTON ST. MARKS AREA SUNDAY AFTERNOON OR SUNDAY NIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST. TIDES ARE INDICATED 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 11 PM CDT...0400Z...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 25.8 NORTH...LONGITUDE 87.4 WEST...OR ABOUT 325 MILES SOUTH OF PENSACOLA FLORIDA. CAMILLE WAS MOVING NORTH NORTHWESTWARD ABOUT 12 MPH. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED WITH LITTLE CHANGE IN FORWARD SPEED.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 50 MILES AND GALES EXTEND OUTWARD 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COAST SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 11 PM POSITION...25.8 NORTH...87.4 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM AND BULLETINS AT 1 AND 3 AM CDT.

SLOAN

BULLETIN 1 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CONTINUED THREAT TO THE NORTHWEST FLORIDA COAST.

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST THIS DANGEROUS HURRICANE SHOULD BE COMPLETED SUNDAY MORNING. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

WINDS WILL INCREASE AND TIDES WILL START TO RISE ALONG THE NORTHEASTERN GULF COAST SUNDAY. GALES SHOULD BEGIN IN THE WARNING AREA SUNDAY AND REACH HURRICANE FORCE IN THE FORT WALTON ST MARKS AREA SUNDAY AFTERNOON OR SUNDAY NIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST. TIDES ARE INDICATED 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 1 AM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 26.2 NORTH...LONGITUDE 87.5 WEST...OR ABOUT 300 MILES SOUTH OF PENSACOLA FLORIDA. CAMILLE WAS MOVING NORTH NORTHWESTWARD ABOUT 12 MPH. A CHANGE TO A MORE NORTHERLY COURSE IS INDICATED WITH LITTLE CHANGE IN FORWARD SPEED.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COAST SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 1 AM POSITION...26.2 NORTH...87.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM AND A BULLETIN AT 3 AM CDT.

HILL

BULLETIN 3 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CONTINUES ITS THREAT TO THE NORTHWEST FLORIDA COAST.

HURRICANE WARNINGS ARE IN EFFECT ON THE NORTHWEST FLORIDA COAST FROM FORT WALTON TO ST. MARKS AND GALE WARNINGS ELSEWHERE FROM PENSACOLA TO CEDAR KEY. PREPARATIONS AGAINST THIS DANGEROUS HURRICANE SHOULD BE COMPLETED SUNDAY MORNING. A HURRICANE WATCH IS IN EFFECT WEST OF FORT WALTON TO BILOXI.

WINDS WILL INCREASE AND TIDES WILL START TO RISE ALONG THE NORTHEASTERN GULF COAST SUNDAY. GALES SHOULD BEGIN IN THE WARNING AREA SUNDAY AND REACH HURRICANE FORCE IN THE FORT WALTON ST. MARKS AREA SUNDAY AFTERNOON OR SUNDAY NIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST. TIDES ARE INDICATED 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 3 AM CDT...HURRICANE CAMILLE WAS LOCATED BY NAVY RECONNAISSANCE AIRCRAFT NEAR LATITUDE 26.7 NORTH...LONGITUDE 87.6 WEST...OR ABOUT 260 MILES SOUTH OF PENSACOLA FLORIDA. CAMILLE WAS MOVING ON A COURSE JUST A LITTLE WEST OF NORTH AT ABOUT 12 MPH. A SLIGHT CHANGE TO A MORE NORTHERLY COURSE IS INDICATED WITH LITTLE CHANGE IN FORWARD SPEED.

THE RECONNAISSANCE PLANE FOUND CAMILLE STILL WELL ORGANIZED WITH A SMALL COMPACT EYE. HIGHEST WINDS AND ESTIMATED 160 MPH NEAR THE CENTER. LITTLE CHANGE IN INTENSITY IS EXPECTED TODAY WITH CAMILLE REMAINING AN EXTREMELY DANGEROUS HURRICANE.

THE OUTER FRINGES OF CAMILLE ARE COMING INTO RANGE OF THE NEW ORLEANS AND APALACHICOLA RADARS.

SMALL CRAFT FROM PENSACOLA TO CEDAR KEY SHOULD SEEK HARBOR...AND SMALL CRAFT ON THE ALABAMA...MISSISSIPPI AND SOUTHEAST LOUISIANA COAST SHOULD NOT VENTURE FAR FROM SHORE.

REPEATING THE 3 AM POSITION...26.7 NORTH...87.6 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM AND BULLETINS AT 7 AND 9 AM CDT.

HILL

ADVISORY NO. 13 5 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...SHIFTS A LITTLE WESTWARD...THREATENS MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COASTS...

HURRICANE WARNINGS HAVE BEEN EXTENDED WESTWARD TO BILOXI INCLUDING THE ALABAMA COAST AND THE PENSACOLA AREA OF NORTHWEST FLORIDA... HURRICANE WATCH AND GALE WARNINGS HAVE BEEN EXTENDED WESTWARD TO NEW ORLEANS AND GRAND ISLE LOUISIANA. HURRICANE WARNINGS ARE NOW IN EFFECT FROM BILOXI MISSISSIPPI TO ST. MARKS FLORIDA AND GALE WARNINGS ELSEWHERE FROM NEW ORLEANS AND GRAND ISLE TO CEDAR KEYS FLORIDA. HURRICANE WATCH IS IN EFFECT FROM NEW ORLEANS AND GRAND ISLE TO BILOXI. PREPARATIONS AGAINST THIS DANGEROUS HURRICANE SHOULD BE COMPLETED AS EARLY AS POSSIBLE TODAY IN THE AREA OF HURRICANE WARNINGS AND PERSONS IN THE AREA OF THE HURRICANE WATCH SHOULD BE PREPARED TO TAKE QUICK ACTION IF NECESSARY.

WINDS WILL INCREASE AND TIDES WILL START TO RISE ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD TODAY. GALES WILL BEGIN IN THE WARNING AREA TODAY AND REACH HURRICANE FORCE FROM BILOXI EASTWARD ACROSS COASTAL ALABAMA AND EXTREME NORTHWEST FLORIDA BY LATE THIS AFTERNOON OR EARLY TONIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST AND TIDES OF 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA. EVACUATION OF THE LOW LYING AREA THAT WOULD BE AFFECTED BY THESE TIDES SHOULD BE DONE AS EARLY AS POSSIBLE TODAY BEFORE ESCAPE ROUTES ARE CLOSED. THE CENTER IS EXPECTED TO MOVE INLAND NEAR MOBILE TONIGHT.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 5 AM CDT...1000Z...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 26.9 NORTH...LONGITUDE 87.9 WEST...OR ABOUT 250 MILES SOUTH OF MOBILE ALABAMA. CAMILLE WAS MOVING ON A COURSE A LITTLE WEST OF NORTH AT ABOUT 12 MPH. A CHANGE TO A SLIGHTLY MORE NORTHERLY COURSE IS INDICATED WITH LITTLE CHANGE IN FORWARD SPEED.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 50 MILES AND GALES EXTEND OUTWARD 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT ON THE LOUISIANA...MISSISSIPPI...ALABAMA AND EXTREME NORTHWEST FLORIDA COAST SHOULD REMAIN IN PORT.

REPEATING THE 5 AM POSITION...26.9 NORTH...87.9 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 AM AND A BULLETIN AT 7 AND 9 AM CDT.

CONNOR

BULLETIN 7 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...MOVING TOWARD THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COASTS...

