

Tropical Cyclone Report  
Tropical Storm Debby  
(AL042012)  
23-27 June 2012

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Updated 21 February to include National Flood Insurance damage estimates and more specific information about the tornado count in Florida.

Debby was a large tropical storm that formed in the south-central Gulf of Mexico and made landfall in the Florida Big Bend region. It caused considerable freshwater flooding, primarily in central and northern Florida.

a. Synoptic History

Debby's development was slow and complicated. During the middle part of June, the Intertropical Convergence Zone (ITCZ) migrated northward to a position over southern Mexico after the passage of the rising branch of the Madden-Julian Oscillation (MJO) in the eastern Pacific. Within the anomalous low- to mid-level westerly flow associated with the northward-displaced ITCZ, a mid-level cyclonic circulation formed over the eastern Gulf of Tehuantepec on 18 June. A weak surface low pressure area developed in association with this feature by 19 June as the mid-level center moved inland. The low gradually moved north-northeastward across the Yucatan peninsula during the next couple of days toward a weakness in the subtropical ridge over the central Gulf of Mexico. Meanwhile, a large area of showers and thunderstorms, associated with the northern end of a tropical wave, fractured and began moving northwestward across the northwestern Caribbean Sea on 18 June. The fractured portion of the wave reached the southeastern Gulf of Mexico on 20 June, and merged with the disturbance near the Yucatan peninsula over the next couple of days.

The merger of the two systems resulted in a trough of low pressure over the southeastern Gulf of Mexico by 22 June. Disorganized bursts of convection were occurring east of the trough axis due to moderate westerly vertical wind shear associated with an upper-tropospheric trough over the western Gulf of Mexico. Upper-level divergence was enhanced ahead of the trough, and a long convective band developed southeast of the sharpening surface trough by early on 23 June. Data from an Air Force Reserve Hurricane Hunter aircraft indicated that a circulation had formed within the surface trough and had become well defined. Data from the aircraft as well as ship reports also indicated winds of tropical storm force, and a tropical storm formed around 1200 UTC that day about 250 n mi south-southeast of the mouth of the Mississippi River. The

“best track” chart of Debby’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1<sup>1</sup>.

Debby moved slowly and erratically north-northeastward during the next 24 h, and its forward motion slowed further when the cyclone moved into a col region between two mid-level ridges, one over the central Plains and the other over the northern Caribbean Sea. Despite continuing westerly shear, Debby gradually intensified and reached a peak intensity of 55 kt, when the storm’s extensive convective shield expanded over the northeastern Gulf of Mexico on 24 June. However, dry air over the southern United States began to wrap around the circulation of the storm by 25 June, and westerly shear increased further in association with a shortwave trough passing through the eastern Great Lakes. In addition, the slow movement of the storm over shallow warm waters upwelled cooler waters. In response to these factors, the deep convection associated with Debby dissipated early that day and weakening commenced.

Although a new burst of deep convection re-developed north of the center and over the Florida Panhandle on 25 June, the entrainment of an even drier air mass at mid- to upper-levels around the circulation from the west prevented any significant re-intensification. An unusually deep mid-latitude trough digging into the western Atlantic caused the forward speed of Debby to increase while cyclone turned east-northeastward on 26 June. Debby approached the coast of the Florida Big Bend that afternoon, with the cyclone producing only a small area of convection well northeast of the center due to strong westerly shear and considerable dry air. Debby’s center made landfall near Steinhatchee, Florida, around 2100 UTC 26 June. The cyclone then crossed north-central Florida that evening and weakened to a tropical depression, centered about 30 n mi southwest of Gainesville around 0000 UTC 27 June.

The center of Debby moved across the remainder of north-central Florida, emerging offshore of the northeastern Florida coast by 1200 UTC 27 June. By this time, the low-level circulation had become distorted as it accelerated into the western Atlantic where a high-shear environment prevailed. A 1528 UTC ASCAT overpass suggested that the circulation of Debby was dissipating, and Debby degenerated into an open trough by 1800 UTC 27 June.

Although not reflected in the best track, the remnants of Debby underwent some baroclinic re-development in association with the aforementioned upper-level trough over the western Atlantic. A new center of circulation formed east of a large area of convection between the Florida east coast and Bermuda on 28 June, and the non-tropical cyclone intensified slightly as it decelerated and neared Bermuda. As the upper-level trough overtook the low, convection decreased on 29 June, and system became more frontal in nature. The low accelerated northeastward over the North Atlantic on 30 June, and degenerated into an open trough around 1800 UTC June 30 several hundred nautical miles south of Newfoundland.

