

Base from U.S. Geological Survey
Gulf Breeze 1959 and
Fort Barrancas 1971
Orlando Beach 1969.

Introduction.—The approximate areas flooded by Hurricane Frederic 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. The Gulf Breeze-Fort Barrancas map shows the areas flooded along the shores of Big Lagoon, Pensacola Bay, Santa Rosa Sound and the

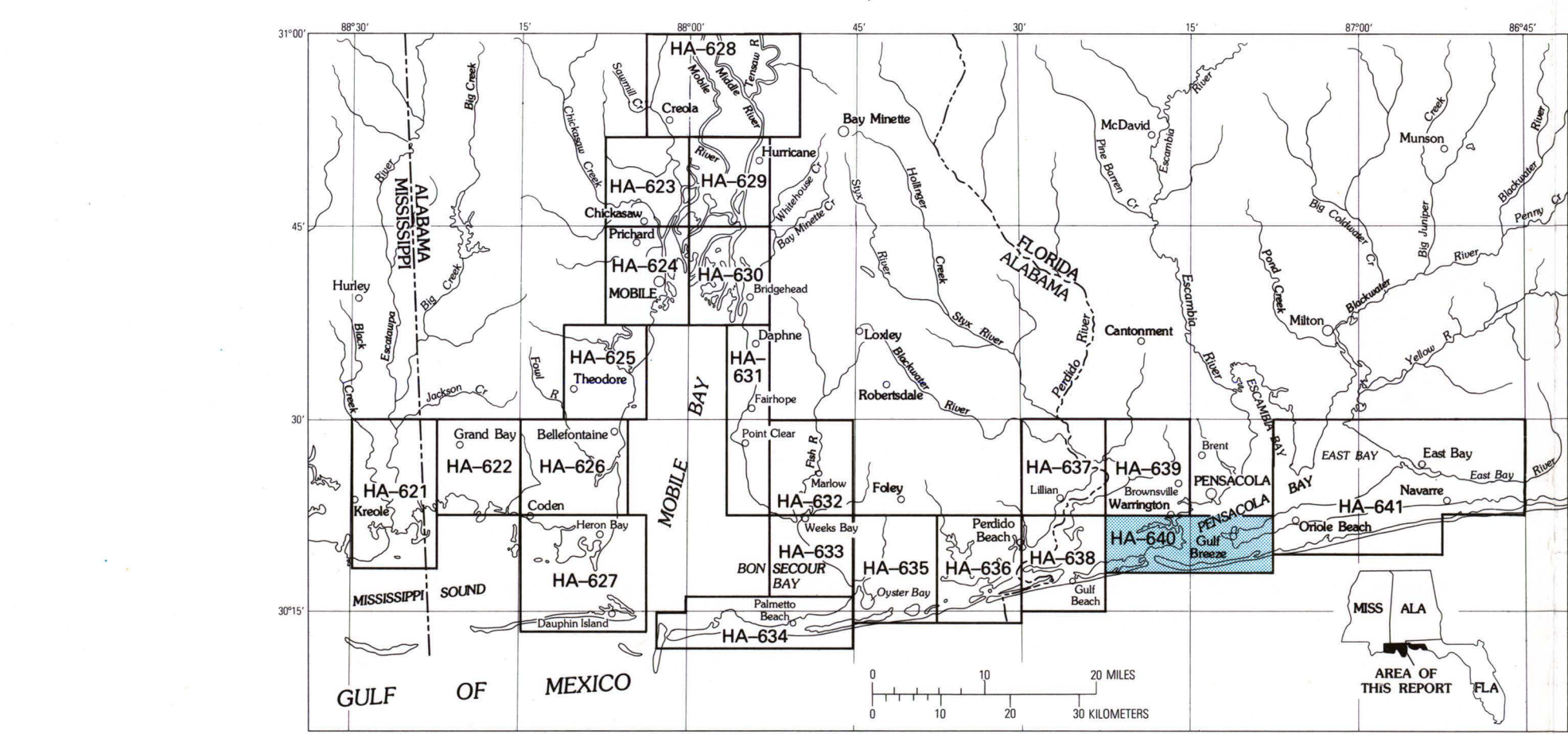


FIGURE 1—Index map of the Mississippi, Alabama, and Florida gulf coast showing location of quadrangles for which flood boundaries of Hurricane Frederic are delineated.