HURRICANE WATCH WAS EXTENDED WESTWARD TO NEW ORLEANS AND GRAND ISLE LOUISIANA AT 5 AM CDT. THE MOVEMENT OF HURRICANE CAMILLE DURING THE PAST FEW HOURS HAS BEEN GENERALLY TOWARD THE MOUTH OF THE MISSISSIPPI RIVER AND UNLESS THE ANTICIPATED TURN TO A MORE NORTHERLY COURSE OCCURS WITHIN THE NEXT FEW HOURS IT WILL BE NECESSARY TO EXTEND HURRICANE WARNINGS INTO THE AREA OF HURRICANE WATCH.

HURRICANE WARNINGS ARE IN EFFECT FROM BILOXI MISSISSIPPI TO ST. MARKS FLORIDA AND GALE WARNINGS ELSEWHERE FROM NEW ORLEANS AND GRAND ISLE TO CEDAR KEYS FLORIDA. PREPARATIONS AGAINST THIS DANGEROUS HURRICANE SHOULD BE COMPLETED AS EARLY AS POSSIBLE TODAY IN THE AREA OF HURRICANE WARNINGS AND PERSONS IN THE AREA OF HURRICANE WATCH SHOULD BE PREPARED TO TAKE QUICK ACTION IF IT BECOMES NECESSARY TO EXTEND HURRICANE WARNING TO THE NEW ORLEANS GRAND ISLE AREA.

WINDS ARE INCREASING AND TIDES WILL START TO RISE ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD TODAY. GALES WILL BEGIN IN THE WARNING AREA TODAY AND REACH HURRICANE FORCE FROM BILOXI EASTWARD ACROSS COASTAL ALABAMA AND EXTREME NORTHWEST FLORIDA BY LATE THIS AFTERNOON OR EARLY TONIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST AND TIDES OF 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA. EVACUATION OF THE LOW LYING AREA THAT WILL BE AFFECTED BY THESE TIDES SHOULD BE DONE AS EARLY AS POSSIBLE TODAY BEFORE ESCAPE ROUTES ARE CLOSED. THE CENTER IS EXPECTED TO MOVE INLAND NEAR MOBILE TONIGHT.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES.

AT 7 AM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 27.2 NORTH...LONGITUDE 88.1 WEST...OR ABOUT 230 MILES SOUTH OF MOBILE ALABAMA. CAMILLE WAS MOVING ON A COURSE A LITTLE WEST OF NORTH AT ABOUT 12 MPH. A CHANGE TO A SLIGHTLY MORE NORTHERLY COURSE IS INDICATED WITH LITTLE CHANGE IN FORWARD SPEED.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 50 MILES AND GALES EXTEND OUTWARD 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT ON THE LOUISIANA...MISSISSIPPI...ALABAMA...FLORIDA COAST NORTH OF CEDAR KEYS SHOULD REMAIN IN PORT.

THE NORTHERN PORTIONS OF CAMILLE ARE NOW UNDER THE SURVEILLANCE OF RADARS AT NEW ORLEANS...PENSACOLA...AND APALACHICOLA.

REPEATING THE 7 AM POSITION...27.2 NORTH...88.1 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 AM AND A BULLETIN AT 9 AM CDT.

HILL

ADVISORY NO. 14 9 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CONTINUES TO MOVE TOWARD THE MOUTH OF THE MISSISSIPPI RIVER...WARNINGS EXTENDED TO NEW ORLEANS AND GRAND ISLE....

HURRICANE WARNINGS HAVE BEEN EXTENDED WESTWARD TO INCLUDE ALL OF THE MISSISSIPPI COAST AND SOUTHEASTERN LOUISIANA AS FAR WEST AS NEW ORLEANS AND GRAND ISLE.

GALE WARNINGS HAVE BEEN EXTENDED WESTWARD TO MORGAN CITY LOUISIANA. HURRICANE WARNINGS ARE NOW IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND...NORTHWEST FLORIDA COAST TO ST. MARKS. GALE WARNINGS ARE NOW IN EFFECT ELSEWHERE FROM MORGAN CITY TO CEDAR KEYS FLORIDA. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED WITHIN THE NEXT FEW HOURS.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. GALES HAVE BEGUN A SHORT DISTANCE OFF SHORE AND WILL BE SPREADING INLAND OVER THE WARNING AREA TODAY AND WILL REACH HURRICANE FORCE FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...ALABAMA...AND EXTREME NORTHWEST FLORIDA BY LATE THIS AFTERNOON OR EARLY TONIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST AND TIDES OF 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA. EVACUATION OF THE LOW LYING AREA THAT WILL BE AFFECTED BY THESE TIDES SHOULD BE DONE AS EARLY AS POSSIBLE TODAY BEFORE ESCAPE ROUTES ARE CLOSED. PRESENT INDICATIONS ARE THAT THE CENTER OF CAMILLE WILL PASS CLOSE TO THE MOUTH OF THE MISSISSIPPI RIVER LATE THIS AFTERNOON AND MOVE INLAND ON THE MISSISSIPPI COAST TONIGHT.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND TAKE ALL NECESSARY HURRICANE PRECAUTIONS IMMEDIATELY.

AT 9 AM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 27.4 NORTH...LONGITUDE 88.4 WEST...OR ABOUT 200 MILES SOUTHEAST OF NEW ORLEANS. CAMILLE WAS MOVING ON A NORTH NORTHWEST COURSE AT ABOUT 12 MPH. A CHANGE TO A SLIGHTLY MORE NORTHERLY COURSE IS LIKELY AS THE CENTER APPROACHES THE COAST.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 50 MILES AND GALES EXTEND OUTWARD 150 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT ON THE LOUISIANA...MISSISSIPPI...ALABAMA...FLORIDA COAST NORTH OF CEDAR KEYS SHOULD REMAIN IN PORT.

THE THREAT TO THE FLORIDA COAST IS DECREASING AND WARNINGS WILL PROBABLY BE DISCONTINUED FOR PART OF THAT AREA LATER TODAY.

CAMILLE IS NOW UNDER THE SURVEILLANCE OF RADARS AT NEW ORLEANS...PENSACOLA AND APALACHICOLA.

REPEATING THE 9 AM POSITION...27.4 NORTH...88.4 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 AM AND BULLETINS AT 1 AND 3 PM CDT.

HILL

ADVISORY NO. 15 11 AM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CONTINUES TO MOVE TOWARD THE MOUTH OF THE MISSISSIPPI RIVER...THREATENS SOUTHEAST LOUISIANA COAST EASTWARD TO EXTREME NORTHWEST FLORIDA.

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND...NORTH WEST FLORIDA COAST TO ST. MARKS. GALE WARNINGS ARE IN EFFECT ELSEWHERE FROM MORGAN CITY TO CEDAR KEYS FLORIDA. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED WITHIN THE NEXT FEW HOURS.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. GALES HAVE BEGUN A SHORT DISTANCE OFFSHORE AND WILL BE SPREADING INLAND OVER THE WARNING AREA THIS AFTERNOON AND WINDS WILL REACH HURRICANE FORCE OVER MUCH OF THE AREA FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...ALABAMA...AND INTO EXTREME NORTHWEST FLORIDA BY LATE THIS AFTERNOON OR EARLY TONIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST AND TIDES OF 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA. EVACUATION OF THE LOW LYING AREA THAT WILL BE AFFECTED BY THESE TIDES SHOULD BE DONE AS EARLY AS POSSIBLE TODAY BEFORE ESCAPE ROUTES ARE CLOSED. PRESENT INDICATIONS ARE THAT THE CENTER OF CAMILLE WILL PASS CLOSE TO THE MOUTH OF THE MISSISSIPPI RIVER LATE THIS AFTERNOON AND MOVE INLAND ON THE MISSISSIPPI COAST TONIGHT.

