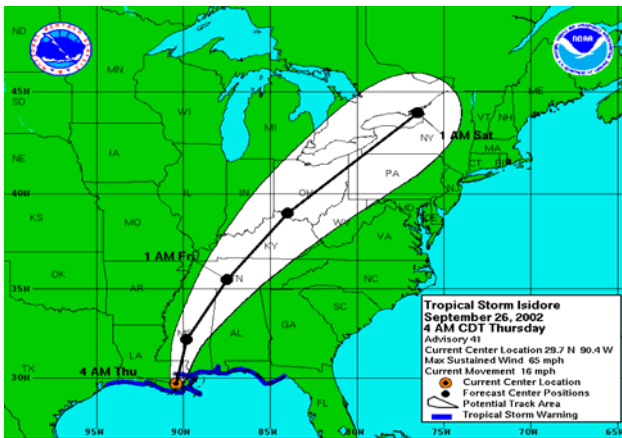



A REPORT ON THE EFFECTS OF TROPICAL STORM ISIDORE ON WATER LEVELS ALONG THE GULF COAST



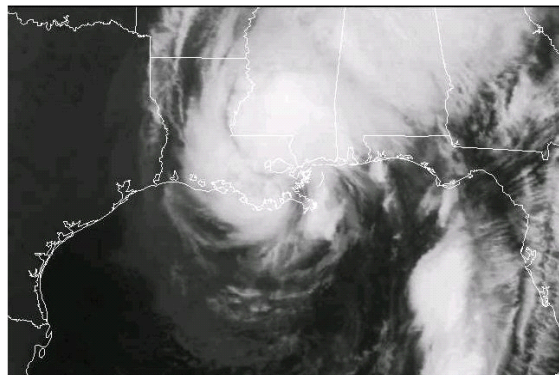
TIDES ONLINE
<http://tidesonline.nos.noaa.gov>
<http://www.co-ops.nos.noaa.gov>

**National Ocean Service
CO-OPS
Center for Operational Oceanographic
Products and Services**

 NOAA National Ocean Service Center for Operational Oceanographic Products and Services

Updated: 11:45 AM UTC on September 26, 2002

Tides Online



CO-OPS Tide Gauge Data for Tropical Storm Isidore

NOAA's Center for Operational Oceanographic Products And Services (CO-OPS) maintains a network of tide gauges along the Gulf Coast from Brownsville, TX eastward to Key West, FL. During the hurricane season (June through November) CO-OPS personnel actively maintain and monitor these gauges which provide useful information about water levels along the Gulf Coast during storm events. Presently there are 38 gauges in the Gulf Coast region of which 25 recorded valuable data during the recent passing of Tropical Storm Isidore. Nine of the Gulf Coast Florida gauges were of sufficient distance from the storms center that water level data from those locations is not included in this report. The other five stations all recorded data during the storm. Both of the Alabama gauges recorded data during the storm, however, for a brief period from 14:00 to 16:30 on 09/26/02 the Mobile station appeared to become inundated and data for this period is unreliable. The lone Mississippi gauge was not operational, however, all four Louisiana gauges functioned properly supplying water level data throughout the storm although the Lake Charles gauge is not included in this report as no datum has been calculated for this station. All sixteen of the Texas gauges functioned properly, however, datum calculations do not exist for Brownsville and it is not included. The locations of selected Gulf Coast tide stations are presented in figure 1 below.

Figure 1. Locations of select Gulf Coast Tide Stations

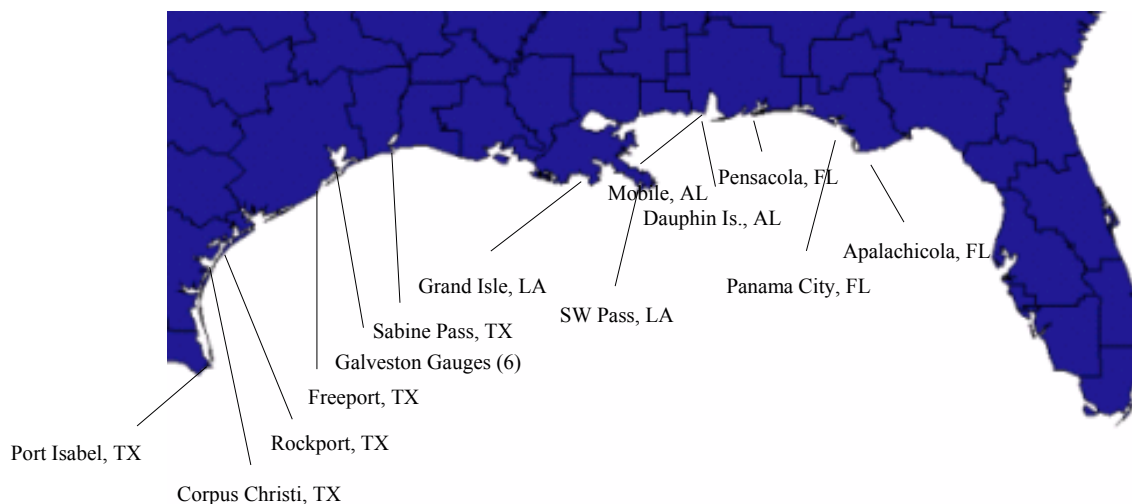


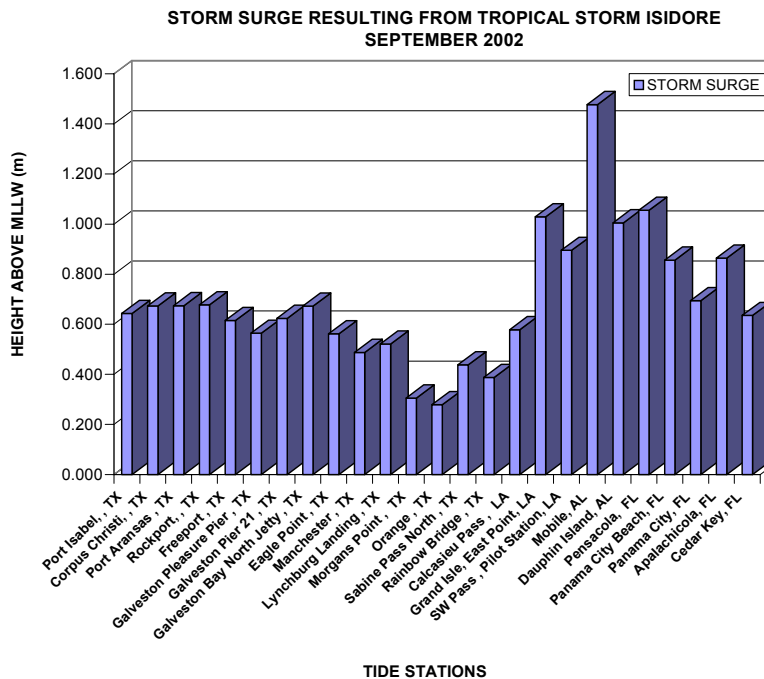
Table 1 and figure 2 below summarize the peak observed, predicted and storm surge water levels for the 25 Gulf Coast gauges included in this report. Hydrographs of individual tide stations follow figure 2.

