

HURRICANE FREDERIC TIDAL FLOODS OF SEPTEMBER 12-13, 1979, ALONG THE GULF COAST, ORIOLE BEACH, GARCON POINT, HOLLEY, SOUTH OF HOLLEY, AND NAVARRE QUADRANGLES, FLORIDA

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1980

Introduction—The approximate areas flooded by Hurricane Frederic's tides of September 12-13, 1979, along coastal areas of Alabama, Florida, and Mississippi are shown in a series of hydrologic atlases. The atlases (fig. 1) are listed below. The area covered by the atlases extends from about 8 miles west of Fort Walton Beach, Fla., westward along the Gulf Coast through Alabama to Moss Point, Miss., a distance of about 115 miles. Elevations shown are related to National Geodetic Vertical Datum of 1929 (NGVD).

The Orleto Beach Garcon Point Holley South of Holley Navarre map shows the areas flooded along the shores of Santa Rosa Sound and the Gulf of Mexico from Pensacola Beach eastward to the Narrows near Fort Walton Beach, Fla. The areas flooded along the shores of Pensacola, Escambia, Bakerwater and East Bays were not delineated; however, floodwater elevations were determined. Still water elevations ranged from about 5 feet above National Geodetic Vertical Datum in sheltered areas to about 7.5 feet in areas subject to wind setup.

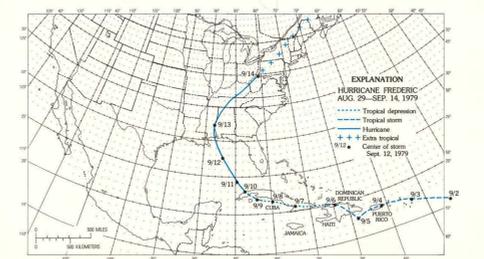


FIGURE 2—The track of Hurricane Frederic, September 2-14, 1979 (from track of Hurricane Frederic, August 29 to September 14, 1979, furnished by National Weather Service).

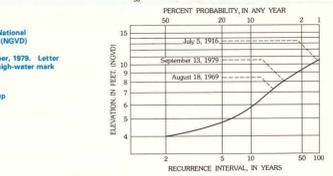


FIGURE 4—Frequency of high tides at Mobile Bay (Mobile River at Alabama State Docks).

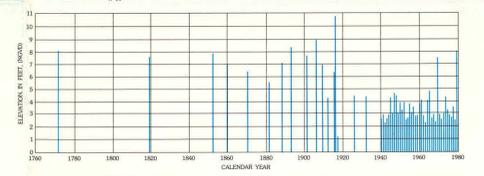


FIGURE 3—Known annual maximum tides at Mobile, Alabama, 1772-1979 (Gage at Alabama State Docks).

MISSISSIPPI

Grand Bay SW	HA-621
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ALABAMA

Grand Bay	HA-622
Chickasaw	623
Mobile	624
Hollingers Island-Thachoud	625
Colton-Baldwin	626
Heron Bay, Little Dauphin Island, Fort Morgan, and Fort Morgan NW	627
Bay Minette NW, Bay Minette NE, and Coclea NE	628
Hurricane	629
Bighead	630
Daphne Point Clear	631
Wade Bay NE	632
Weeks Bay SE	633
St. Andrews Bay NE, St. Andrews Bay NW, and Fort Morgan	634
Foley SW	635
Foley SE	636
Elbert	637

FLORIDA

Florida Bay	HA-638
West Pensacola	639
Caul Bayou Fort Benbow	640
Orleto Beach, Garcon Point, Holley, South of Holley, and Navarre	641

International system of units (S.I.)—Most units of measurement used in this atlas are inch-pound units. The following factors may be used to convert inch-pound units to Standard International (S.I.) units:

Multiply inch-pound units by:	To obtain S.I. units:
1/16 inch	2.54 centimeter (cm)
1/8 inch	3.18 centimeter (cm)
1/4 inch	6.35 centimeter (cm)
1/2 inch	12.70 centimeter (cm)
3/4 inch	19.05 centimeter (cm)
1 inch	25.40 centimeter (cm)
1 foot	30.48 centimeter (cm)
1 mile	1.609 kilometer (km)
1 nautical mile	1.852 kilometer (km)
1 knot	1.852 meter per second (m/s)
1 mile per hour (mph)	1.609 kilometer per hour (km/h)
1 millibar	1 hectopascal (hPa)

Tide records—Records of storm tides along the Gulf Coast have been documented since 1772 at Mobile, Ala., by the Corps of Engineers and others, and continuous tide records have been compiled by the Corps of Engineers since 1940. A tide gage is located at the Alabama State Docks, Mobile, Ala. Elevations of the annual maximum tides at this gage are shown in figure 3. Significant tide elevations at various points along the Gulf Coast for more than 20 hurricanes since 1893 have been recorded by the Corps of Engineers, the Geological Survey, and others. Data pertaining to some of the highest tides recorded are shown in table 1. Additional data for Hurricane Camille (1969) tides are shown on some of the maps.