SEVERAL TORNADOES ARE LIKELY OVER EXTREME SOUTHEAST LOUISIANA EASTWARD TO FORT WALTON FLORIDA AND UP TO 100 MILES INLAND THIS AFTERNOON AND TONIGHT.

HEAVY RAINS WITH LOCAL AMOUNTS UP TO 10 INCHES WILL SPREAD INTO SOUTHEASTERN MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE THIS AFTERNOON AND TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY LOCAL WEATHER BUREAU OFFICES.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND TAKE ALL NECESSARY HURRICANE PRECAUTIONS IMMEDIATELY.

AT 11 AM CDT...1600Z...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 27.6 NORTH...LONGITUDE 88.5 WEST OR ABOUT 185 MILES SOUTHEAST OF NEW ORLEANS. CAMILLE WAS MOVING ON A NORTH NORTHWEST COURSE AT ABOUT 12 MPH. A CHANGE TO A SLIGHTLY MORE NORTHERLY COURSE IS LIKELY AS THE CENTER APPROACHES THE COAST.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER. CAMILLE IS EXPECTED TO CHANGE LITTLE IN INTENSITY DURING THE NEXT 12 HOURS.

SMALL CRAFT ON THE LOUISIANA...MISSISSIPPI...ALABAMA...FLORIDA COAST NORTH OF CEDAR KEYS SHOULD REMAIN IN SAFE HARBOR.

THE THREAT TO THE FLORIDA COAST IS DECREASING AND WARNINGS WILL PROBABLY BE DISCONTINUED FOR PART OF THAT AREA LATER TODAY.

REPEATING THE 11 AM POSITION...27.6 NORTH...88.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM AND BULLETINS AT 1 AND 3 PM CDT.

CONNER

BULLETIN 1 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CONTINUES TO MOVE TOWARD THE MOUTH OF THE MISSISSIPPI RIVER...THREATENS SOUTHEAST LOUISIANA COAST EASTWARD TO EXTREME NORTHWEST FLORIDA...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND...NORTH WEST FLORIDA COAST TO ST. MARKS. GALE WARNINGS ARE IN EFFECT ELSEWHERE FROM MORGAN CITY TO CEDAR KEYS FLORIDA. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED WITHIN THE NEXT FEW HOURS.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. GALES HAVE BEGUN AT THE MOUTH OF THE MISSISSIPPI RIVER AND WILL BE SPREADING INLAND OVER THE WARNING AREA THIS AFTERNOON WITH WINDS REACHING HURRICANE FORCE OVER MUCH OF THE AREA FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...ALABAMA...AND INTO EXTREME NORTHWEST FLORIDA LATE THIS AFTERNOON OR EARLY TONIGHT. TIDES UP TO 15 FEET ARE EXPECTED IN THE AREA WHERE THE CENTER CROSSES THE COAST AND TIDES OF 5 TO 12 FEET ELSEWHERE IN THE HURRICANE WARNING AREA. EVACUATION OF THE LOW LYING AREA THAT WILL BE AFFECTED BY THESE TIDES SHOULD BE DONE AS EARLY AS POSSIBLE BEFORE ESCAPE ROUTES ARE CLOSED. THE CENTER OF CAMILLE IS EXPECTED TO PASS CLOSE TO THE MOUTH OF THE MISSISSIPPI RIVER LATE THIS AFTERNOON AND MOVE INLAND ON THE MISSISSIPPI COAST TONIGHT.

SEVERAL TORNADOES ARE LIKELY OVER EXTREME SOUTHEAST LOUISIANA EASTWARD TO FORT WALTON FLORIDA AND UP TO 100 MILES INLAND THIS AFTERNOON AND TONIGHT.

HEAVY RAIN WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEASTERN MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE THIS AFTERNOON AND TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY LOCAL WEATHER BUREAU OFFICES.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND TAKE ALL NECESSARY HURRICANE PRECAUTIONS IMMEDIATELY.

AT 1 PM CDT...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 28.1 NORTH...LONGITUDE 88.6 WEST...OR ABOUT 155 MILES SOUTHEAST OF NEW ORLEANS. CAMILLE WAS MOVING NORTH NORTHWEST 12 TO 15 MPH. A CHANGE TO A SLIGHTLY MORE NORTHERLY COURSE IS LIKELY AS THE CENTER APPROACHES THE COAST.

HIGHEST WINDS ARE ESTIMATED 160 MPH NEAR THE CENTER AND LITTLE CHANGE IN INTENSITY IS EXPECTED.

REPEATING THE 1 PM POSITION...28.1 NORTH...88.6 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM AND A BULLETIN AT 3 PM CDT.

CONNER

SPECIAL ADVISORY NO. 18 3 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CENTER NEAR THE MOUTH OF THE MISSISSIPPI RIVER...BEARING DOWN ON THE MISSISSIPPI ALABAMA COAST...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED BEFORE DARK. DISCONTINUE WARNINGS EAST OF APALACHICOLA.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. WINDS AT THE MOUTH OF THE MISSISSIPPI RIVER ARE NOW NEAR HURRICANE FORCE. GALES IN SQUALLS ARE SPREADING INLAND OVER THE WARNING AREA AND WINDS WILL REACH HURRICANE FORCE OVER MUCH OF THE AREA FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...ALABAMA...AND INTO EXTREME NORTHWEST FLORIDA LATER THIS AFTERNOON OR BY EARLY TONIGHT. THE FOLLOWING TIDES ARE EXPECTED TONIGHT AS CAMILLE MOVES INLAND...MISSISSIPPI COAST GULFPORT TO PASCAGOULA 15 TO 20 FEET...PASCAGOULA TO MOBILE 10 TO 15 FEET...EAST OF MOBILE TO PENSACOLA 6 TO 10 FEET. ELSEWHERE IN THE AREA OF HURRICANE DISPLAY EAST OF THE MISSISSIPPI RIVER 5 TO 8 FEET. IMMEDIATE EVACUATION OF AREAS THAT WILL BE AFFECTED BY THESE TIDES IS ADVISED.

THE CENTER OF CAMILLE IS EXPECTED TO PASS CLOSE TO THE MOUTH OF THE MISSISSIPPI RIVER LATE THIS AFTERNOON AND MOVE INLAND ON THE MISSISSIPPI COAST NEAR GULFPORT EARLY TONIGHT.

SEVERAL TORNADOES ARE LIKELY OVER EXTREME SOUTHEAST LOUISIANA EASTWARD TO FORT WALTON FLORIDA AND UP TO 100 MILES INLAND THIS AFTERNOON AND TONIGHT.

HEAVY RAIN WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEASTERN MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE THIS AFTERNOON AND TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND TAKE ALL NECESSARY HURRICANE PRECAUTIONS IMMEDIATELY.

AT 3 PM CDT...2002...HURRICANE CAMILLE WAS LOCATED NEAR LATITUDE 28.6 NORTH...LONGITUDE 88.8 WEST...OR ABOUT 120 MILES SOUTHEAST OF NEW ORLEANS. CAMILLE WAS MOVING NORTH NORTHWEST 15 TO 18 MPH.

AN AIR FORCE RECON FLIGHT INTO CAMILLE THIS AFTERNOON ESTIMATED THE WINDS 190 MPH NEAR THE CENTER. THE CENTRAL PRESSURE WAS 26.61 INCHES. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER.