MISSISSIPPI		ALABAMA (Cont.)	
Kreole-Grand Bay SW	HA-621	Weeks Bay NE	HA-632
Grand Bay	HA-622	Weeks Bay SE	633
Chickasaw	623	St. Andrews Bay NW, and Fort Morgan	634
Mobile	624	Foley SW	635
Hollings Island-Theodore	625	Foley SE	636
Coden-Bellefontaine	626	Lillian	637
Heron Bay, Little Dauphin Island, Fort Morgan, and Fort Morgan NW	627	Perdido Bay	HA-638
Bay Minette NW, Bay Minette NE, and Grede NE	628	West Pensacola	639
Hurricane	629	Gulf Breeze-Fort Barrancas	640
Bridgehead	630	Orlando Beach, Garcon Point, Holley, South of Holley, and Navarre	641
Dauphin-Point Clear	631		

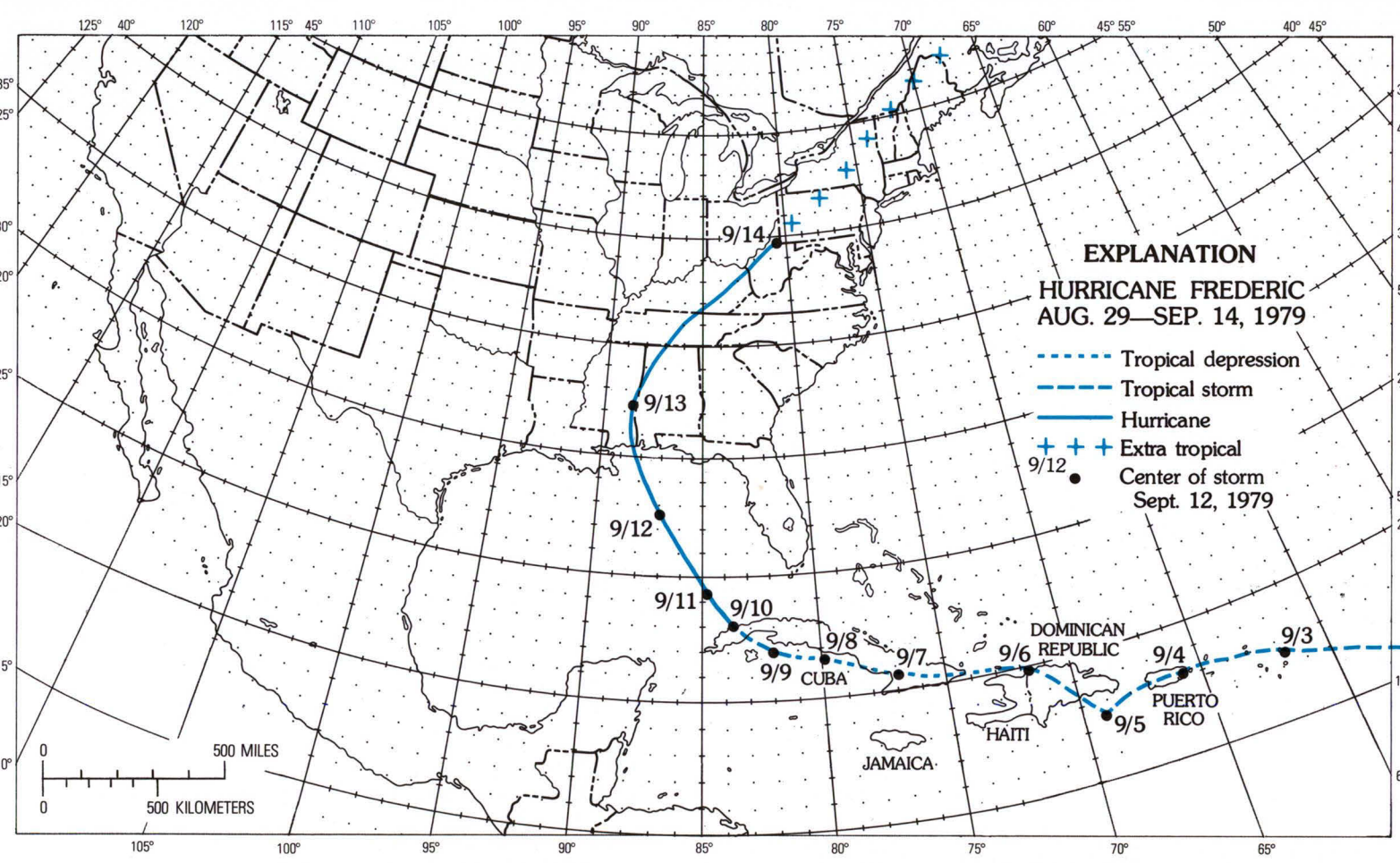


FIGURE 2—The track of Hurricane Frederic, September 2–14, 1979 (from track of Hurricane Frederic, August 29 to September 14, 1979, furnished by National Weather Service).

