HURRICANE ISAAC IN LOUISIANA

E High Water Marks

High water mark (HWM) data for Hurricane Isaac was provided to the Mitigation Assessment Team (MAT) by the U.S. Geological Survey (USGS). However, all of the data points provided are located outside of the area protected by the Hurricane and Storm Damage Risk Reduction System (HSDRRS), so the team was unable to compare many of the HWMs to previous HWMs observed during Hurricane Katrina. Many of the affected areas during Hurricane Katrina were within the HSDRRS. To better understand the flood depths observed in the field, these data were compared to the effective base flood elevation (BFE), the post-Katrina Advisory Base Flood Elevation (ABFE), and the preliminary BFE (as applicable) in the New Orleans areas affected by Hurricane Isaac. Figure E-1 shows the locations of the HWMs used for this analysis.

Table E-1 provides the comparison of elevations for the data points shown in Figure E-1. Most points located within the 100-year flood zone have HWM elevations that are lower than the effective, advisory, and preliminary BFEs for the location, indicating that Hurricane Isaac was below a design flood event. Some areas within the 500-year floodplain (Zone X shaded) did experience flooding during Hurricane Isaac. The HWMs for these areas mostly fall in St. John the Baptist Parish, which adopted preliminary maps in 2010. The highlighted rows in Table E-1 represent locations where the HWM elevation was higher than the effective BFE. All elevations in the table are referenced to the North American Vertical Datum of 1988 (NAVD 88).

Although the USGS points all lie outside of the HSDRRS, the U.S. Army Corps of Engineers found that the HSDRRS did generally perform as expected. With the HSDRRS in place, the levees and floodwalls were not overtopped. The limited extent of damage within the HSDRRS system also supports this determination.

Figure E-1: Locations of USGS HWMs used in the MAT analysis.

Table E-1: Elevations and Flood Zones for HWM Locations (elevations referenced to NAVD 88)

HWM ID	Latitude	Longitude	HWM Elevation	Effective Zone (BFE, feet)	ABFE Zone (BFE, feet)	Preliminary Zone (BFE, feet)	Parish
HWM-LA-JEF-005	29.75909	-90.10209	4.35	AE (EL 7)	AE 8	AE (EL 8)	Jefferson
HWM-LA-JEF-004	29.73223	-90.12875	3.93	AE (EL 8)	AE 9	AE (EL 8)	Jefferson
HWM-LA-JEF-001	29.68025	-90.10141	5.09	AE (EL 9)	VE 10	VE (EL 11)	Jefferson
HWM-LA-JEF-002	29.66820	-90.10934	4.92	VE (EL 11)	VE 10	VE (EL 11)	Jefferson
HWM-LA-JEF-003	29.73444	-90.12459	3.50	AE (EL 7)	AE 9	AE (EL 8)	Jefferson
HWM-LA-ORL-004	30.12564	-89.86719	5.19	V16 (EL 15)	VE 16	VE (EL 14)	Orleans
HWM-LA-ORL-003	30.14968	-89.74074	9.77	V19 (EL 15)	VE 16	VE (EL 16)	Orleans
HWM-LA-ORL-028	30.14508	-89.74825	6.09	V16 (EL 15)	VE 16	VE (EL 15)	Orleans
HWM-LA-ORL-001	30.07725	-89.84861	6.87	V16 (EL 13)	VE 14	VE (EL 15)	Orleans
HWM-LA-ORL-029	30.12434	-89.86669	5.87	V16 (EL 15)	VE 16	VE (EL 14)	Orleans
HWM-LA-ORL-002	30.06708	-89.83292	8.61	A14 (EL 13)	AE 14	VE (EL 14)	Orleans
HWM-LA-ORL-005	30.06643	-89.80586	9.74	A14 (EL 12)	AE 13	VE (EL 16)	Orleans
HWM-LA-ORL-017	30.6688	-89.80633	9.74	A14 (EL 12)	AE 13	VE (EL 16)	Orleans
HWM-LA-PLA-202	29.51200	-89.76480	7.97	A16 (EL 11)	AE 12	AE (EL 12)	Plaquemines
HWM-LA-PLA-010	29.25280	-89.35805	6.33	V21 (EL 15)	VE 16	VE (EL 12)	Plaquemines
HWM-LA-PLA-205	29.59507	-89.84190	7.80	A13 (EL 5)	AE 10	VE (EL 15)	Plaquemines
HWM-LA-PLA-201	29.76060	-90.01770	14.25	B	AE 18	VE (EL 21)	Plaquemines
HWM-LA-PLA-204	29.55910	-89.88480	7.10	A16 (EL 9)	N/A	AE (EL 11)	Plaquemines
HWM-LA-STB-001	29.84669	-89.76403	11.33	A15 (EL 13)	AE 16	AE (EL 17)	St. Bernard
HWM-LA-STB-004	29.81886	-89.61126	9.40	A15 (EL 14)	N/A	VE (EL 18)	St. Bernard
HWM-LA-STJ-006	30.08688	-90.44575	7.18	AE (EL 9)	A 12	AE (EL 9)	St. John the Baptist
HWM-LA-STJ-007	30.08590	-90.44424	5.75	AE (EL 9)	A 12	AE (EL 9)	St. John the Baptist
HWM-LA-STJ-005	30.08213	-90.46706	7.41	AE (EL 8)	N/A	AE (EL 8)	St. John the Baptist
HWM-LA-STJ-210	30.06922	-90.45872	7.71	AE (EL 8)	N/A	AE (EL 8)	St. John the Baptist
HWM-LA-STJ-001	30.08883	-90.50602	5.52	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-002	30.08830	-90.50597	5.08	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-003	30.08327	-90.51130	5.45	Shaded X	N/A	N/A	St. John the Baptist

Table E-1: Elevations and Flood Zones for HWM Locations (elevations referenced to NAVD 88) (concluded)

HWM ID	Latitude	Longitude	HWM Elevation	Effective Zone (BFE, feet)	ABFE Zone (BFE, feet)	Preliminary Zone (BFE, feet)	Parish
HWM-LA-STJ-004	30.07714	-90.54957	5.60	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-200	30.07794	-90.57258	3.63	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-201	30.07639	-90.57231	4.89	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-202	30.07594	-90.59753	5.41	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-203	30.05756	-90.62594	6.45	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-204	30.05778	-90.63572	6.53	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-205	30.08775	-90.48217	6.00	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-206	30.08469	-90.48700	6.96	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-209	30.08131	-90.52483	5.56	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-211	30.05664	-90.46103	8.39	Shaded X	N/A	N/A	St. John the Baptist
HWM-LA-STJ-207	30.09450	-90.48853	6.44	AE (EL 6)	N/A	AE (EL 6)	St. John the Baptist
HWM-LA-STJ-208	30.09536	-90.49397	6.18	AE (EL 6)	N/A	AE (EL 6)	St. John the Baptist

HWM = high water mark

BFE = base flood elevation

ABFE = Advisory Base Flood Elevation

N/A = Not applicable

Note: Highlighted rows represent locations where the HWM elevation was higher than the effective BFE.