REPEATING THE 3 PM POSITION...28.6 NORTH...88.8 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 PM AND BULLETINS AT 7 AND 9 PM CDT.

CONNER

ADVISORY NO. 17 5 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CENTER NEAR THE MOUTH OF THE MISSISSIPPI RIVER...BEARING DOWN ON THE MISSISSIPPI ALABAMA COAST...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED BEFORE DARK.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. HURRICANE FORCE WINDS ARE NOW OCCURRING AT THE MOUTH OF THE MISSISSIPPI RIVER. GALES IN SQUALLS ARE SPREADING INLAND OVER THE WARNING AREA AND WINDS WILL REACH HURRICANE FORCE OVER MUCH OF THE AREA FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...ALABAMA...AND INTO EXTREME NORTHWEST FLORIDA LATER THIS AFTERNOON OR BY EARLY TONIGHT. THE FOLLOWING TIDES ARE EXPECTED TONIGHT AS CAMILLE MOVES INLAND...MISSISSIPPI COAST GULFPORT TO PASCAGOULA 15 TO 20 FEET...PASCAGOULA TO MOBILE 10 TO 15 FEET...EAST OF MOBILE TO PENSACOLA 6 TO 10 FEET. ELSEWHERE IN THE AREA OF HURRICANE WARNING EAST OF THE MISSISSIPPI RIVER 5 TO 8 FEET. IMMEDIATE EVACUATION OF AREAS THAT WILL BE AFFECTED BY THESE TIDES IS ADVISED.

THE CENTER OF CAMILLE IS EXPECTED TO MOVE INLAND ON THE MISSISSIPPI COAST NEAR GULFPORT EARLY TONIGHT.

SEVERAL TORNADOES ARE LIKELY OVER EXTREME SOUTHEAST LOUISIANA EASTWARD TO FORT WALTON FLORIDA AND UP TO 100 MILES INLAND THROUGH TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND CONTINUE ALL NECESSARY HURRICANE PRECAUTIONS.

AT 5 PM CDT...2202...THE CENTER OF HURRICANE CAMILLE WAS NEAR LATITUDE 29.0 NORTH...LONGITUDE 88.9 WEST OR ABOUT 95 MILES SOUTHEAST OF NEW ORLEANS. CAMILLE WAS MOVING NORTH NORTHWEST ABOUT 15 MPH.

HIGHEST WINDS ARE ESTIMATED 190 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER. THE AIR FORCE RECON FLIGHT INTO CAMILLE THIS AFTERNOON REPORTED A CENTRAL PRESSURE OF 26.61 INCHES.

REPEATING THE 5 PM POSITION...29.0 NORTH...88.9 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM AND BULLETINS AT 7 AND 9 PM CDT.

CONNER

BULLETIN 7 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CENTER SKIRTED MOUTH OF THE MISSISSIPPI RIVER...TAKES AIM ON THE MISSISSIPPI ALABAMA COAST...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. PREPARATIONS AGAINST THIS EXTREMELY DANGEROUS HURRICANE SHOULD BE COMPLETED IMMEDIATELY.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. HURRICANE FORCE WINDS ARE NOW OCCURRING AT THE MOUTH OF THE MISSISSIPPI RIVER. GALES IN SQUALLS ARE SPREADING INLAND OVER THE WARNING AREA AND WINDS WILL REACH HURRICANE FORCE OVER MUCH OF THE AREA FROM SOUTHEAST LOUISIANA ACROSS COASTAL MISSISSIPPI...COASTAL ALABAMA...AND INTO EXTREME NORTHWEST FLORIDA EARLY TONIGHT. THE FOLLOWING TIDES ARE EXPECTED TONIGHT AS CAMILLE MOVES INLAND...MISSISSIPPI COAST GULFPORT TO PASCAGOULA 15 TO 20 FEET...PASCAGOULA TO MOBILE 10 TO 15 FEET...EAST OF MOBILE TO PENSACOLA 6 TO 10 FEET. ELSEWHERE IN THE AREA OF HURRICANE WARNING EAST OF THE MISSISSIPPI RIVER 5 TO 8 FEET. IMMEDIATE EVACUATION OF AREAS THAT WILL BE AFFECTED BY THESE TIDES IS URGED.

THE CENTER OF CAMILLE IS EXPECTED TO MOVE INLAND ON THE MISSISSIPPI COAST NEAR GULFPORT EARLY TONIGHT.

SEVERAL TORNADOES ARE LIKELY OVER EXTREME SOUTHEAST LOUISIANA EASTWARD TO FORT WALTON FLORIDA AND UP TO 100 MILES INLAND THROUGH TONIGHT.

HEAVY RAINS WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEAST MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES.

ALL INTERESTS ALONG THE NORTHEASTERN GULF COAST ARE URGED TO LISTEN FOR LATER RELEASES AND CONTINUE ALL NECESSARY HURRICANE PRECAUTIONS.

AT 7 PM CDT...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 29.5 NORTH...LONGITUDE 89.1 WEST...OR ABOUT 70 MILES EAST SOUTHEAST OF NEW ORLEANS AND 60 MILES SOUTH OF GULFPORT MISSISSIPPI. CAMILLE WAS MOVING NORTH NORTHWEST ABOUT 15 MPH.

HIGHEST WINDS ARE ESTIMATED 190 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER. THE AIR FORCE RECON FLIGHT INTO CAMILLE THIS AFTERNOON REPORTED A CENTRAL PRESSURE OF 26.61 INCHES.

WIND GUSTING TO NEAR 80 MPH AT BOOTHVILLE AND TO NEAR 60 MPH AT NEW ORLEANS WEATHER BUREAU OFFICE AT 6 PM.

REPEATING THE 7 PM POSITION...29.5 NORTH...89.1 WEST

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM AND A BULLETIN AT 9 PM CDT.

SLOAN

BULLETIN 9 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...EXTREMELY DANGEROUS...CENTER HAS PASSED MOUTH OF THE MISSISSIPPI RIVER...CONTINUES TOWARD THE MISSISSIPPI ALABAMA COAST...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. CONTINUE ALL PRECAUTIONS.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. HURRICANE FORCE WINDS ARE NOW OCCURRING OVER EXTREME SOUTHEAST LOUISIANA AND WILL BE SPREADING OVER MOST OF THE WARNING AREA WITHIN THE NEXT FEW HOURS.

THE FOLLOWING TIDES ARE EXPECTED TONIGHT AS CAMILLE MOVES INLAND...MISSISSIPPI COAST GULFPORT TO PASCAGOULA 15 TO 20 FEET... PASCAGOULA TO MOBILE 10 TO 15 FEET...EAST OF MOBILE TO PENSACOLA 6 TO 10 FEET. ELSEWHERE IN THE AREA OF HURRICANE WARNING EAST OF THE MISSISSIPPI RIVER 5 TO 8 FEET. IMMEDIATE EVACUATION OF AREAS THAT WILL BE AFFECTED BY THESE HIGH TIDES IS URGENTLY ADVISED.

THE CENTER OF CAMILLE IS EXPECTED TO MOVE INLAND ON THE MISSISSIPPI COAST NEAR GULFPORT BEFORE MIDNIGHT.

SEVERAL TORNADES ARE LIKELY TONIGHT WITHIN 100 MILES OF THE COAST FROM EXTREME SOUTHEASTERN LOUISIANA TO FORT WALTON BEACH FLORIDA.

HEAVY RAINS WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEAST MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE TONIGHT. ANY FLOOD STATEMENTS NEEDED WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES.