**Table 1. Tide Gauge Data for Tropical Storm Isidore
Sept. 25-26, 2002**

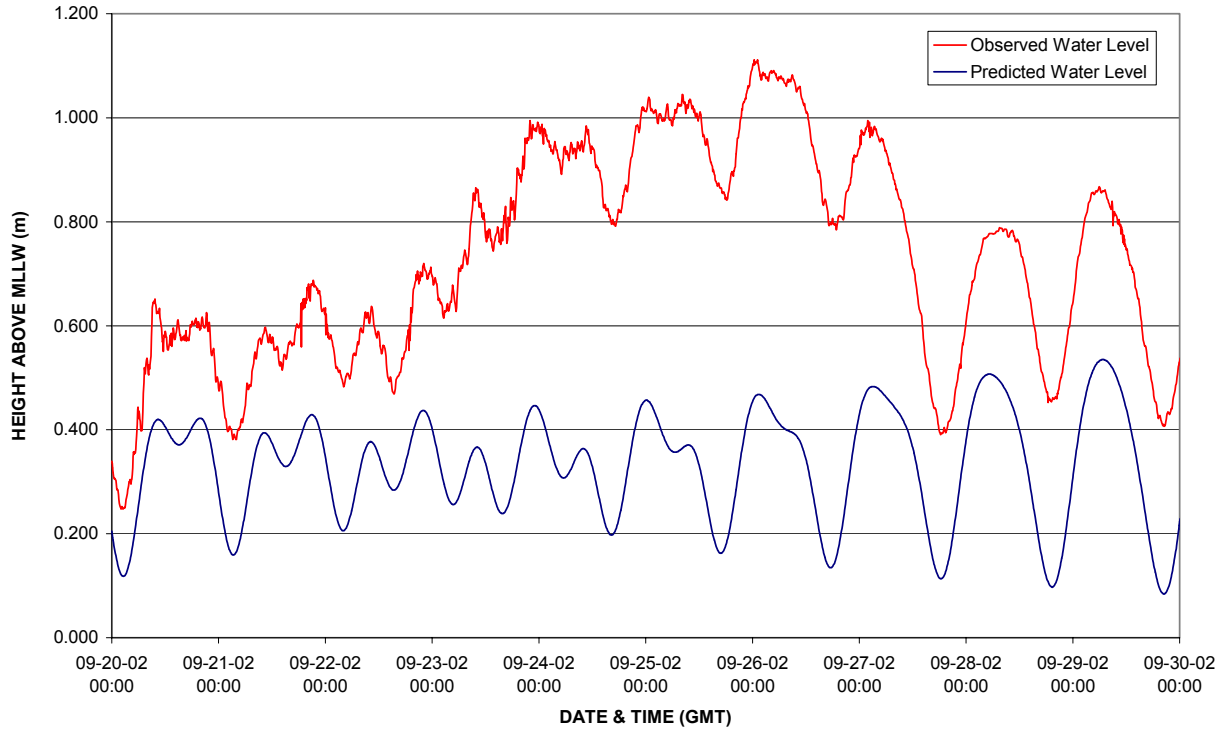
Tide Gauge Description	Station ID	Date/Time (GMT)	Elevation above MLLW (m)			Latitude	Longitude
			Observed	Predicted	Storm Surge		
Port Isabel, Laguna Madre, TX	8779770	09-26-02 01:06	1.111	0.468	0.643	26° 3.6' N	97° 12.9' W
Corpus Christi, Gulf of Mexico, TX	8775870	09-26-02 00:36	1.246	0.573	0.673	27° 34.8' N	97° 13.0' W
Port Aransas, TX	8775237	09-26-02 00:06	0.955	0.281	0.674	27° 50.3' N	97° 3.6' W
Rockport, Arkansas Bay, TX	8774770	09-26-02 08:12	0.861	0.184	0.677	28° 1.3' N	97° 2.8' W
Freeport, Dow Barge Canal, TX	8772440	09-24-02 23:36	1.166	0.551	0.615	28° 56.9' N	95° 18.5' W
Galveston Pleasure Pier, TX	8771510	09-25-02 00:36	1.208	0.644	0.564	29° 17.1' N	94° 47.3' W
Galveston Pier 21, Galveston Channel, TX	8771450	09-25-02 09:12	1.058	0.435	0.623	29° 18.6' N	94° 47.6' W
Galveston Bay Entrance, North Jetty, TX	8771341	09-25-02 09:00	1.111	0.439	0.672	29° 21.5' N	94° 43.5' W
Eagle Point, Galveston Bay, TX	8771013	09-25-02 05:30	0.990	0.428	0.562	29° 28.8' N	94° 55.1' W
Manchester, Houston Ship Channel, TX	8770777	09-25-02 05:12	0.908	0.421	0.487	29° 43.0' N	95° 16.0' W
Lynchburg Landing, San Jacinto R., TX	8770733	09-25-02 06:30	0.870	0.349	0.521	29° 45.9' N	95° 4.7' W
Morgans Point, Barbours Point, TX	8770613	09-25-02 05:24	0.848	0.543	0.305	29° 40.9' N	94° 59.1' W
Orange, Old Navy Base, TX	8770597	09-25-02 13:30	0.477	0.198	0.279	30° 5.9' N	93° 43.3' W
Sabine Pass North, TX	8770570	09-25-02 08:48	0.963	0.525	0.438	29° 43.8' N	93° 52.2' W
Rainbow Bridge, Neches R., TX	8770520	09-25-02 12:42	0.589	0.202	0.387	29° 58.8' N	93° 52.9' W
Calcasieu Pass, East Jetty, LA	8768094	09-25-02 08:00	1.042	0.464	0.578	29° 45.9' N	93° 20.6' W
Grand Isle, East Point, LA	8761724	09-26-02 04:48	1.420	0.391	1.029	29° 15.8' N	89° 57.4' W
SW Pass, Pilot Station, LA	8760943	09-26-02 04:00	1.338	0.443	0.895	28° 55.6' N	89° 25.1' W
Mobile, Mobile Channel, AL*	8737048	09-26-02 19:30	1.669	0.192	1.477	30° 42.5' N	88° 2.6' W
Dauphin Island, Mobile Bay, AL	8735180	09-26-02 10:30	1.338	0.333	1.005	30° 15.0' N	88° 4.5' W
Pensacola, Pensacola Bay, FL	8729840	09-26-02 11:00	1.375	0.32	1.055	30° 24.2' N	87° 12.7' W
Panama City Beach, FL	8729210	09-26-02 07:54	1.259	0.403	0.856	30° 12.8' N	85° 52.8' W
Panama City, ST. Andrew Bay, FL	8729108	09-26-02 09:12	1.047	0.353	0.694	30° 9.1' N	85° 40.0' W
Apalachicola, Apalachicola R., FL	8728690	09-26-02 10:36	1.433	0.569	0.864	29° 43.6' N	84° 58.9' W
Cedar Key, FL	8727520	09-26-02 20:42	1.630	0.995	0.635	29° 8.1' N	83° 1.9' W

*Gauge inundated. Peak may be between 14:06 (2.072) and 16:30 (2.071)

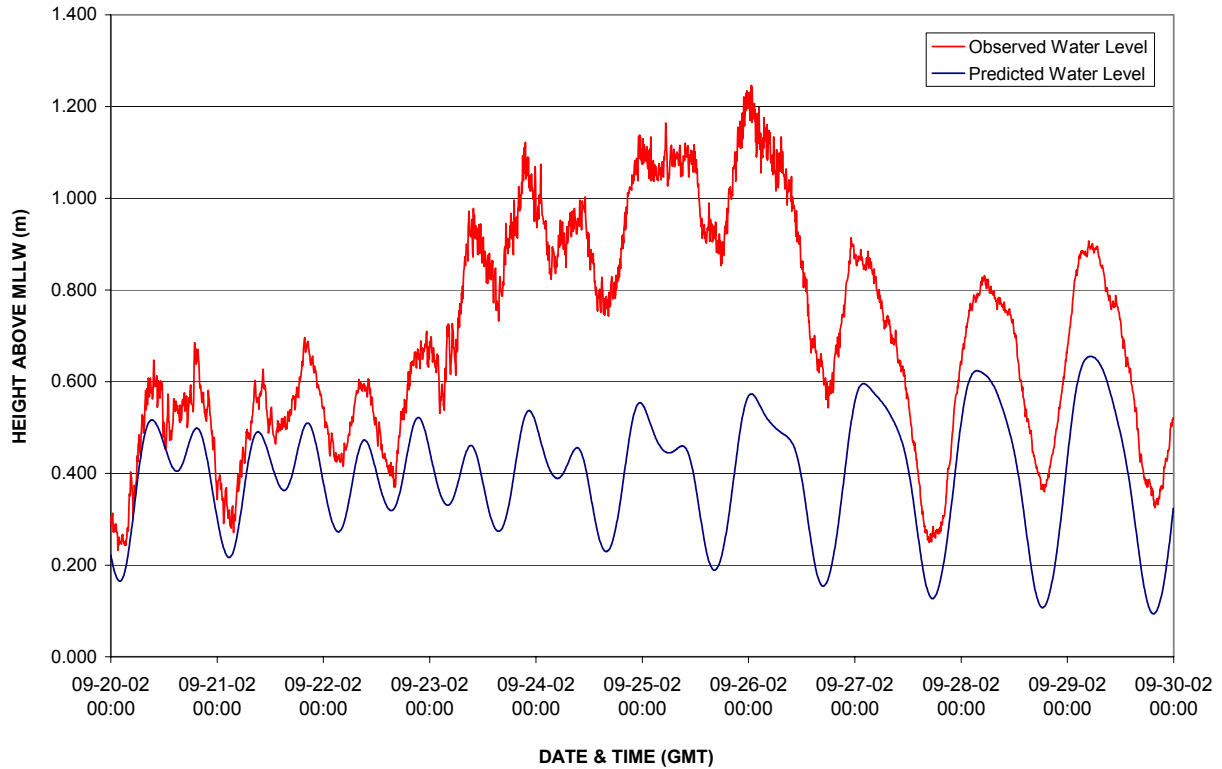
Figure 2. Maximum storm surge at water level stations during Tropical Storm Isidore, September 2002