## b. Meteorological Statistics

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<sup>1</sup> A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year’s storms are located in the *btk* directory, while previous years’ data are located in the *archive* directory.

Observations in Debby (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Observations also include flight-level, stepped frequency microwave radiometer (SFMR), and dropwindsonde observations from six flights of the 53<sup>rd</sup> Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Tropical Rainfall Measuring Mission (TRMM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Debby.

The estimated maximum intensity of Debby is 55 kt. This estimate is based on a blend of peak 850 mb flight-level winds of 78 kt (62 kt after the standard adjustment) and maximum SFMR winds of 54 kt (51 kt bias-corrected) at 1748 UTC (Fig. 2). It should be noted that the intensity estimates for Debby, based largely on a wealth of aircraft data, were generally above the subjective Dvorak classifications. The minimum pressure estimate of 990 mb at 0000 UTC 25 June was based on a dropsonde measurement of 991 mb with 9-kt surface winds at 2337 UTC 24 June.

Ship reports of winds of tropical storm force associated with Debby are given in Table 2, and selected surface observations from land stations and data buoys are given in Table 3.

Sustained tropical-storm-force winds in association with Debby occurred over coastal portions of the Florida Panhandle through the Florida Big Bend on 24-25 June. The highest 2-min wind reported in this region was 39 kt at Apalachicola, with a gust to 52 kt. A period of tropical-storm-force winds occurred in a long and well-defined convective band over the eastern semicircle of the storm that moved over the west-central Florida coast around 0000 UTC 25 June. This same band affected portions of southwestern Florida early on 26 June, and sustained winds of 39 kt with a gust to 49 kt were reported at Fort Myers airport (FMY) at 1027 UTC 26 June. A 10-min wind of 37 kt with a gust to 58 kt was also reported in Venice, Florida, that day in association with the band. The non-tropical low that formed from the remnants of Debby produced a significant area of gale-force winds as it moved across the west-central Atlantic, with NOAA buoy 41048 reporting sustained 41 kt winds around 1900 UTC 28 June. Early on 29 June, winds to near tropical storm force were reported in Bermuda as the center of the low passed about 80 n mi north of the island.

Debby produced two days of torrential rains across portions of the Florida peninsula, with central and north Florida receiving the bulk of the rainfall (Figure 4). The highest storm total observed was near Curtis Mill in Wakulla County, where a local resident measured 28.78 inches (731 mm). Several reports greater than 20 inches were received in this same region, about midway between Tallahassee and Apalachicola. A second maximum in rainfall, with totals also in excess of 20 inches, occurred between Lake City and the Florida/Georgia border. Widespread rainfall totals of greater than 10 inches were reported over the west-central Florida coast north of Tampa to the eastern Florida Panhandle and eastward to parts of northeastern Florida.

Several days of onshore flow along the west coast of Florida and the Florida Panhandle resulted in storm surge flooding in many communities. Storm surges of 2 to 4.5 ft were common from the southwestern coast Florida to the Florida Panhandle, resulting in inundation values of 1 to 3 ft above ground level. The highest surge (inundation) was reported around the Big Bend region, with the highest values between Apalachicola and Cedar Key. Even higher values could have occurred in remote areas along the coast in this area. Storm surge flooding of 1 to 3 ft occurred along the northern Gulf coast from the western Florida Panhandle to southeastern Louisiana, with inundation values of up to 2.5 ft across this region. Along the Florida Atlantic coast and well as the southern portion of the southeast United States coast, an onshore wind associated produced storm surge flooding of 2 to 3 ft was observed, leading to inundation values of 2 ft or less.

Rain bands east of the center of Debby produced a significant number of tornadoes on 23 and 24 June. Data from the NOAA Storm Prediction Center indicate that 24 tornadoes affected portions of central Florida on these dates (Fig. 5). The first group of relatively short-lived tornadoes, most with a rating of EF0 on the Enhanced Fujita (EF) scale, affected parts of southwestern Florida on 23 June. The following day a larger outbreak of tornadoes occurred over a wide portion of the southern and central Florida peninsula, with several of these receiving a rating of EF1 and EF2.