AT 9 PM CDT...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 29.9 NORTH... LONGITUDE 89.1 WEST...OR ABOUT 35 MILES SOUTH OF GULFPORT MISSISSIPPI AND 60 MILES EAST OF NEW ORLEANS. CAMILLE WILL CONTINUE NORTHWARD ABOUT 15 MPH.

HIGHEST WINDS ARE ESTIMATED 190 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER. THE AIR FORCE RECON FLIGHT INTO CAMILLE THIS AFTERNOON REPORTED A CENTRAL PRESSURE OF 26.61 INCHES.

THOSE IN THE PATH OF THE EYE ARE REMINDED THAT THE WINDS WILL DIE DOWN SUDDENLY IF THE EYE PASSES OVER YOUR AREA BUT THE WINDS WILL INCREASE AGAIN RAPIDLY AND FROM THE OPPOSITE DIRECTION AS THE EYE MOVES AWAY. THE LULL WITH CAMILLE WILL PROBABLY LAST FROM A FEW MINUTES TO ONE HALF HOUR AND PERSONS SHOULD NOT VENTURE FAR FROM SAFE SHELTER.

WINDS GUSTED TO SLIGHTLY OVER 100 MPH AT BOOTHVILLE LOUISIANA ABOUT 7 PM. NEW ORLEANS WEATHER BUREAU OFFICE WAS REPORTING WINDS 45 TO 50 MPH WITH GUSTS TO NEAR 70 MPH AT 8 PM.

REPEATING THE 9 PM POSITION...29.9 NORTH...89.1 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 PM AND BULLETIN AT 1 AND 3 AM CDT.

SLOAN

ADVISORY NO. 18 11 PM CDT SUNDAY AUGUST 17, 1969

...CAMILLE...MOVING INLAND NEAR GULFPORT MISSISSIPPI...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. CONTINUE ALL PRECAUTIONS.

WINDS ARE INCREASING AND TIDES ARE RISING ALONG THE NORTHERN GULF COAST FROM GRAND ISLE EASTWARD. HURRICANE FORCE WINDS ARE NOW OCCURRING OVER MOST OF THE WARNING AREA.

THE FOLLOWING TIDES ARE EXPECTED TONIGHT AS CAMILLE MOVES INLAND...MISSISSIPPI COAST ...GULFPORT TO PASCAGOULA 15 TO 20 FEET... PASCAGOULA TO MOBILE 10 TO 15 FEET...EAST OF MOBILE TO PENSACOLA 6 TO 10 FEET. ELSEWHERE IN THE AREA OF HURRICANE WARNING EAST OF THE MISSISSIPPI RIVER 5 TO 8 FEET. IMMEDIATE EVACUATION OF AREAS THAT WILL BE AFFECTED BY THESE HIGH TIDES IS URGENTLY ADVISED.

SEVERAL TORNADES ARE LIKELY TONIGHT WITHIN 100 MILES OF THE COAST IN THE AREA OF SOUTHEASTERN MISSISSIPPI EASTWARD TO FORT WALTON BEACH FLORIDA.

HEAVY RAINS WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEAST MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE TONIGHT. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED.

AT 11 PM CDT...0400Z...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 30.3 NORTH...LONGITUDE 89.1 WEST...OR NEAR GULFPORT MISSISSIPPI.

HIGHEST WINDS ARE ESTIMATED 150 MPH NEAR THE CENTER. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER.

THOSE IN THE PATH OF THE EYE ARE REMINDED THAT THE WINDS WILL DIE DOWN SUDDENLY IF THE EYE PASSES OVER YOUR AREA BUT THE WINDS WILL INCREASE AGAIN RAPIDLY AND FROM THE OPPOSITE DIRECTION AS THE EYE MOVES AWAY. THE LULL WITH CAMILLE WILL PROBABLY LAST FROM A FEW MINUTES TO ONE HALF HOUR AND PERSONS SHOULD NOT VENTURE FAR FROM SAFE SHELTER.

HURRICANE CAMILLE HAS BEGUN TO FILL AND WILL WEAKEN QUITE RAPIDLY AS IT CONTINUES NORTHWARD THROUGH MISSISSIPPI AT ABOUT 15 MILES TONIGHT AND MONDAY. WINDS AND SEAS WILL GRADUALLY DIMINISH MONDAY AS CAMILLE MOVES AWAY FROM THE COAST. WARNINGS WILL BE DISCONTINUED MONDAY.

REPEATING THE 11 PM POSITION...30.3 NORTH...89.1 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM WITH BULLETINS AT 1 AND 3 AM CDT.

HILL

BULLETIN 1 AM CDT MONDAY AUGUST 18, 1969

...CAMILLE...BATTERING MISSISSIPPI COAST...HEADS INLAND.

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. CONTINUE ALL PRECAUTIONS.

HURRICANE WINDS ARE OCCURRING FROM EXTREME SOUTHEAST LOUISIANA EASTWARD ACROSS THE MISSISSIPPI COAST WITH A FEW SQUALLS TO HURRICANE SPEED LIKELY ACROSS COASTAL ALABAMA INTO NORTHWEST FLORIDA.

TIDES ARE RUNNING 10 TO 20 FEET ABOVE NORMAL ON THE MISSISSIPPI COAST AND 5 TO 10 FEET ELSEWHERE FROM SOUTHEAST LOUISIANA TO NORTHWEST FLORIDA.

SEVERAL TORNADOES ARE LIKELY TONIGHT WITHIN 100 MILES OF THE COAST IN THE AREA OF SOUTHEASTERN MISSISSIPPI EASTWARD TO FORT WALTON BEACH FLORIDA.

HEAVY RAINS WITH LOCAL AMOUNTS 8 TO 10 INCHES WILL SPREAD INTO SOUTHEAST MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE TONIGHT. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED.

AT 1 AM CDT...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 30.6 NORTH... LONGITUDE 89.5 WEST...OR 10 TO 15 MILES EAST OF PICAYUNE MISSISSIPPI.

HIGHEST WINDS ARE ESTIMATED 140 MPH NEAR THE CENTER ALONG THE MISSISSIPPI COAST. HURRICANE FORCE WINDS EXTEND OUTWARD 60 MILES AND GALES EXTEND OUTWARD 180 MILES FROM THE CENTER.

THOSE IN THE PATH OF THE EYE ARE REMINDED THAT THE WINDS WILL DIE DOWN SUDDENLY IF THE EYE PASSES OVER YOUR AREA BUT THE WINDS WILL INCREASE AGAIN RAPIDLY AND FROM THE OPPOSITE DIRECTION AS THE EYE MOVES AWAY. THE LULL WITH CAMILLE WILL PROBABLY LAST FROM A FEW MINUTES TO ONE HALF HOUR AND PERSONS SHOULD NOT VENTURE FAR FROM SAFE SHELTER.

HURRICANE CAMILLE HAS BEGUN TO FILL AND WILL WEAKEN QUITE RAPIDLY AS IT CONTINUES GENERALLY NORTHWARD THROUGH MISSISSIPPI AT ABOUT 15 MILES AN HOUR TONIGHT AND MONDAY. WINDS AND SEAS WILL GRADUALLY DIMINISH MONDAY AS CAMILLE MOVES AWAY FROM THE COAST. WARNINGS WILL BE DISCONTINUED MONDAY.

KEESLER AIR FORCE BASE AT BILOXI REPORTED 20 FEET TIDES AND 125 TO 150 MPH WIND AT 1030 PM CDT. LAKEFRONT AIRPORT IN NEW ORLEANS REPORTED GUSTS IN EXCESS OF 100 MPH AT 11 PM CDT.