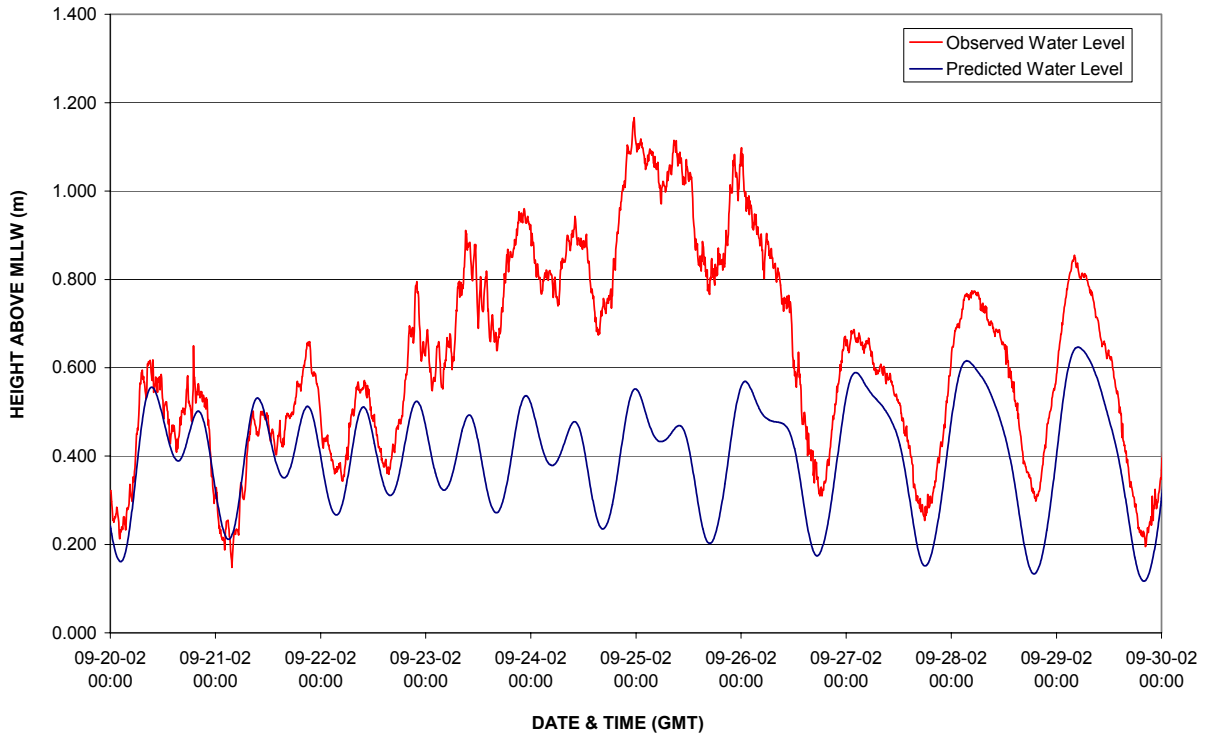
PORT ISABEL, TX - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.111 09/26/02 01:06



CORPUS CHRISTI, TX - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.246 09/26/02 00:36

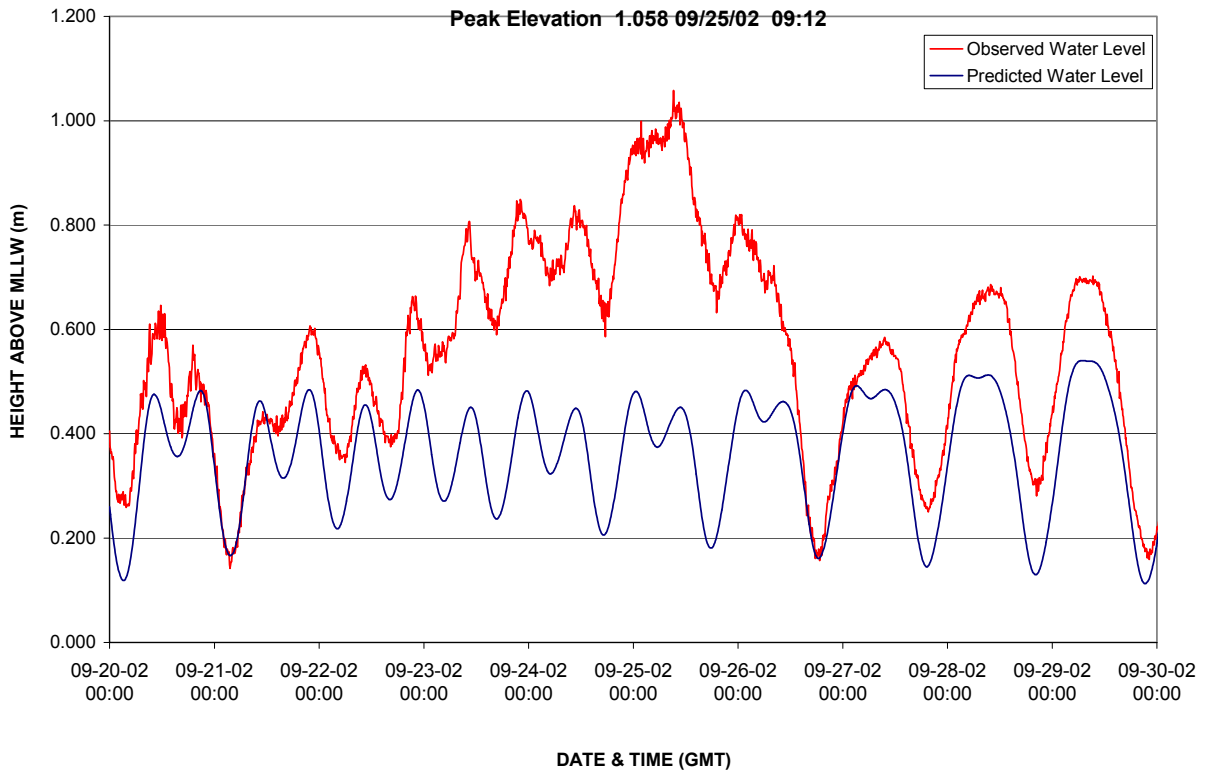


FREEPORT, DOW BARGE CANAL, TX - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.166 09/24/02 23:36