Hurricane Frederic was one of the most intense hurricanes of record to enter the United States mainland. A National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA) research aircraft reported a flight-level wind of 138 knots (about 160 miles per hour) a short time prior to landfall. A wind velocity gauge maintained by the NWS near Dauphin Island, Ala., recorded a maximum wind speed of about 126 knots (145 miles per hour). Lowest central pressure recorded, 943 millibars (about 27.8 inches of mercury), was that reported aboard an Air Force Reconnaissance aircraft, unofficial central pressure reported at Grand Bay, Ala., was 931 millibars (about 27.5 inches of mercury). The maximum recorded precipitation along the coast during the passage of the hurricane was about 8.5 inches at Dauphin Island, Ala. A map of the storm track furnished by NWS is shown below. (See fig. 2.)

Flooding and water-related damages were most severe at Dauphin Island and Gulf Shores, Ala. However, significant flooding and damage occurred as far east as Pensacola Beach, Fla., and as far west as Moss Point, Miss. Maximum prevailing flood elevations were about 9.7 ft at Dauphin Island, Ala., about 10.3 ft at the U.S. Highway 98 Causeway across Mobile Bay, Ala., and about 14.3 ft at Gulf Shores, Ala.

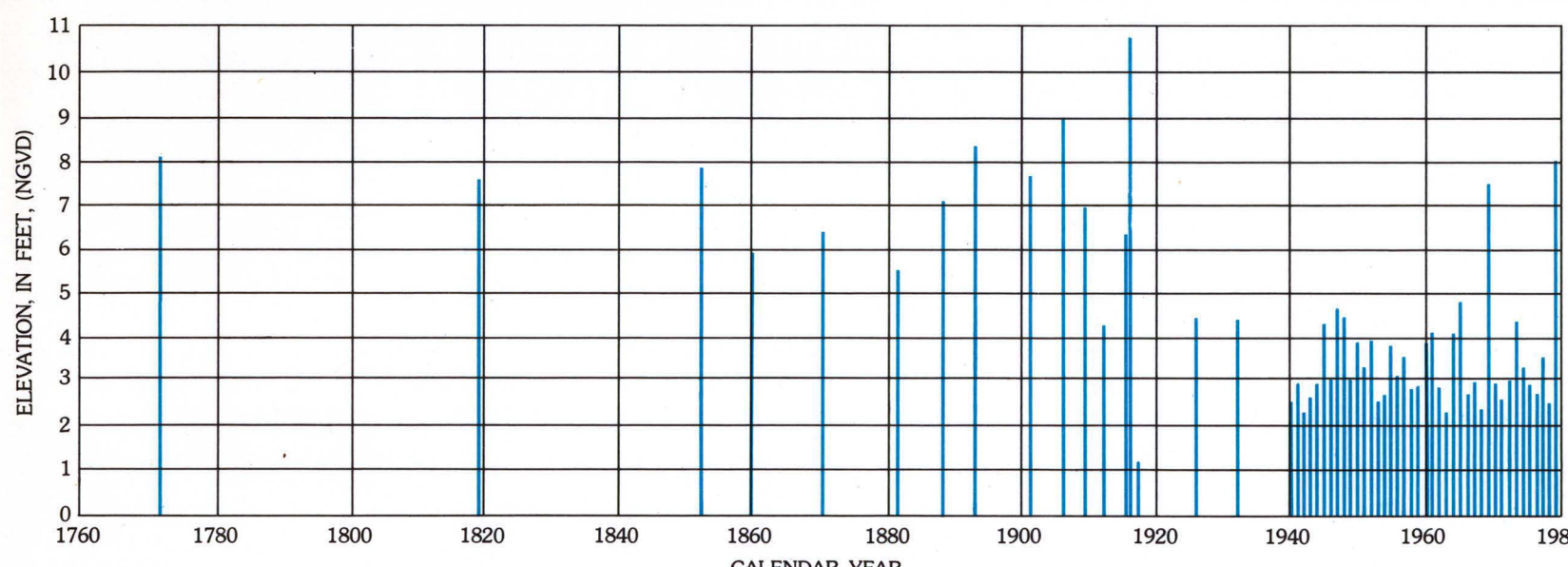


FIGURE 3—Known annual maximum tides at Mobile, Alabama, 1772–1979 (Gage at Alabama State Docks).