REPEATING THE 1 AM POSITION...30.6 NORTH...89.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM WITH A BULLETIN AT 3 AM CDT.

HILL

BULLETIN 3 AM CDT MONDAY AUGUST 18, 1969

...CAMILLE...BEGINS TO WEAKEN OVER SOUTHERN MISSISSIPPI...DRENCHES THE AREA WITH HEAVY RAINS.

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. CONTINUE ALL PRECAUTIONS.

HURRICANE WINDS ARE OCCURRING NEAR THE CENTER OF CAMILLE WITH A FEW SQUALLS TO HURRICANE SPEED LIKELY ACROSS COASTAL AREAS FROM EXTREME SOUTHEAST LOUISIANA INTO NORTHWEST FLORIDA.

TIDES ARE RUNNING 10 TO 20 FEET ABOVE NORMAL ON THE MISSISSIPPI COAST AND 5 TO 10 FEET ELSEWHERE FROM SOUTHEAST LOUISIANA TO NORTHWEST FLORIDA BUT WILL RECEDE SLOWLY MONDAY.

A FEW TORNADOES ARE LIKELY THE REMAINDER OF TONIGHT WITHIN 100 MILES OF THE COAST IN THE AREA OF SOUTHEASTERN MISSISSIPPI EASTWARD TO FORT WALTON BEACH FLORIDA.

HEAVY RAINS WITH LOCAL AMOUNTS 8 TO 10 INCHES ARE SPREADING INTO SOUTHERN MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED.

AT 3 AM CDT...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 31.2 NORTH... LONGITUDE 89.8 WEST OR ABOUT 20 MILES WEST SOUTHWEST OF HATTIESBURG MISSISSIPPI.

HIGHEST WINDS ARE ESTIMATED 120 MPH NEAR THE CENTER AND IN SQUALLS ALONG THE MISSISSIPPI COAST. GALES EXTEND OUTWARD 100 MILES FROM THE CENTER EXCEPT 180 MILES IN THE SOUTHEAST QUADRANT.

PERSONS IN THE PATH OF THE EYE ARE REMINDED THAT THE WINDS WILL DIE DOWN SUDDENLY IF THE EYE PASSES OVER YOUR AREA BUT THE WINDS WILL INCREASE AGAIN RAPIDLY AND FROM THE OPPOSITE DIRECTION AS THE EYE MOVES AWAY. THE LULL WITH CAMILLE WILL PROBABLY LAST FROM A FEW MINUTES TO ONE HALF HOUR AND PERSONS SHOULD NOT VENTURE FAR FROM SAFE SHELTER.

HURRICANE CAMILLE HAS BEGUN TO FILL AND WILL WEAKEN QUITE RAPIDLY AS IT CONTINUES GENERALLY NORTHWARD THROUGH MISSISSIPPI AT ABOUT 15 MILES AN HOUR TONIGHT AND MONDAY. WINDS AND SEAS WILL GRADUALLY DIMINISH MONDAY AS CAMILLE CONTINUES TO MOVE AWAY FROM THE COAST. WARNINGS WILL BE DISCONTINUED MONDAY.

REPEATING THE 3 AM POSITION...31.2 NORTH...89.8 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 5 AM.

HILL

ADVISORY NUMBER 19 5 AM CDT MONDAY AUGUST 18, 1969

...CAMILLE...DUMPS HEAVY RAINS...CONTINUES TO WEAKEN...

HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD ACROSS THE MISSISSIPPI...ALABAMA...AND NORTHWEST FLORIDA COAST TO APALACHICOLA. GALE WARNINGS ARE IN EFFECT FROM MORGAN CITY TO GRAND ISLE. CONTINUE ALL PRECAUTIONS.

HIGHEST WINDS ARE ESTIMATED 100 MPH NEAR THE CENTER OF CAMILLE AND IN SQUALLS ALONG THE MISSISSIPPI COAST. A FEW SQUALLS REACHING HURRICANE SPEEDS ARE LIKELY ELSEWHERE ALONG THE COAST FROM SOUTHEAST LOUISIANA TO THE FLORIDA PANHANDLE. GALES EXTEND OUTWARD FROM THE CENTER 200 MILES IN THE SOUTHEAST QUADRANT AND 100 MILES ELSEWHERE.

TIDES ARE RUNNING 10 TO 20 FEET ABOVE NORMAL ON THE MISSISSIPPI COAST AND 5 TO 10 FEET ELSEWHERE FROM SOUTHEAST LOUISIANA TO NORTHWEST FLORIDA. TIDES WILL RECEDE SLOWLY MONDAY.

A FEW TORNADES ARE LIKELY THIS MORNING OVER SOUTHEASTERN MISSISSIPPI...COASTAL ALABAMA...AND WESTERN PORTIONS OF THE FLORIDA PANHANDLE.

HEAVY RAINS WITH LOCAL ACCUMULATIONS OF 8 TO 10 INCHES CONTINUE OVER SOUTHERN MISSISSIPPI...SOUTHWEST ALABAMA...AND THE FLORIDA PANHANDLE. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED. THE HEAVY RAINS WILL SPREAD INTO NORTHERN MISSISSIPPI TODAY AND GRADUALLY DIMINISH ELSEWHERE.

AT 5 AM CDT...1000Z...THE CENTER OF HURRICANE CAMILLE WAS LOCATED BY NEW ORLEANS AND OTHER LAND BASED RADARS NEAR LATITUDE 31.5 NORTH...LONGITUDE 90.0 WEST...OR ABOUT 40 MILES SOUTH SOUTHEAST OF JACKSON.

HURRICANE CAMILLE IS FILLING AND WILL WEAKEN QUITE RAPIDLY AS IT CONTINUES GENERALLY NORTHWARD THROUGH MISSISSIPPI AT ABOUT 15 MPH TODAY. WINDS AND SEAS WILL GRADUALLY DIMINISH MONDAY AS CAMILLE CONTINUES TO MOVE AWAY FROM THE COAST. WARNINGS WILL BE DISCONTINUED MONDAY.

REPEATING THE 5 AM POSITION...31.5 NORTH...90.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU AT 11 AM AND A BULLETIN AT 8 AM.

HILL

BULLETIN 8 AM CDT MONDAY AUGUST 18, 1969

...WEAKENING CAMILLE MOVING NORTHWARD IN CENTRAL MISSISSIPPI...

WARNINGS ALONG THE NORTHERN GULF COAST WILL BE DISCONTINUED AT 11 AM CDT. HURRICANE WARNINGS ARE IN EFFECT FROM NEW ORLEANS AND GRAND ISLE LOUISIANA EASTWARD TO APALACHICOLA AND GALE WARNINGS FROM MORGAN CITY TO GRAND ISLE.

AT 8 AM CDT THE CENTER OF CAMILLE WAS LOCATED NEAR LATITUDE 32.3 NORTH...LONGITUDE 90.0 WEST OR ABOUT 20 MILES EAST OF JACKSON MISSISSIPPI AND MOVING NORTHWARD 18 MPH.

HIGHEST WINDS ARE ESTIMATED 80 MPH NEAR THE CENTER. GALES IN SCATTERED SQUALLS CONTINUE ALONG THE COAST FROM SOUTHEAST LOUISIANA TO THE FLORIDA PANHANDLE.

TIDES ARE FALLING ALONG THE COAST BUT MANY AREAS ARE STILL INUNDATED. WINDS AND TIDES WILL CONTINUE TO DIMINISH TODAY.