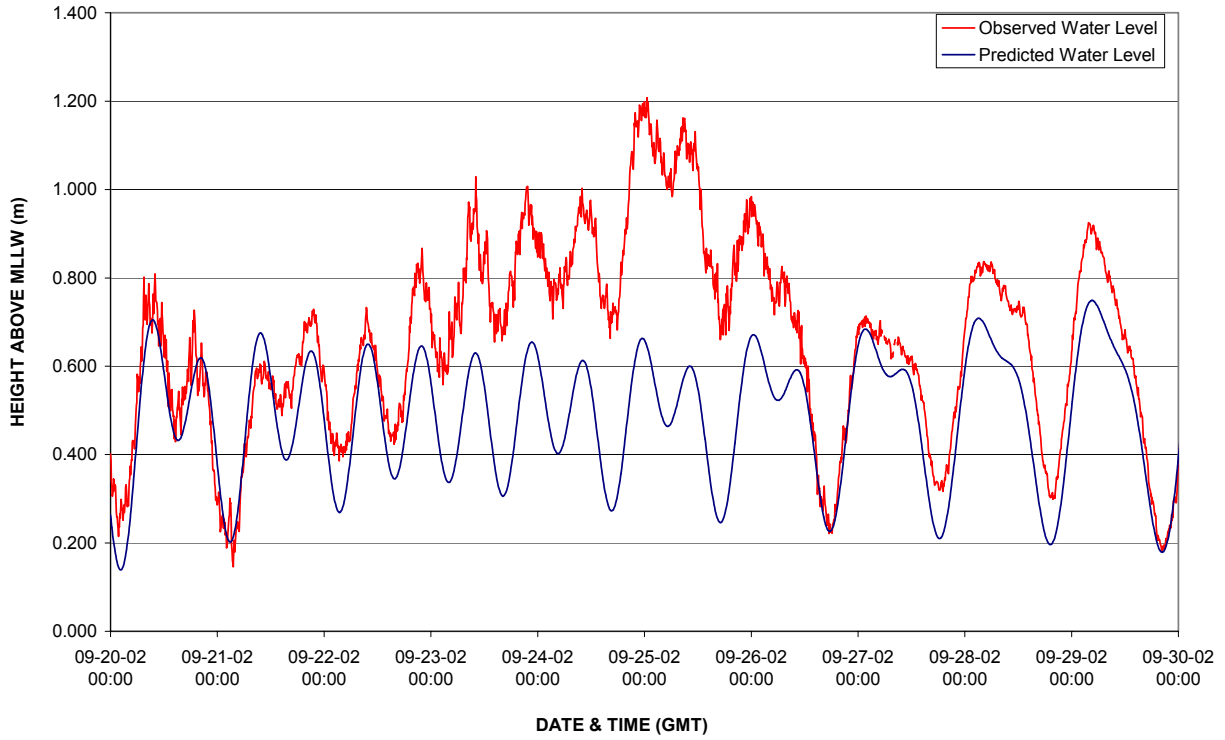
GALVESTON PIER 21, GALVESTON CHANNEL, TX - OBSERVED -vs- PREDICTED WATER LEVELS

Peak Elevation 1.058 09/25/02 09:12



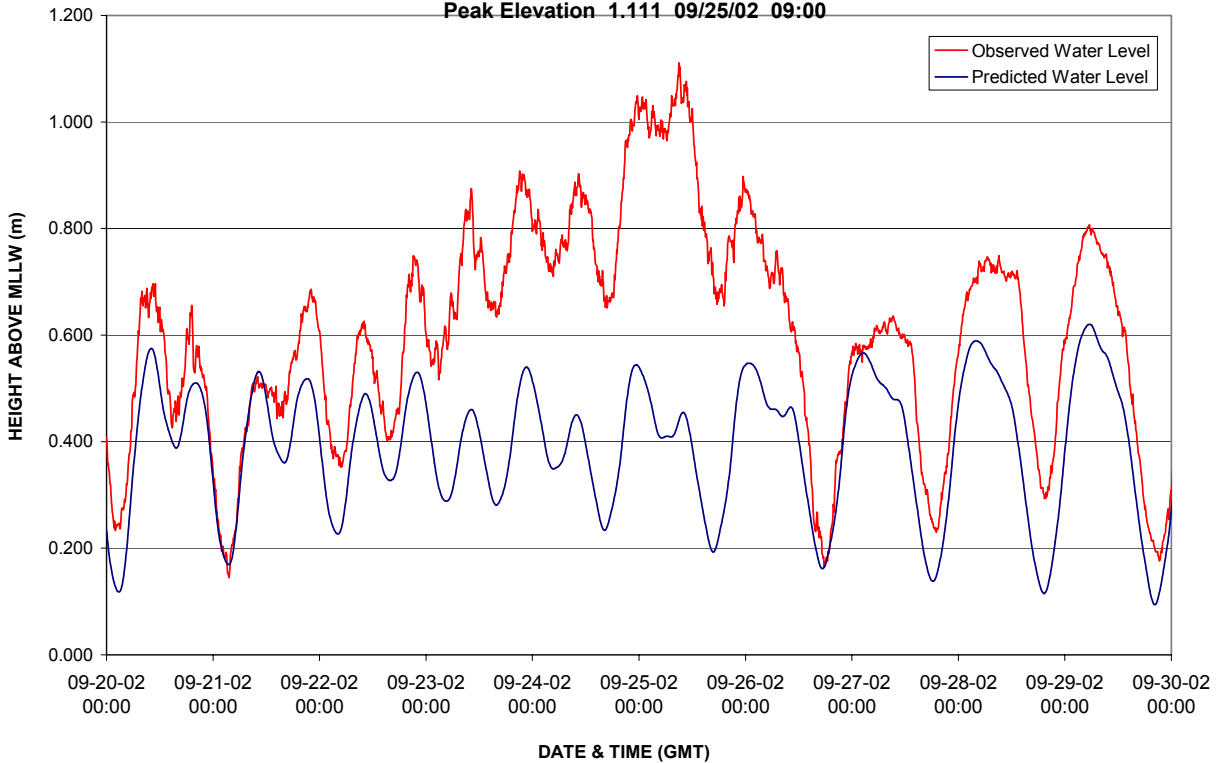
GALVESTON PLEASURE PIER, TX - OBSERVED -vs- PREDICTED WATER LEVELS