#### c. Casualty and Damage Statistics

There were five direct deaths<sup>2</sup> attributed to Debby. A tornado spawned by one of Debby's rain bands threw a mother and her 3-year-old child from their mobile home in Venus, Florida, killing the mother. Two people drowned in rough surf conditions, one in Pinellas County, Florida, and the other in Orange Beach, Alabama. Another person drowned after his canoe capsized near Lake Dorr, Florida, in Lake County. A man was found floating in flood waters near Anclote Key, Florida, and was presumed to have been drowned by the storm.

Debby was also responsible for three indirect deaths. An elderly male died following a heart attack while wading through flood waters in Pinellas County, Florida. Two others died in Florida as a result of car crashes in wet roads caused by the storm.

Much of the damage caused by Debby was the result of freshwater flooding from heavy rains across portions of northern and central Florida. In Wakulla County, where some of the heaviest rains occurred, the Sopchoppy River crested at a record height of 36.8 ft on 26 June. At least 400 structures were reported to have been severely affected by the flooding. River flooding also occurred along the Anclote and Pithlachascotee Rivers in Pasco County, which resulted in "head deep" water in several nearby communities. The river flooding, combined with inundating rains related to the storm, caused damage to 106 homes in the county. In Live Oak, flood levels along the Suwanee River were the highest observed since Hurricane Dora in 1964. A portion of

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<sup>2</sup> Deaths occurring as a direct result of the forces of the tropical cyclone are referred to as "direct" deaths. These would include those persons who drowned in storm surge, rough seas, rip currents, and freshwater floods. Direct deaths also include casualties resulting from lightning and wind-related events (e.g., collapsing structures). Deaths occurring from such factors as heart attacks, house fires, electrocutions from downed power lines, vehicle accidents on wet roads, etc., are considered "indirect" deaths.

U.S. Highway 90 was closed and remained closed for nearly two weeks. The St. Mary's River at Macclenny reached a record flood stage of 24.4 ft on 27 June, with some of the flooding spilling over onto Interstate 10, which was closed for two days when flood waters crossed the road. Finally, in Clay County, the overflow of Black Creek resulted in the inundation of 587 nearby residences. Roads in several communities were either impassable or washed away, and there were reports of bridge collapses at a number of locations.

Storm surge flooding affected coastal areas of the Florida Panhandle and Florida Big Bend. Numerous roads and some area businesses in Saint Marks and Panacea were under water, while the surge reportedly submerged portions of U.S. Highway 98. High water was reported across many roads, with Alligator Point Road and Indian Pass Road significantly damaged or washed out in a few places. Along the west-central Florida coast, similar storm surge flooding was reported along U.S. Highway 19 near Hudson and also on the Suncoast Parkway, which was closed for a week due to standing water. Beach erosion was especially severe across this region due to several days of continuous onshore flow. It is estimated that most of the beaches from Charlotte County northward through Pinellas County lost up to 10 to 15 ft of sand as a result of the surge, tidal fluctuations, and large battering waves. The worst beach erosion occurred in Treasure and Anna Maria Islands.

According to the Property Claims Services of the Insurance Services Office, Inc., the insured losses in the state of Florida are \$105 million. FEMA's National Flood Insurance Program (NFIP) reported \$40 million in flood damage so far. However, the tally by county is not part of this estimate, suggesting that the total could eventually be higher. The preliminary total damage is estimated at \$250 million, based on a double of the total insured damage as well as the flood losses reported to date.

Nine oil production platforms and one oil drilling rig were damaged. Overall U.S. oil production decreased by as much as 2% on 25 June as oil production was temporarily suspended due to the storm; oil production was rapidly restored to normal.

#### d. Forecast and Warning Critique

The genesis of Debby was well anticipated. The tropical wave that was involved in the genesis of Debby was introduced to the Tropical Weather Outlook at 0600 UTC 19 June, about 102 h before genesis. The disturbance was initially given a low chance (<30%) of tropical cyclone formation, but the genesis probability was increased to the medium (30-50%) and then the high category (>50%) about 54 h and 30 h prior to genesis, respectively. The long lead time of the genesis forecasts of Debby can be attributed to the slow and complicated evolution of the pre-Debby disturbances in a marginally favorable environment.