HEAVY RAINS WITH LOCAL ACCUMULATIONS 5 TO 8 INCHES ARE EXPECTED IN NORTHERN MISSISSIPPI TODAY AND TONIGHT AND HEAVY RAIN WILL SPREAD INTO WESTERN TENNESSEE AND WESTERN KENTUCKY TONIGHT AND TUESDAY. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED.

CAMILLE WILL CONTINUE TO WEAKEN AS IT MOVES THROUGH NORTHERN MISSISSIPPI TODAY.

REPEATING THE 8 AM POSITION...32.3 NORTH...90.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NEW ORLEANS WEATHER BUREAU OFFICE AT 11 AM CDT.

CONNOR

ADVISORY NO. 20 11 AM CDT MONDAY AUGUST 18, 1969

...CAMILLE CONTINUES TO WEAKEN AS IT MOVES NORTHWARD IN CENTRAL MISSISSIPPI...

DISCONTINUE WARNINGS ALONG THE NORTHERN GULF COAST AT 11 AM CDT.

AT 11 AM CDT...1600Z...THE CENTER OF CAMILLE WAS LOCATED NEAR LATITUDE 33.0 NORTH...LONGITUDE 90.1 WEST...OR ABOUT 50 MILES NORTH OF JACKSON MISSISSIPPI AND MOVING NORTHWARD 18 MPH.

HIGHEST WINDS ARE ESTIMATED 50 MPH NEAR THE CENTER. A FEW SQUALLS WILL CONTINUE ALONG THE NORTHERN GULF COAST FROM SOUTHEAST LOUISIANA TO THE FLORIDA PANHANDLE TODAY.

TIDES ARE FALLING ALONG THE COAST BUT MANY AREAS ARE STILL INUNDATED. WINDS AND TIDES WILL CONTINUE TO DIMINISH TODAY AND TONIGHT.

HEAVY RAINS WITH LOCAL ACCUMULATIONS UP TO 5 INCHES ARE EXPECTED IN NORTHERN MISSISSIPPI TODAY AND TONIGHT AND HEAVY RAIN WILL SPREAD INTO WESTERN TENNESSEE AND WESTERN KENTUCKY TONIGHT AND TUESDAY. FLOOD STATEMENTS WILL BE ISSUED BY THE LOCAL WEATHER BUREAU OFFICES AS NEEDED.

CAMILLE WILL CONTINUE TO WEAKEN AS IT MOVES THROUGH NORTHERN MISSISSIPPI TODAY.

SMALL CRAFT NORTHERN GULF COAST SHOULD REMAIN IN PORT UNTIL WINDS AND SEAS SUBSIDE.

REPEATING THE 11 AM POSITION...33.0 NORTH...90.1 WEST.

THIS IS THE LAST ADVISORY ON CAMILLE BUT A BULLETIN WILL BE ISSUED BY THE KANSAS CITY WEATHER BUREAU OFFICE AT 2 PM IF NEEDED.
CONNER

KANSAS CITY

BULLETIN 2 PM CDT MONDAY AUGUST 18, 1969

...REMNANTS OF CAMILLE WEAKENING RAPIDLY...HEAVY RAINS AND FLASH FLOODING POSE THREAT TO NORTHERN MISSISSIPPI...WESTERN TENNESSEE...
EASTERN ARKANSAS...SOUTHEAST MISSOURI...WESTERN KENTUCKY...AND SOUTHERN ILLINOIS.

AT 2 PM CDT...1900Z...THE CENTER OF RAPIDLY WEAKENING CAMILLE WAS LOCATED NEAR LATITUDE 33.5 NORTH...LONGITUDE 90.1 WEST IN THE
VICINITY OF GREENWOOD MISSISSIPPI AND MOVING NORTHWARD AT 17 MILES AN HOUR.

HIGHEST WINDS ARE ESTIMATED 45 MPH NEAR THE CENTER WITH A FEW SQUALLS SURROUNDING THE DYING STORM TO THE NORTH AND EAST. WINDS
WILL CONTINUE TO DIMINISH THROUGHOUT THIS AFTERNOON AND EARLY EVENING.

WINDS AND TIDES WILL CONTINUE TO DIMINISH ALONG THE GULF COAST TODAY AND TONIGHT.

HEAVY RAINS WITH LOCAL ACCUMULATIONS UP TO 4 INCHES ARE EXPECTED IN EXTREME NORTHERN MISSISSIPPI TODAY AND THE HEAVY RAINS WILL
SPREAD INTO WESTERN TENNESSEE...WESTERN KENTUCKY...EASTERN ARKANSAS...AND SOUTHEASTERN MISSOURI TONIGHT. FURTHER STATEMENTS AND
POSSIBLE FLASH FLOOD WARNINGS WILL BE ISSUED BY LOCAL WEATHER BUREAU OFFICES. MANY OF THESE AREAS HAD EXTENSIVE RAINS OVER THE
WEEKEND SO THAT ANY FUTURE RAIN WILL RUN OFF QUICKLY.

REPEATING THE 2 PM POSITION...33.5 NORTH...90.1 WEST.

NO FURTHER BULLETINS ON CAMILLE ARE PLANNED BY THE KANSAS CITY WEATHER BUREAU. FURTHER STATEMENTS CONCERNING FLOODS AND RAINFALL
WILL BE ISSUED BY WEATHER BUREAU OFFICES IN THE AREAS NOTED..

PEARSON

WASHINGTON DC

BULLETIN 6 AM EDT THURSDAY AUGUST 21, 1969

...CAMILLE NOW AN ATLANTIC STORM...

THE REMAINS OF CAMILLE AFTER CAUSING TORRENTIAL RAINS IN PARTS OF VIRGINIA TUESDAY NIGHT AND WEDNESDAY FORENOON MOVED OFF THE
MIDDLE ATLANTIC COAST WEDNESDAY AFTERNOON.

CAMILLE IS NOW GAINING STRENGTH IN THE ATLANTIC WHILE MOVING RAPIDLY EASTWARD.

AT 6 AM EDT THE STORM CENTER WAS ESTIMATED TO BE ABOUT 300 MILES NORTHWEST OF BERMUDA AND 400 MILES EAST OF THE VIRGINIA CAPES.
THE CENTER IS MOVING EASTWARD 20 TO 25 MPH. WINDS HAVE INCREASED TO ABOUT 50 MPH NEAR THE CENTER AND GALES EXTEND OUTWARD ABOUT
150 MILES.

CAMILLE IS PRIMARILY OF CONCERN TO ATLANTIC SHIPPING. INDICATIONS ARE THAT THE STORM MAY BECOME STRONGER TODAY.

ANOTHER RELEASE WILL BE MADE AT NOON EDT TODAY.

WINNER

MIAMI

BULLETIN 9 AM EDT THURSDAY AUGUST 21, 1969

...FORECAST...CAMILLE TO PASS NORTH AND DEBBIE SOUTHEAST OF BERMUDA LATE TODAY OR EARLY TONIGHT.

AT 9 AM EDT...CAMILLE NEAR LATITUDE 35 NORTH...LONGITUDE 68 WEST AND DEBBIE NEAR LATITUDE 28.6 NORTH AND 64.7 WEST...CAMILLE 265
MILES NORTHWEST AND DEBBIE THE SAME DISTANCE SOUTH OF BERMUDA.

CAMILLE CARRIES WINDS OF 50 MPH OR BETTER AND HURRICANE DEBBIE 110 MPH NEAR THE CENTER.

CAMILLE IS MOVING TOWARD THE EAST 20 MPH AND DEBBIE TOWARD THE NORTH NORTHEAST 12 TO 15 MPH. ON THE FORECAST TRACKS AT THE
CLOSEST POINTS BOTH WILL COME WITHIN ABOUT 150 MILES OF BERMUDA.