Peak Elevation 1.208 09/25/02 00:36



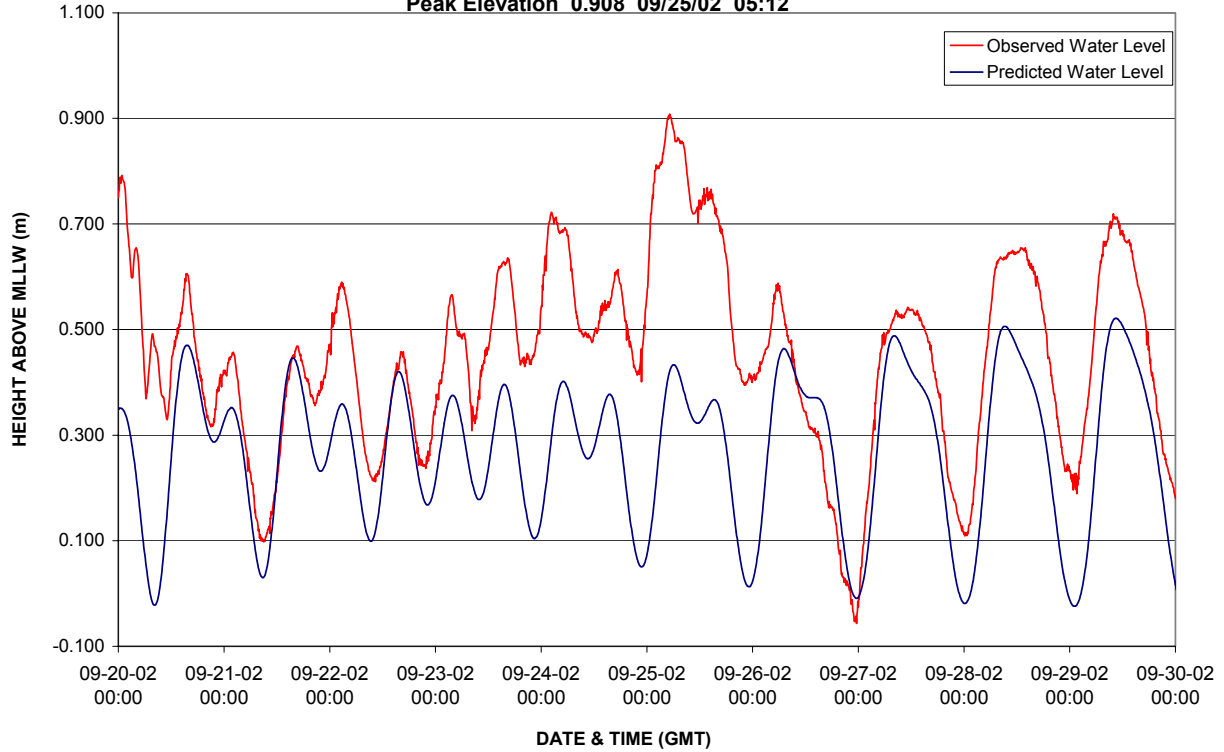
GALVESTON BAY ENTRANCE, NORTH JETTY, TX - OBSERVED -vs- PREDICTED WATER LEVELS

Peak Elevation 1.111 09/25/02 09:00



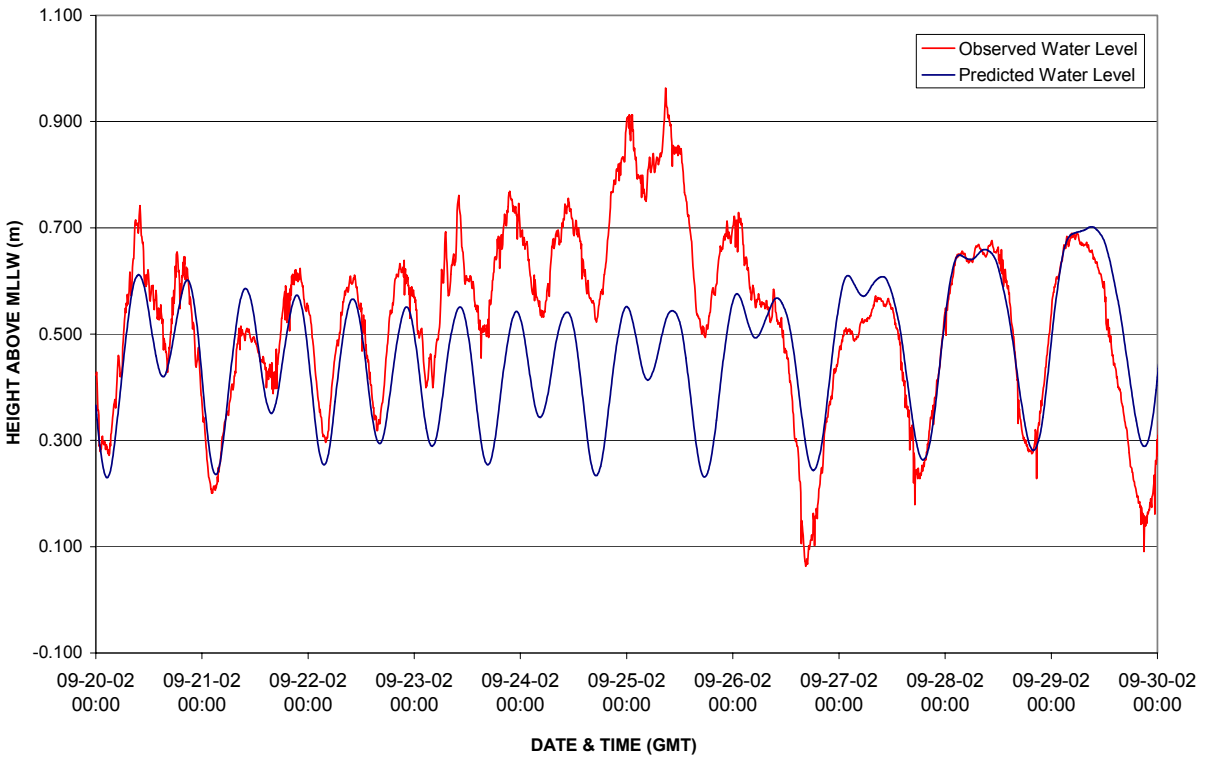
MANCHESTER, HOUSTON SHIP CHANNEL, TX - OBSERVED -vs- PREDICTED WATER LEVELS

Peak Elevation 0.908 09/25/02 05:12

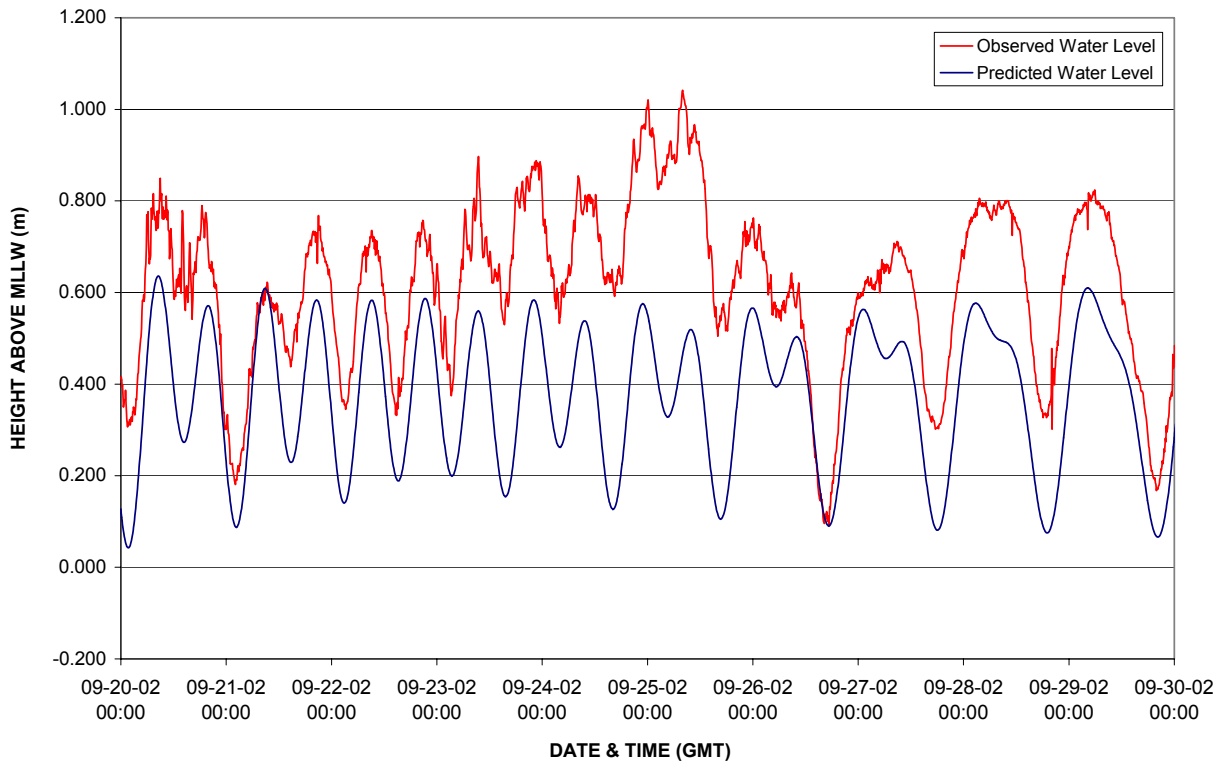


SABINE PASS NORTH, TX - OBSERVED -vs- PREDICTED WATER LEVELS

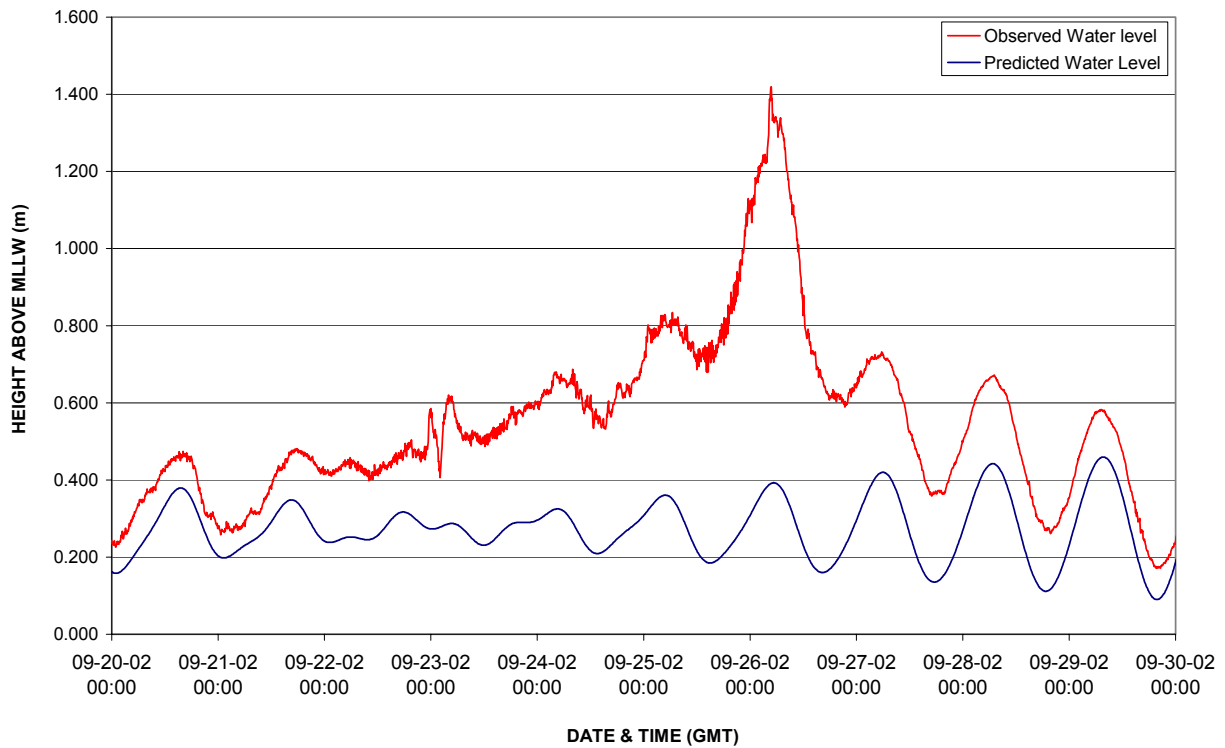