A verification of NHC official track forecasts for Debby is given in Table 4a. Official forecast (OFCL) track errors were larger than the mean official errors for the previous 5-yr period at all forecast times through 72 h, and considerably so after 24 h. Official track errors were about double the 5-yr mean at 36-48 h and triple that at 72 h. There were no verifying forecasts at 96 h and 120 h. Early track guidance indicated a dichotomy in the model forecast

tracks, with almost as many model solutions taking Debby toward the Texas coast as solutions showing a northeastward track toward north Florida. The European Centre for Medium-Range Forecasting (EMXI) model and its ensemble members largely favored a track toward Texas (Figure 6), while the GFS and a majority of GFS ensemble members were directed toward northern Florida and the western Atlantic (Fig. 7). Early official forecasts placed more weight on ECMWF model solutions, partially because of the superior performance of this model during the last few years. In addition, a significant number of Global Ensemble Forecast System (GEFS) solutions suggested a similar track. A homogeneous comparison of the official track errors with selected guidance models is given in Table 4b. A majority of the track guidance had lower errors than OFCL, especially at 72 h. However, the sample size at that time was too small to draw any meaningful conclusions. The Global Forecast System (GFSI) and Canadian (CMCI) were the best performing models, while the Hurricane Weather Research and Forecasting (HWFI) model, EMXI, and United Kingdom Meteorological (EGRI) model had very large forecast errors.

A verification of NHC official intensity forecasts for Debby is given in Table 5a. Official forecast (OFCL) intensity errors were lower than the mean official errors for the previous 5-yr period through 36 h but were considerably higher than the 5-yr mean at 48 h and 72 h. Early forecasts over-predicted the intensity of Debby, indicating that it would become a hurricane. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 5b. Most of the intensity guidance outperformed OFCL from 36-72 h, with GHMI performing exceptionally well at all times after 12 h. The sample size by 72 h, however, is too small for any meaningful conclusions to be drawn.

Watches and warnings associated with Debby are given in Table 6. Tropical storm watches and/or warnings were required for a large portion of the central and eastern Gulf of Mexico coasts due to the large size of Debby. A tropical storm warning was first issued for a portion of the southeastern Louisiana coast at the time Debby formed on 23 June but was discontinued early the following day when the track of the storm shifted eastward. A tropical storm warning was then issued along a portion of the northern Gulf coast from the Alabama/Mississippi border to the Ochlocknee River in Florida at 1200 UTC 24 June. This warning had a short lead time of about 6 h, since tropical storm conditions are believed to have first occurred along coastal portions of the Florida Panhandle later that afternoon.

A tropical storm watch was issued along portions of the west Florida coast from the Suwannee River to Anclote Key at 1500 UTC 24 June but was extended southward to Englewood at 2100 UTC. The watch was upgraded to a warning at 1500 UTC 25 June, as the center of the tropical storm was approaching the Florida Big Bend area. Although it was not considered likely, some areas around the Tampa Bay area experienced a period of tropical storm conditions in a well-defined band crossing this region around 0000 UTC 25 June. The warning was issued approximately 12 to 18 h before the first tropical storm conditions began to affect the southwest Florida coast, in the same persistent band that had affected the west-central Florida coast the previous evening.

e. Acknowledgements

Thanks are extended to National Weather Service Weather Forecast Offices in the affected areas, the National Data Buoy Center, and the National Ocean Service supplied surface and storm surge data. All were useful in constructing the data tables and writing the casualty and damage section of this report. David Roth of the Hydrometeorological Prediction Center contributed additional rainfall information and Figure 4. Mike Fiorino provided the graphic in Figure 6, using data from the European Centre for Medium-Range Forecasting.

Table 1. Best track for Tropical Storm Debby, 23-27 June, 2012.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
23 / 1200	25.5	87.6	1002	35	tropical storm
23 / 1800	26.0	87.5	1001	40	"
24 / 0000	26.5	87.4	998	45	"
24 / 0600	27.0	87.2	995	50	"
24 / 1200	27.6	86.8	994	55	"
24 / 1800	28.0	86.3	992	55	"
25 / 0000	28.3	86.0	990	50	"
25 / 0600	28.6	85.8	993	45	"
25 / 1200	28.8	85.6	994	40	"
25 / 1800	29.0	85.3	992	40	"
26 / 0000	29.0	85.0	991	45	"
26 / 0600	28.9	84.7	991	40	"
26 / 1200	28.9	84.3	992	40	"
26 / 1800	29.2	83.7	995	35	"
26 / 2100	29.3	83.2	995	35	"
27 / 0000	29.4	82.7	997	30	tropical depression
27 / 0600	29.5	81.5	998	30	"
27 / 1200	29.5	80.3	1001	30	"
27 / 1800					dissipated
24 / 1800	28.0	86.3	992	55	maximum wind
25 / 0000	28.3	86.0	990	50	minimum pressure
26 / 2100	29.3	83.2	995	35	landfall near Steinhatchee, FL



Table 2. Selected ship reports with winds of at least 34 kt for Tropical Storm Debby, 23-27 June, 2012.