National information—Other information pertaining to flooding along the Gulf Coast may be obtained at the district offices of the U.S. Geological Survey, Tallahassee, Fla., and Jacksonville, Fla., and at the U.S. Army Corps of Engineers, Mobile District, Mobile, Ala., and the U.S. Army Corps of Engineers, Gulf District, Gulfport, Miss. Descriptions of tidal characteristics, tide records, and tidal data may be obtained from the following published reports: Hanks, D.L., and Landrum, W.C., 1957, Annual tide gage and tide page records for the Atlantic and Gulf Coasts of the United States, U.S. Department of Commerce, Weather Bureau, National Hurricane Research Project, report 7.

Whom, K.L., and Hudson, L.W., 1969, Hurricane Camille tidal flood of August 1969 along the Gulf Coast, U.S. Geological Survey Hydrologic Investigations Atlas (series of quadrangles), Mississippi, HA-395 Logtown, HA-402 Pass Christian, HA-396 English Lookout, HA-403 Gulfport North-South, HA-397 La-Mesa, HA-404 Biloxi, HA-398 Waveland-Grand Island, HA-405 Ocean Springs-Deer Island, HA-399 Vidalia, HA-406 PascAGOULA, (Scale 1:62,500).

HA-400 Bay St. Louis, HA-407 Fort-Cadwallader Bay SW, Miss., Ala.

HA-401 Gulfport NW, U.S. Department of the Army, Corps of Engineers, Mobile District, 1965, Report on Hurricane survey of Mississippi Coast, 49 p.

1965, Report on Hurricane survey of Northwest Florida, 49 p.

1965, Report on Hurricane survey of the Alabama Gulf Coast, 40 p.

1967, Hurricane Betty, 8-11 September 1965, 65 p.

1970, Hurricane Camille, 14-22 August 1969, 80 p.

1976, Hurricane Edou, 16-22 September 1975, 89 p.

Storm-tide frequency—Frequency of high storm tides in Mobile Bay was derived from an statistical evaluation of the tide records of the gage at Mobile, Ala. The frequency, expressed as the relation of recurrence interval to elevation of high tide at the Mobile gage, is shown in figure 4. The recurrence interval is inversely related to the percent probability of an event being equalled or exceeded in any one year. The percent probability of high-tide elevations at the Mobile gage is also indicated. At the Mobile gage, Hurricane Frederic's maximum tide estimated to have a recurrence interval of about 25 to 30 years; that is, it may be equalled or exceeded on the average of about 40 times in a 1000-year period. The maximum tide at Biloxi, Miss., during Hurricane Camille (1969) was estimated to have a recurrence interval of about 170 years.

Because Mobile Bay is a shallow bay, as you move into the bays and estuaries, the frequency data at the Mobile gage are applicable only at the gage site and at nearby points.

Water-surface elevations—Water-surface elevations of maximum tides of Hurricane Frederic varied from place to place, especially along beach fronts. High-water marks for Hurricane Frederic are identified on atlases as "tracks" or "outside." Marks found within a building or structure are labeled "inside." Some found

outside of any enclosure are identified as "outside." Where two or more outside marks are shown at one location, the lower marks are considered to be the prevailing high tide; the higher marks are maximum wave height or surge. The maximum documented wave height shows the prevailing tide for Hurricane Frederic is about 7 feet. Where the elevation of several high-water marks at a location varied slightly, the average elevation of the marks is shown.

Errors of flooding—Approximate flood boundaries of Hurricane Frederic are delineated on U.S. Geological Survey topographic maps. Difficulties along rivers, roads, dunes, and other localities were used to define the boundaries.

Depth of flooding—The depth of flooding at any point can be estimated by subtracting the ground-surface elevation from the water-surface elevation determined by interpolating between the maximum tide elevations shown on the map. Approximate ground elevations can be estimated from contours on the map, although more accurate elevations can be obtained by leveling to bench marks. The elevation of contour lines on some maps are in meters. Elevations of high-water marks shown on these maps are given both in meters and in feet.

Emergency water supplies—Some water wells identified by the Alabama Health Department, Division of Public Water Supplies, or other approved or potential emergency water supplies, are shown on the map.

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Acknowledgments—We gratefully acknowledge the cooperation of the National Weather Service, National Oceanic and Atmospheric Administration, the U.S. Army Corps of Engineers, the U.S. Air Force, the U.S. Coast Guard, the Alabama Health Department, Division of Public Water Supplies, The American Red Cross, and others who furnished information.