Peak Elevation 0.963 09/25/02 08:48



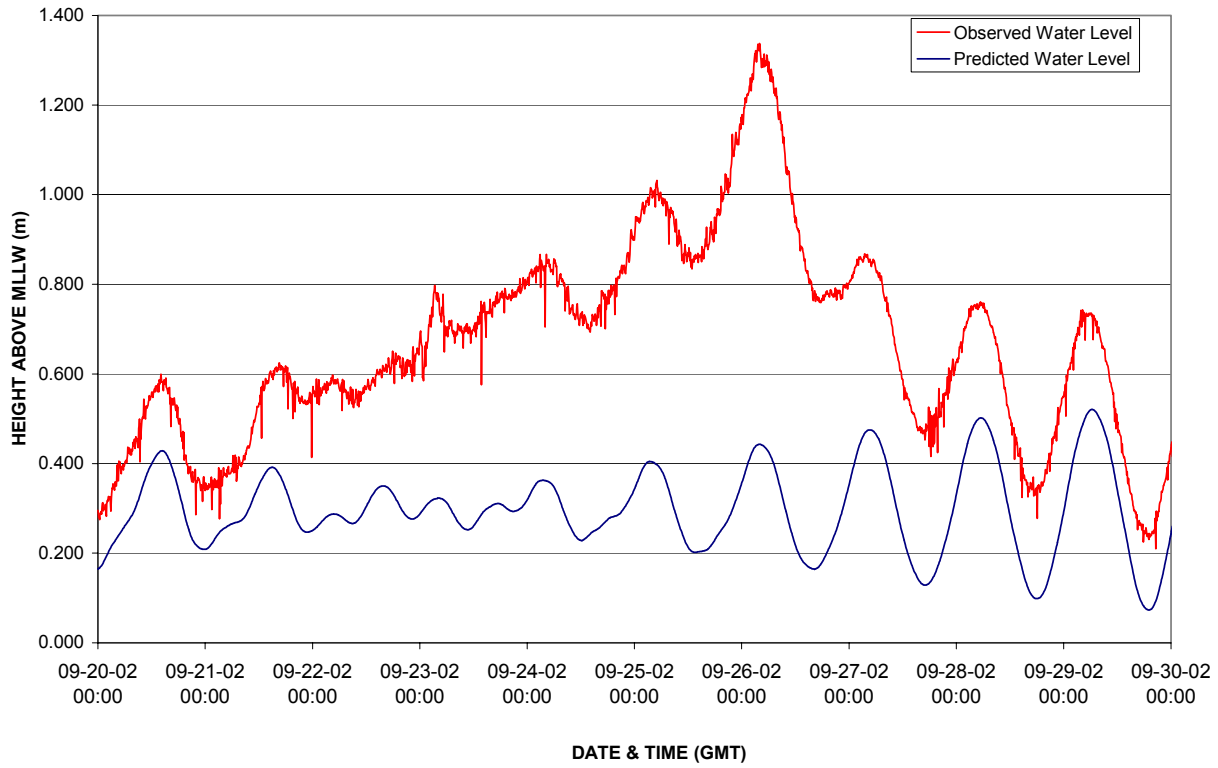
CALCASIEU PASS, EAST JETTY, LA - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.042 09/25/02 08:00



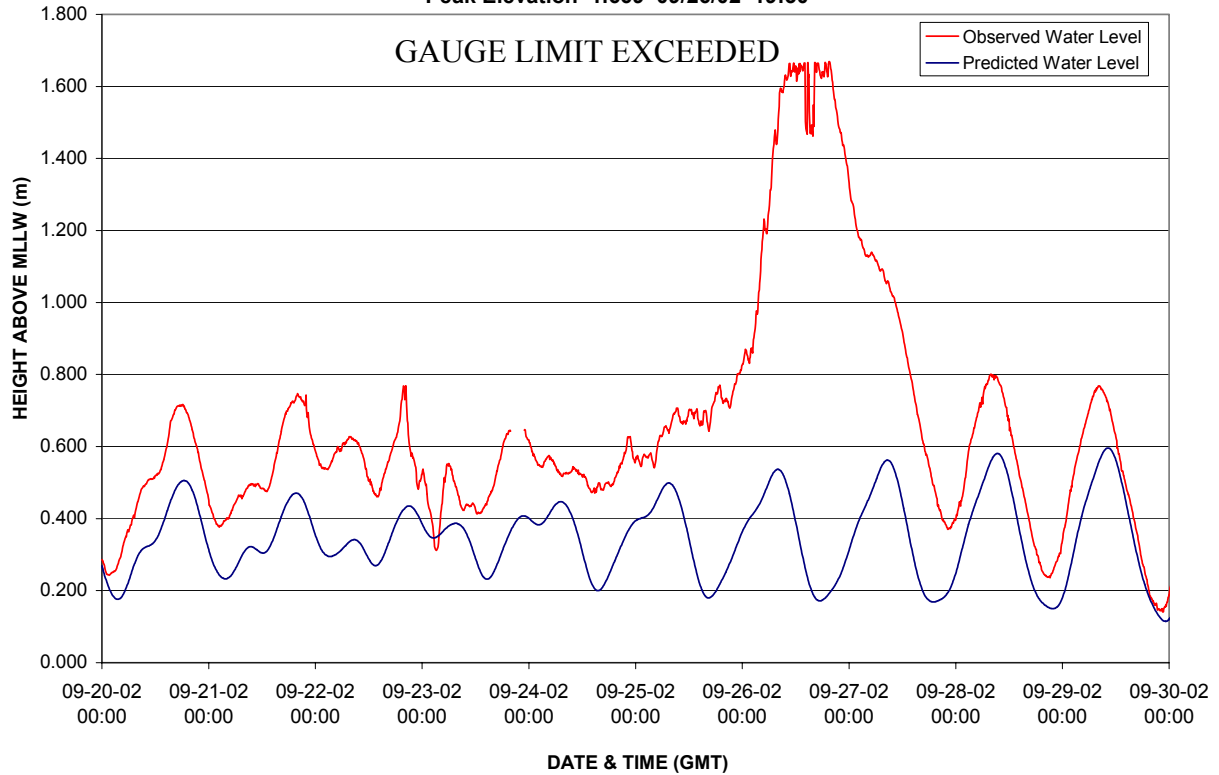
GRAND ISLE, EAST POINT, LA - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.420 09/26/02 04:48



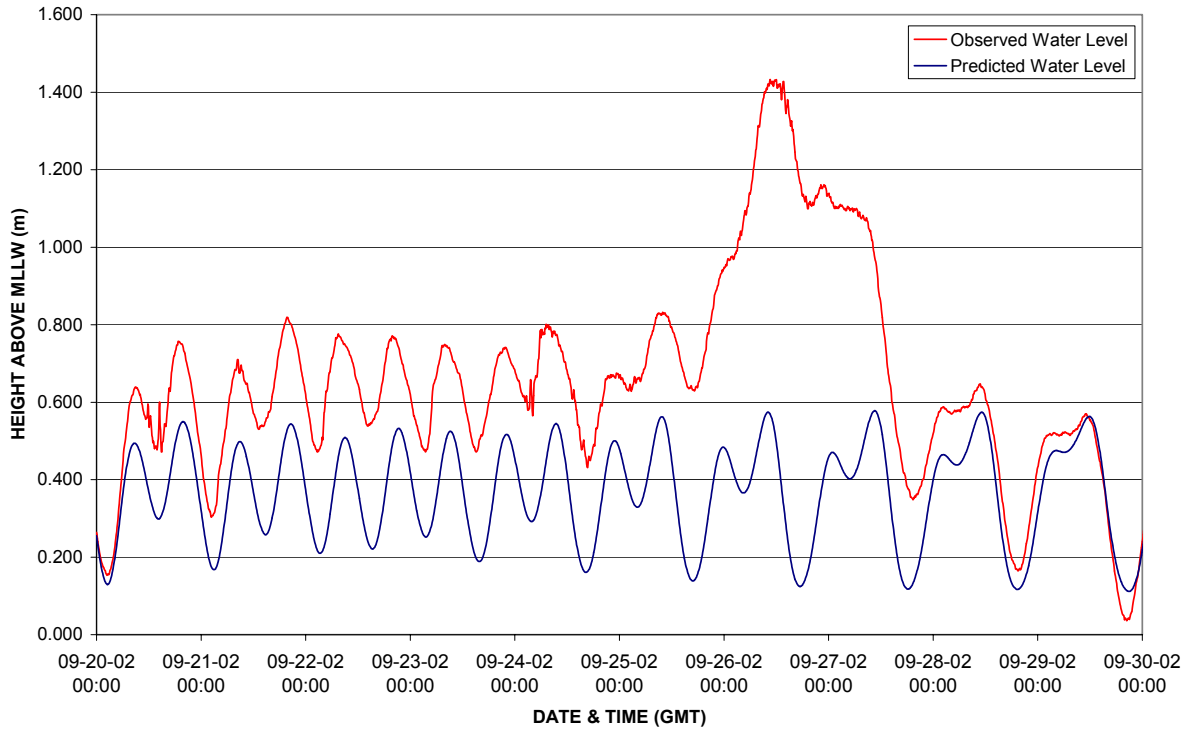
PILOT STATION, SW PASS, LA - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.338 09/26/02 04:00