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
23 / 1200	C6FN4	21.6	85.6	170 / 39	1006.0
23 / 1800	WWAA	27.7	85.4	110 / 39	1010.0
23 / 2300	WWAA	27.5	84.5	110 / 37	1010.0
24 / 0000	ZCDJ2	26.1	86.0	180 / 38	1001.6
24 / 0200	WDE538	27.4	85.5	120 / 40	1002.0
24 / 0200	WWAA	27.6	83.7	110 / 37	1010.0
24 / 0600	WCY705	27.0	84.9	210 / 43	1003.1
24 / 0600	WDE538	28.1	86.0	070 / 48	997.4
24 / 0900	WDE538	28.7	86.9	070 / 50	999.2
24 / 1200	WDE538	29.2	87.5	070 / 45	1004.5
24 / 1500	C6FV4	28.6	87.9	000 / 35	1006.0
24 / 2100	WDF272	28.3	88.1	360 / 37	1010.0
25 / 0000	C6FV4	29.0	87.6	360 / 37	1001.0
26 / 0600	C6FN2	24.4	80.8	190 / 38	1009.0
26 / 0900	WGAX	32.9	78.8	050 / 38	1006.4
26 / 1200	WGAX	33.3	78.1	050 / 37	1007.1

Table 3. Selected surface observations for Tropical Storm Debby, 23 -27 June 2012