THE WINDS AROUND THE TWO WILL BE FIGHTING EACH OTHER AND IT IS TO BERMUDA'S ADVANTAGE SINCE THIS WILL WEAKEN THE WINDS THAT BERMUDA
WILL GET FROM EITHER ONE. HOWEVER BERMUDA MAY GET GALE FORCE WINDS.

THE FORECAST PATHS WILL BRING CAMILLE AND DEBBIE WITHIN TWO TO THREE HUNDRED MILES OF EACH OTHER LATE TODAY OR TONIGHT. IT APPEARS
TO BE A RACE AS TO WHICH WILL LEAD THE OTHER ON A NORTHEASTERLY TRACK WELL OUT IN THE ATLANTIC FRIDAY.

ADVISORIES WILL BE RESUMED ON CAMILLE AT NOON AND THE REGULAR ADVISORY ON DEBBIE AT THE SAME TIME FROM THE NATIONAL HURRICANE
CENTER IN MIAMI.

KRAFT

WASHINGTON DC

HURRICANE ADVISORY NO. 21 12 NOON EDT THURSDAY AUGUST 21, 1969

...REJUVENATED CAMILLE APPROACHING THE NEW YORK TO EUROPE SHIPPING LANES...

AT NOON EDT...1600Z ... TROPICAL STORM CAMILLE WAS LOCATED NEAR 37.5 NORTH LATITUDE 68.0 WEST LONGITUDE...OR ABOUT 400 MILES EAST
OF THE VIRGINIA CAPES. CAMILLE IS PRESENTLY MOVING EASTWARD ABOUT 22 MPH.

THE HIGHEST WINDS ARE 55 TO 60 MPH OVER A SMALL AREA NEAR THE CENTER AND GALE WINDS EXTEND OUTWARD 100 MILES IN THE SOUTHERN QUADRANTS AND 30 MILES IN THE NORTHERN QUADRANTS.

THE TORRENTIAL RAIN IN PARTS OF VIRGINIA TUESDAY NIGHT AND WEDNESDAY FORENOON IS STILL CAUSING FLOODING IN PARTS OF VIRGINIA TODAY. CAMILLE IS NOW OF PRIMARY CONCERN TO SHIPPING IN THE NORTH ATLANTIC.

THE FORECAST IS FOR CAMILLE TO INCREASE ITS FORWARD SPEED TO ABOUT 30 MPH AND GRADUALLY TURN FROM ITS EASTWARD COURSE TO EAST NORTHEASTWARD DURING THE NEXT 24 HOURS.

COOLER AND DRIER AIR TO THE NORTH AND WEST OF CAMILLE SHOULD GRADUALLY INFILTRATE INTO THE STORM AND CAUSE IT TO ASSUME THE CHARACTERISTICS OF A HIGHER LATITUDE STORM OVER THE ATLANTIC.

REPEATING THE NOON EDT POSITION...37.5 NORTH...68.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER IN MIAMI AT 6 PM EDT TODAY.

HOOVER

MIAMI

ADVISORY NO. 22 6 PM EDT THURSDAY AUGUST 21, 1969

...CAMILLE ACCELERATES EASTWARD...INTENSIFIES SOME...

LATE SHIP REPORTS AND SATELLITE PICTURES SHOW THAT CAMILLE IS ACCELERATING EASTWARD AND IS NOW MOVING 35 MPH. AT 6 PM EDT... 2200Z...CAMILLE WAS ESTIMATED NEAR LATITUDE 37.5 NORTH...LONGITUDE 62.0 WEST...OR ABOUT 775 MILES SOUTHWEST OF CAPE RACE NEWFOUNDLAND.

HIGHEST WINDS ARE 65 TO 70 MPH OVER A SMALL AREA NEAR THE CENTER AND GALE WINDS EXTEND OUTWARD 200 MILES IN THE SOUTHERN QUADRANTS AND 100 MILES IN THE NORTHERN QUADRANTS.

CAMILLE IS FORECAST TO MOVE ON AN EAST TO EAST NORTHEAST COURSE AT LEAST 35 MPH DURING THE NEXT 24 HOURS.

AT THE PRESENT TIME CAMILLE IS OF CONCERN ONLY TO SHIPPING.

REPEATING THE 6 PM EDT POSITION...37.5 NORTH...62.0 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER IN MIAMI AT MIDNIGHT EDT.

CLARK

ADVISORY NO. 23 12 MIDNIGHT EDT FRIDAY AUGUST 22, 1969

...CAMILLE HEADS FOR NORTH ATLANTIC GRAVE YARD...

AT MIDNIGHT...0400Z...SPARSE SHIPS LOCATED CAMILLE NEAR LATITUDE 40.5 NORTH...LONGITUDE 59.5 WEST. THIS POSITION IS 575 MILES SOUTHWEST OF ST. JOHNS NEWFOUNDLAND.

CAMILLE IS RACING TOWARDS THE NORTHEAST 35 MPH AND IS EXPECTED TO PASS AROUND 200 MILES SOUTH OF NEWFOUNDLAND EARLY SATURDAY MORNING. THE STORM IS FORECAST TO GRADUALLY LOSE TROPICAL CHARACTERISTICS DURING THE NEXT 24 HOURS.

MAXIMUM WINDS ARE 65 TO 70 MPH.

REPEATING THE MIDNIGHT EDT POSITION...40.5 NORTH...59.5 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER IN MIAMI AT 6 AM EDT.

FRANK

ADVISORY NO. 24 6 AM EDT FRIDAY AUGUST 22, 1969

...CAMILLE NEARS NORTH ATLANTIC GRAVE...

AT 6 AM EDT CAMILLE WAS SOME 350 MILES SOUTH OF NEWFOUNDLAND...AROUND LATITUDE 42 NORTH...LONGITUDE 56 WEST. HIGHEST WINDS ARE ESTIMATED 55 MPH. THE STORM IS SPEEDING NORTHEASTWARD AT 35 MPH OR MORE.

CAMILLE WILL WEAKEN TODAY AND LOSE HER TROPICAL CHARACTER TONIGHT AS SHE CONTINUES RAPIDLY NORTHEASTWARD.

REPEATING THE 6 AM EDT POSITION...42 NORTH...56 WEST.

THE NEXT ADVISORY WILL BE ISSUED BY THE NATIONAL HURRICANE CENTER AT NOON EDT.

PELISSIER

ADVISORY NO. 25 12 NOON EDT FRIDAY, AUGUST 22, 1969

...KILLER CAMILLE LOSES IDENTITY...

SATELLITE PICTURES AND SHIP REPORTS DURING THE MORNING SHOW THAT CAMILLE HAS MERGED WITH A FRONTAL SYSTEM LOSING ALL IDENTITY AS A TROPICAL STORM. AT NOON EDT...1600Z...THE REMAINS OF CAMILLE WAS ESTIMATED TO BE NEAR LATITUDE 44.0 NORTH...LONGITUDE 52.0 WEST ...OR ABOUT 175 MILES SOUTHEAST OF CAPE RACE NEWFOUNDLAND MOVING NORTHEASTWARD AT 35 MPH OR MORE.

HIGHEST WINDS ARE NO MORE THAN 45 MPH AND ARE EXPECTED TO CONTINUE TO DIMINISH.

REPEATING THE NOON EDT POSITION...44.0 NORTH...52.0 WEST.

THIS WILL BE THE LAST ADVISORY ISSUED ON CAMILLE.

CLARK