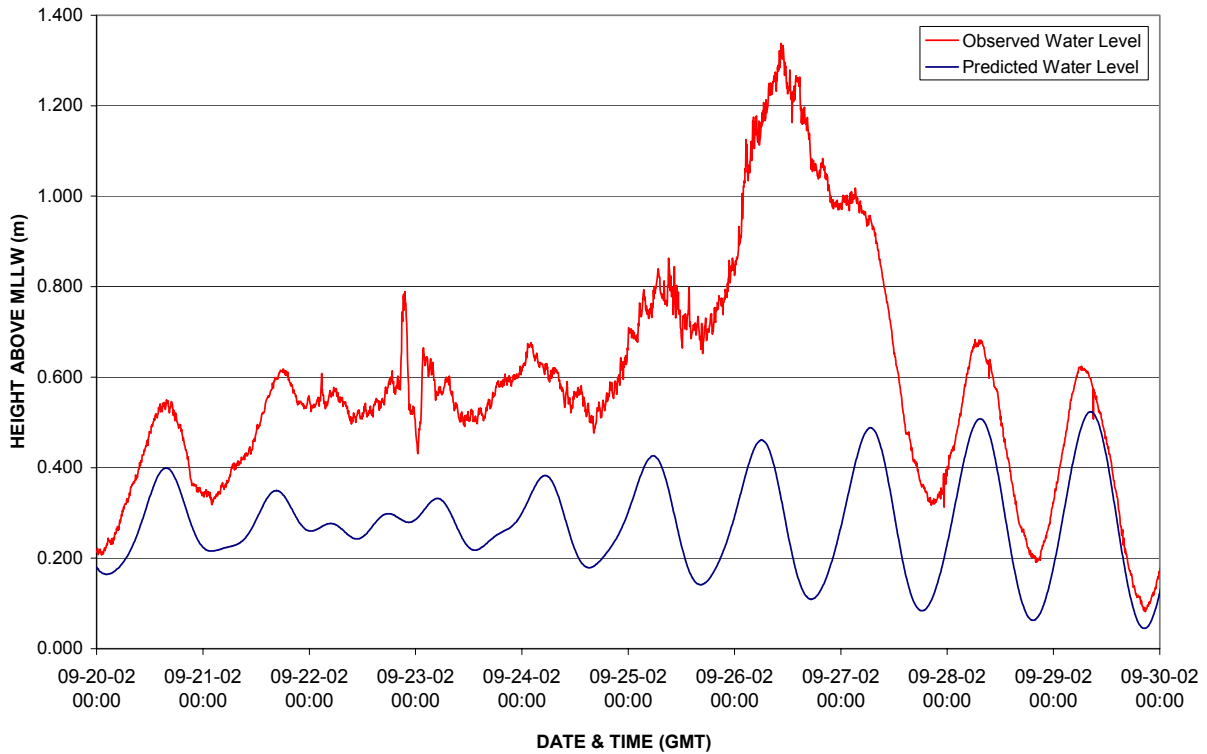
MOBILE, MOBILE CHANNEL, AL - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.669 09/26/02 19:30



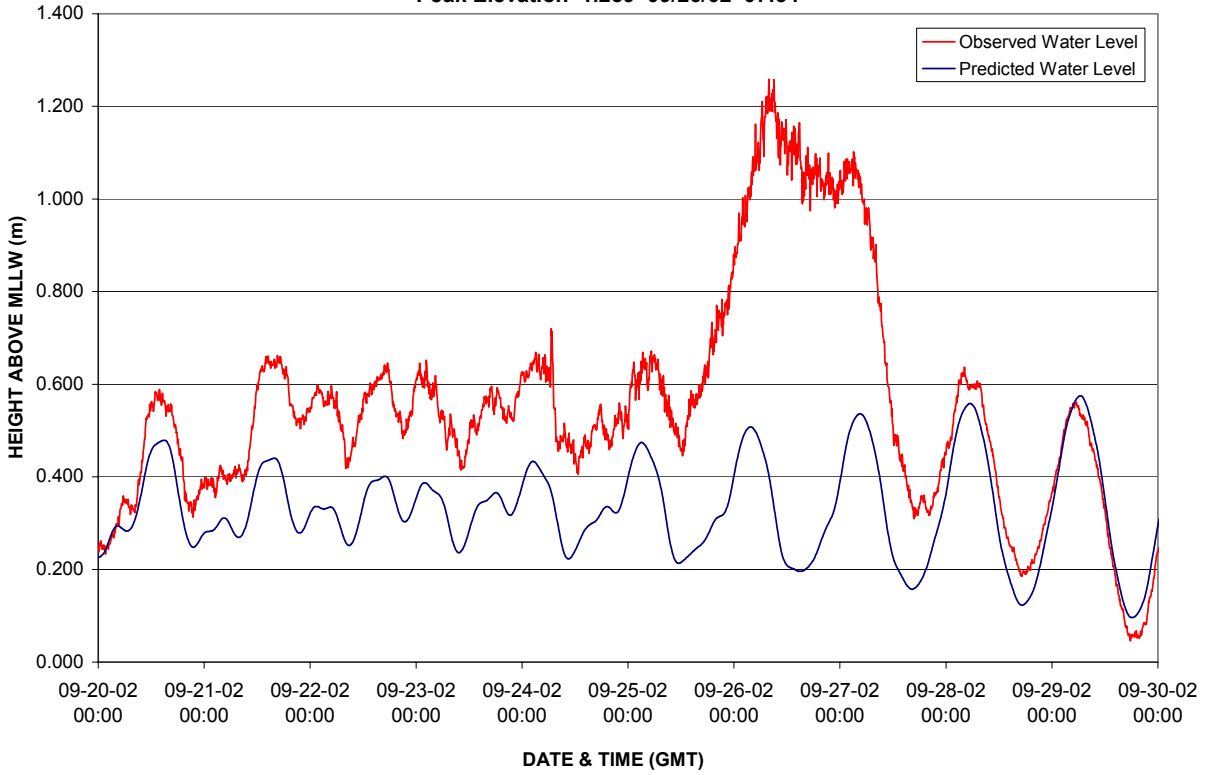
APALACHICOLA, APALACHICOLA RIVER, FL - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.433 09/26/02 10:36



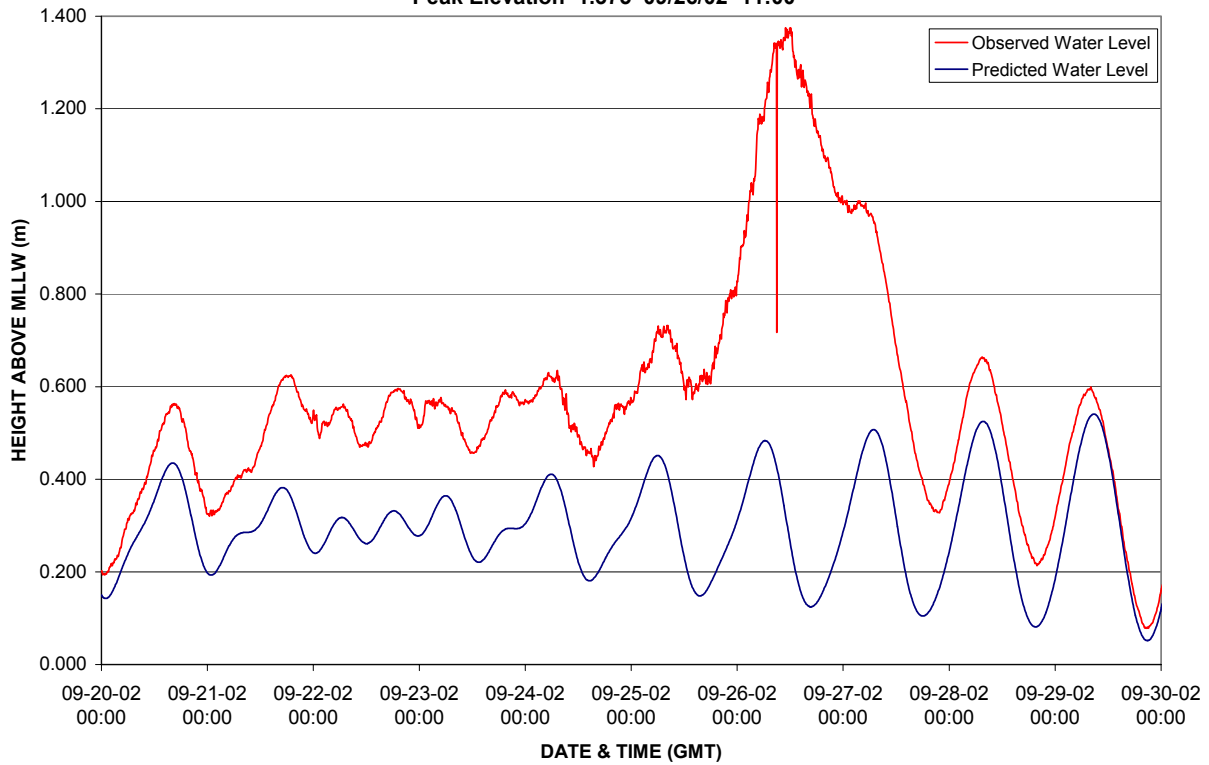
DAUPHIN ISLAND, MOBILE BAY, AL - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.338 09/26/02 10:30