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
<b>Florida</b>									
<b>ICAO Sites</b>									
Jacksonville International Airport (KJAX)	26/2204	1001.7	25/1135	30	35				13.78
Craig Municipal Airport (KCRG)	26/2241	1001.7	25/0621	22	34				12.89
Mayport Naval Station (KNRB)	27/0056	1002.0	25/0637	30	39				12.05
Jacksonville Naval Air Station (KNIP)	26/2135	1001.3	25/1059	24	44				10.55
Saint Augustine Airport (KSGJ)	26/2051	1000.7	25/0450		40				
Bunnell (KXFL)	26/2050	1001.3	25/1850		30				
The Villages (KVVG)			24/2035	20	31				
Gainesville Regional Airport (KGNV)	26/1914		26/2343	27	36				12.02
Daytona Beach International (KDAB)	26/2248	1001.6	25/1927	21	32				
Fort Pierce (KFPR)	26/2151	1003.9	26/1854	29	38				
Leesburg International Airport (KLEE)	26/2204	1000.9	25/2227	25	34				5.79
Melbourne International (KMLB)	26/2202	1002.9	26/1805	25	33				
Orlando International (KMCO)	26/2304	1001.9	26/1845	25	33				
Orlando Executive (KORL)	26/2152	1001.9	25/2107	27	39				
Orlando/Sanford (KSFB)	26/2241	1001.2	25/1957	26	34				
Vero Beach (KVRB)	26/2153	1003.9	26/1839	31	42				
Okeechobee County Airport (KOBE)			26/1755	23	34				
Patrick AFB/Cocoa (KCOF)	26/2155	1003.3	27/0955	27	39				
Witham Field/Stuart (KSUA)			26/2147	25	40				
Space Coast Regional/Titusville (KTIX)			26/1650	26	34				
Kissimmee Gateway (KISM)			26/2050	20	36				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Cape Canaveral (KXMR)	26/2105	1002.8	26/1255	23	36				
USAF Tower 22 28.80 N 80.74 W			25/0540	35	49				
Holmes County (KLJO)	25/2058	997.6	25/1558	21	29				
Mariana (KMAI)	25/2053	1000.6	25/1553	21	30				
Panama City NW (KECP)	25/1942	1000.4	26/1553	23	36				
Tyndall AFB (KPAM)	25/1853	997.7	24/2053	22	37				
Tallahassee Regional (KTLH)	26/0853	1000.1	24/2053	24	32				8.94
Perry-Foley (K40J)	24/2253	997.4	26/1953	16	27				
Cross City (KCTY)	26/2053	997.4	25/1753	16	27				11.85
Brooksville (KBKV)	26/0753	1001.1	26/0053	24	35				15.39
Tampa International Airport (KTPA)	26/0653	1001.8	26/0153	30	46				10.48
Saint Petersburg (KPIE)	26/0853	1001.1	25/2030	31	44				10.72
Albert Whitted (KSPG)	26/0653	1000.8	24/1453	33	49				9.41
Sarasota (KSRQ)	26/0853	1001.7	25/1851	28	48				5.63
Macdill Airforce Base (KMCF)	26/1209	1002.1	26/2109	27	37				9.51
Winter Haven (KGIF)	29/1653	1002.2	25/1846	27	39				7.35
Punta Gorda (KPGD)	26/0853	1004.4	25/1717	34	46				6.80
Fort Myers Page Field (KFMY)	26/0853	1004.4	26/1653	23	37				5.32
Fort Myers (KRSW)	26/0753	1004.5	26/1027	39	49				3.03
The Villages (KVVG)	26/2015	1000.7	26/1935	18	31				
Lakeland Field (KLAL)	26/0935	1002.7	26/1650	23	32				
Leesburg (KLEE)	26/2053	1001.4	25/0153	21	34				
Mary Esther (KHRT)	25/1955	1001.0	25/2143	22	33				0.73
Destin (KDTS)	25/1953	1000.6	24/1448	19	33				0.61
Valpariso (KVPS)	25/1956	1001.0	25/1755	24	41				0.70
Pensacola NAS (KNPA)	25/0956	1004.0	25/1556	23	31				
Pensacola Regional (KPNS)	25/2053	1001.7	25/1653	18	30				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Apalachicola Airport (KAAF)			25/1953	30	57				
<b>Marine Observations</b>									
NOS Station Fernandina Beach (FRDF1) 30.67 N 81.47 W	26/2218	1001.9	24/2006	18	32	3.21	3.84	1.11	
NOS Station Mayport (MYPF1) 30.40 N 81.43 W	26/2142	1003.7	26/236	30	38	2.59	3.21	1.26	
Buoy 41012 30.04 N 80.52 W	26/2250	1002.4	25/1820	29	41				
Buoy 41009 28.52 N 80.18 W	27/1150	1003.2	26/1350	24	34				
Trident Pier (TRDF1) 28.42 N 80.59 W	26/2118	1003.2	27/1018	26	32	1.46	1.83	0.78	
Panama City Beach NOS (PCBF1) 30.21 N 85.88 W	25/1942	998.7	24/2124	24	38				
Apalachicola NOS (APCF1) 29.73 N 84.98 W			24/1848	39	52	3.56	3.87	3.01	
Apalachicola Reserve (APXF1) 29.79 N 84.88 W	25/2115	995.0	24/1415	30					
Shell Point (SHPF1) 30.06 N 84.29 W	25/2018	995.6	24/1806	20	37				
Shell Beach NOS (SHBL1) 29.87 N 89.67 W	25/2248	1005.5	24/1436	21	27				
Keaton Beach (KTNF1) 29.82 N 83.59 W	26/2000	999.0	24/1800	23	28				
Apalachicola Tide	25/2124	993.1	25/2300	35	45				
Cedar Key-CMAN (CDRF1) 29.14 N 83.03 W	26/2242	996.6	24/1912	36	46				
Buoy 42036 28.50 N 84.52 W	26/0750	993.2	24/0650	35	41				
Venice-CMAN (VENF1) 27.07 N 82.45 W	26/0900	1002.4	26/0200	37 <sup>f</sup>	58 <sup>f</sup>				
Clearwater Beach (CWBF1) 27.98 N 82.83 W	26/0930	999.9	24/2348	38	50	3.10	3.66	2.67	