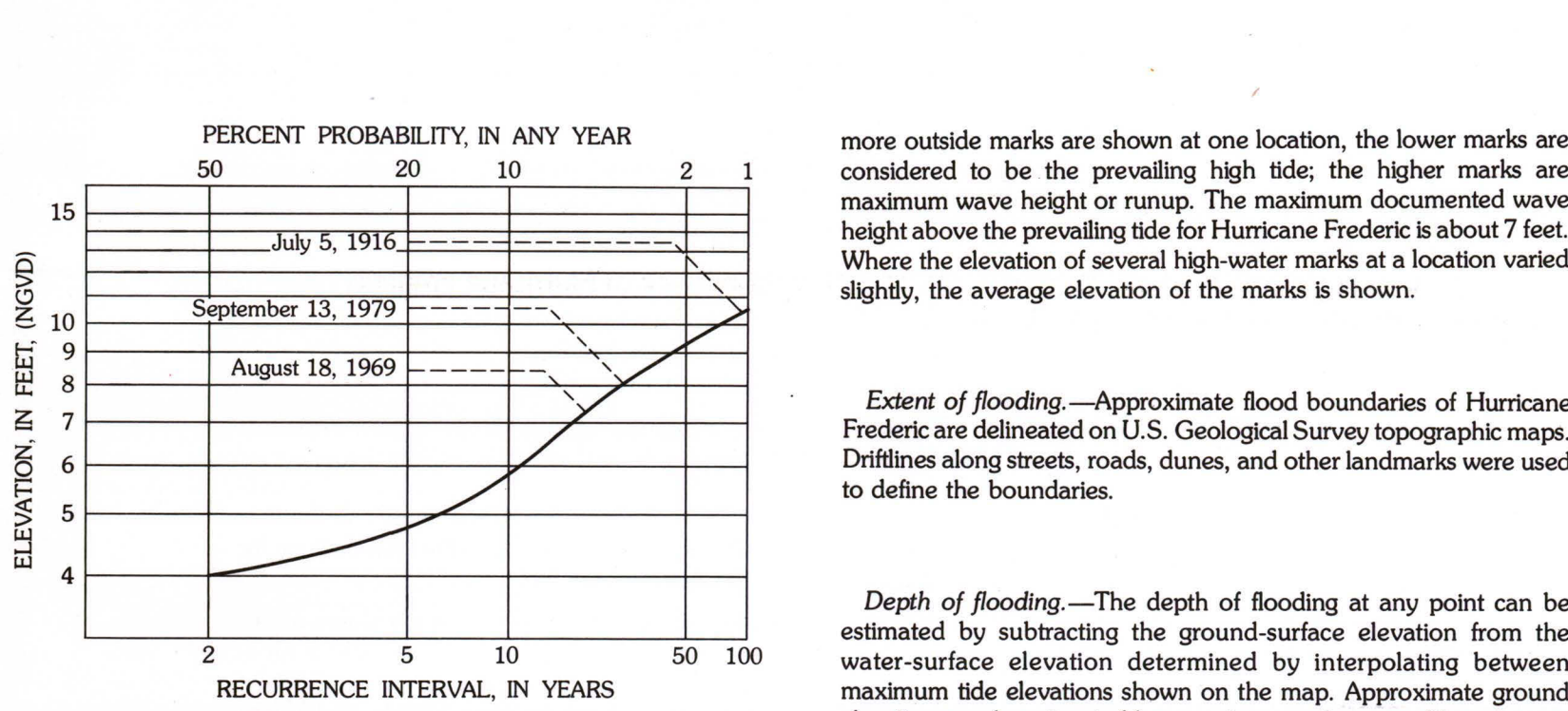


FIGURE 4—Frequency of high tides at Mobile gage (Mobile River at Alabama State Docks).

Variations in maximum tide 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 "inside" or "outside." Marks found within a building or structure are labeled "inside;" those located 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 runup. The maximum documented wave height above 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.

Extent of flooding.—Approximate flood boundaries of Hurricane Frederic are delineated on U.S. Geological Survey topographic maps. Driftlines along streets, roads, dunes, and other landmarks 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 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 elevations 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, as either approved or potential emergency water supplies, are shown on the map.

TABLE 1—Hurricane tide elevations at selected locations along the Gulf of Mexico coast, 1772–1979; in feet above National Geodetic Vertical Datum of 1929	
Date	Mobile Bay, Ala. Gulf Shores, Ala. Pensacola, Fla.
September 4, 1772	8.2
August 23, 1852	8.0
October 2, 1893	8.4
September 27, 1906	9.1
July 5, 1916	10.8
August 18, 1969	11.2
September 13, 1979	5.9

Note: Records furnished by U.S. Army Corps of Engineers, Mobile District.

Storm-tide frequency.—Frequency of high storm tides in Mobile Bay was derived from a 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 year. The percent probability of high-tide elevations at the Mobile gage is also indicated. At the Mobile gage, Hurricane Frederic's maximum tide was 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 thousand-year period. The maximum tide at Biloxi, Miss., during Hurricane Camille (1969) was estimated to have a recurrence interval of about 170 years.

Because tidal waves dissipate as they move into the bays and estuaries, the frequency data at the Mobile gage are applicable only at the gage site and at nearby points.

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 of record are shown on table 1. Additional data for Hurricane Camille (1969) tides are shown on some of the maps.

HURRICANE FREDERIC TIDAL FLOODS OF SEPTEMBER 12–13, 1979, ALONG THE GULF COAST, GULF BREEZE-FORT BARRANCAS QUADRANGLES, FLORIDA

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