PANAMA CITY BEACH, FL - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.259 09/26/02 07:54

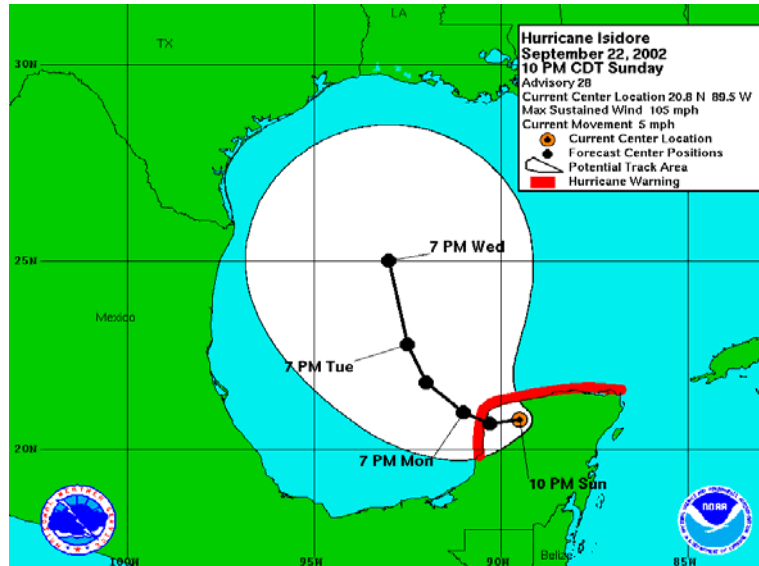


PENSACOLA, PENSACOLA BAY, FL - OBSERVED -vs- PREDICTED WATER LEVELS
Peak Elevation 1.375 09/26/02 11:00



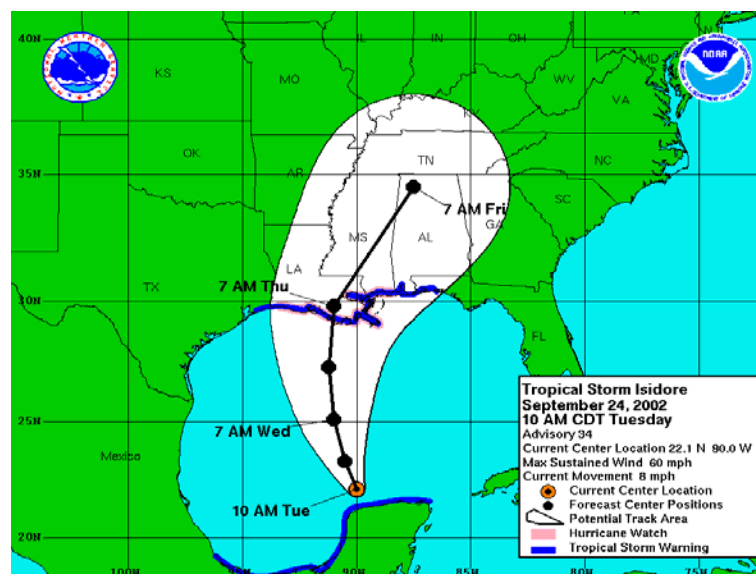
Hurricane Isidore began heading north towards the Gulf Coast of the United States on September 22, 2002 after looping around the northern edge of the Yucatan Peninsula near Merida, Mexico. See figure 3 below.

Figure 3. Projected path of Hurricane Isidore, September 22, 2002.



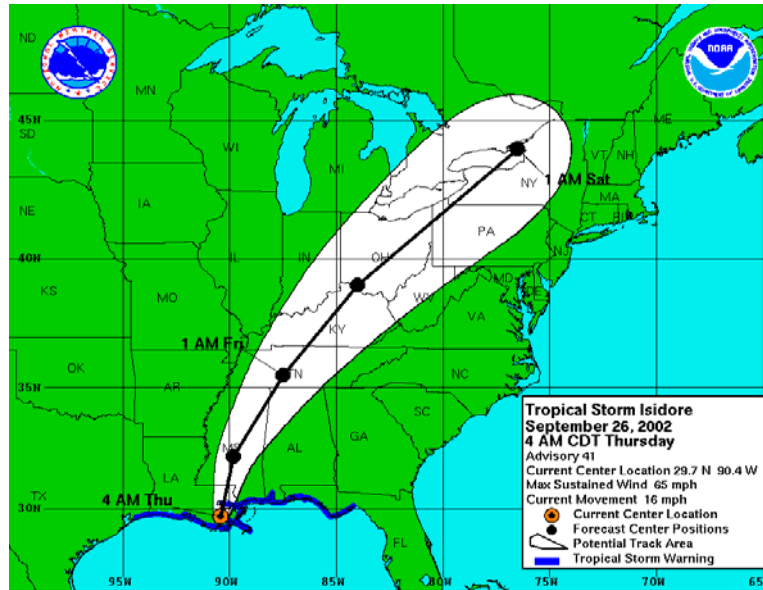
Shortly after moving northward into the Gulf, Hurricane Isidore was downgraded to a Tropical Storm. By Tuesday, September, 24 at 10:00am a tropical storm warning was issued for the Gulf Coast from Galveston, TX to Panama City, FL. Tropical Storm Isidore was projected to pass near Grand Isle, La. See figure 4 below.

Figure 4. Projected path of Hurricane Isidore, September 24, 2002.



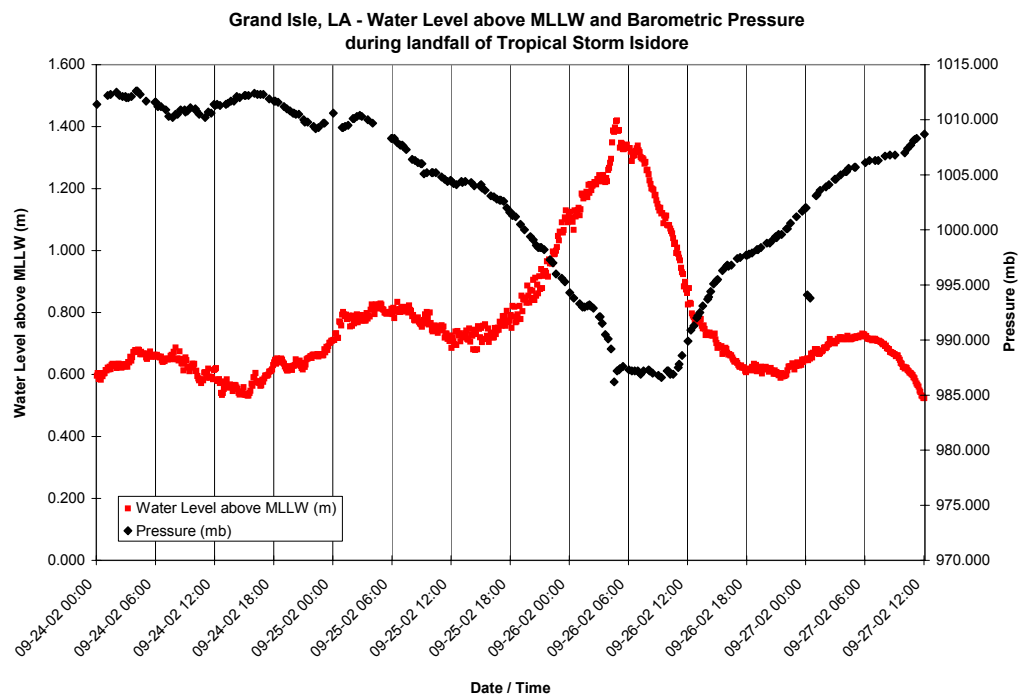
Early Thursday morning September 26, 2002, Tropical Storm Isidore made landfall very near to Grand Isle, LA. See figure 5 below.

Figure 5. Landfall of Tropical Storm Isidore, Thursday, September 26, 2002.



During landfall the Grand Isle tide gauge recorded changes in water level and barometric pressure. See figure 6 below.

Figure 6. Water levels above MLLW and barometric pressure recorded during landfall of Tropical Storm Isidore near Grand Isle, LA, September 26, 2002, 04:00am.



In addition to the collection of water level and barometric pressure the Grand Isle station also recorded wind speed and direction. This real-time data accessible via the CO-OPS TIDES ONLINE website shows fluctuations in wind speed and wind direction during Tropical Storm Isidore and the probable passage of Isadore’s “eyewall”. See figure 7 below.

Figure 7. Probable passage of Tropical Storm Isidore’s “eyewall” over Grand Isle, LA Tide station. September 26, 2002.