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	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Egmont Key (EGKF1) 27.60 N 82.76 W	26/0924	1001.8	24/2354	34	45				
Anna Maria-comps (ANMF1) 27.55 N 82.75 W	26/0700	1001.7	25/2312	25	41				
Old Port Tampa (OPTF1) 27.86N 82.55W	26/0830	1001.3	25/0800	35	46	3.97		2.96	
Aripeka (ARPF1) 28.43N 82.67 W	26/0924	1000.4	27/0100	17	26				
C12 Buoy 27.50 N 83.72 W			26/0529	29					
C13 Buoy 26.06 N 83.07W			26/0000	31	39				
Big Carlos Pass (BFCF1) 26.40 N 81.88 W	26/1012	1004.6	26/1012	34	42				
Fred Howard Park (FHFP1) 28.15 N 82.80 W	26/0924	1000.7	25/0018	35	58				
Anclote Gulf Park (ANCF1) 28.19 N 82.79 W	26/0918	999.6	27/0242	27	34				
Tarpon Springs (TAS) (TARF1) 28.16 N 82.76 W			25/0018	17	32				
Seabulk (SBLF1) 27.92 N 82.45 W			26/1354	26	33				
East Bay Causeway (TSHF1) 27.93 N 82.43 W			25/2030	27	36				
Fort Myers (FMRF1) 26.65 N 81.87 W	26/0912	1004.0	26/1024	16	31	3.09	2.94	2.67	
Naples (NPSF1) 26.13 N 81.81 W	26/0800	1005.8	26/1100	30	44	2.85	2.68	2.10	
Buoy 42003 26.04 N 85.61 W	26/0850	1002.7	23/1450	33	45				
Saint Petersburg (SAPF1) 27.76 N 82.63 W	26/0824	1002.2	25/0106	32	42	3.56		2.61	
Pensacola NOS (PCLF1) 30.404 N 87.211 W						1.85	2.53	1.60	
Panama City NOS (PACF1) 30.152 N 85.667 W						1.73	2.18	1.40	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Cedar Key NOS (8727520) 29.135 N 83.032 W						4.49	4.53	2.99	
Port Manatee NOS (PMAF1) (8726384) 27.639 N 82.562 W						3.26	2.89	2.24	
McKay Beach Entrance NOS (8726667) 27.913 N 82.425 W						4.07	3.95	2.95	
Vaca Key NOS (VCAF1) (8723970) 24.712 N 81.105 W						1.10	0.54	0.91	
Lake Worth Pier NOS (LKWF1) 26.612 N 80.033 W						0.91	1.15	0.60	
St. Johns River NOS (I-295 Bridge)						2.18	2.55	2.01	
<b>Public/Other</b>									
3 SE Sanborn 30.03 N 84.57 W									28.78
Sanborn 30.06 N 84.60 W									26.23
7.0 SSE Crawfordville 30.08 N 84.33 W									23.00
3 WNW Crawfordville 30.19 N 84.42 W									22.30
7 NNW White Springs (WSGF1) 30.43 N 82.78 W									21.89
3.3 SE Spring Hill (FL-HN-7) 28.45 N 82.52 W									21.46
St. Marks 30.16N 84.2W									21.09
St. Marks 4 ESE (MSAMF1) 30.13N 84.14W									20.96
Panacea 30.01N 84.42W									20.63
Live Oak 30.30 N 82.90 W									20.13
Sandborn 1 ESE 30.07N 84.59W									20.10
Ichetucknee Spring 5 NE 30.02N 82.72W									19.99

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Sanderson 4.9 NNW (FL-BK-3_ 30.32N 82.28W									19.96
2.3 SE Brookridge (FL-HN-1) 28.53 N 82.46 W									19.51
4 N Hernando County Airport (FL-HN-1) 28.52 N 82.46 W									19.19
0.2 E High Point (FL-HN-9) 28.55 N 82.52 W									18.90
2 NE Crawfordville 30.19 N 84.35 W									18.80
Wakulla Springs State Park 30.23 N 84.30 W									18.79
1.5 NNE Spring Hill (FL-HN-2) 28.50 N 82.55 W									18.79
Brookridge 2.3 SE (FL-HN-19) 28.53N 82.46W									18.40
High Point 0.2E (FL-HN-9) 28.55N 82.53W									18.34
Mayo 30.05 N 83.18 W									18.28
Jacksonville Beach 4.4 WNW (FL-DV-19) 30.31N 81.44W									17.56
1 NNW San Pablo 30.31 N 81.44 W									17.48
2 E Lake City (LCTF1) 30.17 N 82.56 W									17.29
Jacksonville 7.5 E (FL-DV-2) 30.34N 81.53W									16.85
4 SSW Fort Caroline 30.34 N 81.53 W									16.85
2.2 SSE Palm Harbor (FL-PN-2) 28.06 N 82.75 W									16.60

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
8.2 SW St. Marks 30.07 N 84.30 W									16.24
Sumatra 1 W (SURF1) 30.02N 84.99W									16.23
2 NNE Port Richey (FL-PS-4) 28.30 N 82.71 W									16.10
1.6 NNW Spring Hill (FL-HN-1) 28.50 N 82.57 W									16.03
1 ENE Jasper (JASF1) 30.52 N 82.94 W									15.96
Live Oak 9.1 NW (FL-SW-2) 30.39N 83.09W									15.91
3 N Weeki Wachee (FL-HN-8) 28.56 N 82.58 W									15.70
Palm Harbor 2.2 SSE (FL-PN-2) 28.06N 82.75W									15.65
6 NNE Middleburg 30.14 N 81.88 W									15.64
6 E Baldwin 30.29 N 81.87 W									15.63
Jacksonville 13.0 W (FL-DV-49) 30.30N 81.87W									15.63
Live Oak 10.0 W (FL-SW-8) 30.31N 83.15W									15.59
6 NNE Middleburg 30.14 N 81.88 W									15.58
Jacksonville 10.3 SW (FL-DV-42) 30.235N 81.79W									15.55
Weeki Wachee 3.0N (FL-HN-8) 28.56N 82.58W									15.54
Spring Hill 1.6 NNW (FL-HN-1) 28.50N 82.57W									15.53
Natural Bridge Rd. (Leon County) 30.28N 84.15W									15.53



Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
2 SSE Woodville 30.28 N 84.24 W									15.53
Glen St. Mary 4.4 SW ((FL-BK-5) 30.24N 82.22W									15.50
Orange Park 4.1 WSW (FL-CY-25) 30.14N 81.77W									15.45
1 N Lakeside 30.14 N 81.77 W									15.44
1 S Jacksonville Heights 30.23 N 81.79 W									15.37
Suwannee 5 ESE									15.30
5 ESE Suwannee River State Park 30.39 N 83.09 W									15.30
Port Richey 2.0 NNE (FL-PS-4) 28.30N 82.71W									15.29
3 SSW Yulee 30.59 N 81.59 W									15.27
4 ESE Sanderson 30.23 N 82.21 W									15.23
Live Oak 0.4 NE (FL-SW-1) 30.30N 82.98W									15.23
Bellair-Meadowbrook 30.18 N 81.75 W									15.07
Orange Park 3.0 WNW (FL-CY-8) 31.18N 81.75W									15.07
Cooks Hammock 29.92 N 83.28 W									14.99
1.3 ENE Citrus Park (FL-HB-5) 28.08 N 82.55 W									14.97
2.4 WSW Chiefland (FL-LV-1) 29.46 N 82.90 W									14.96
1 N Glen St. Mary 30.29 N 82.16 W									14.94
Chiefland 2.4 WSW (FL-LV-10) 29.46N 82.90W									14.92

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Hedges 0.3 ESE (FL-NS-10)									14.85
Live Oak 30.29 N 82.98 W									14.74
Ames Sink 30.31 N 84.35 W									14.74
3.4 ESE Palm Harbor (FL-PN-4) 28.07 N 82.71 W									14.74
Jacksonville 8.8E (FL-DV-21) 30.36N 81.51W									14.72
Jacksonville 11.6 ENE (FL-DV-36) 30.33N 81.46W									14.71
2 SSW Fort Caroline 30.35 N 81.51 W									14.72
Macclenny 4.9 SSW (FL-BK-7) 30.22N 82.16W									14.67
3 NNW San Pablo 30.33 N 81.46 W									14.65
1 W Glen St. Mary (GSMF1) 30.27 N 82.19 W									14.59
Tarpon Springs (BTRF1) 28.14 N 82.76 W									14.55
2 SSE Doctors Inlet 30.09 N 81.76 W									14.54
Lakeside 2.9 S (FL-CY-4) 30.09N 81.76W									14.54
4 S Glen St. Mary 30.22 N 82.16 W									14.46
1 N San Pablo 30.30 N 81.44 W									14.43
Jacksonville Beach 3.9 WNW (FL-DV-9) 30.30N 81.44W									14.43
Macclenny 2.5 S (FL-BK-2) 30.24N 82.12W									14.43
3 S Macclenny 30.24 N 82.12 W									14.41

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Madison 30.47N 83.42W									14.40
2.5 ENE Hudson (FL-PS-3) 28.38 N 82.67 W									14.38
1 WNW San Pablo 30.30 N 81.45 W									14.33
Jacksonville 12.1 ESE (FL-DV-46) 30.30N 81.45W									14.33
1 ESE Live Oak (LVOF1) 30.28 N 82.97 W									14.26
Crawfordville 1 NNW 30.19N 84.38W									14.25
1 W Macclenny 30.28 N 82.14 W									14.23
5.5 SE Brooksville (FL-HN-5) 28.51 N 82.32 W									14.19
Lamont 7.7 SW (FL-JF-7) 30.29N 83.90W									14.17
Jacksonville 5.6E (FL-DV-43) 30.34N 81.56W									14.12
Hudson 2.5 ENE (FL-PS-38) 28.38N 82.67W									14.11
1.8 WSW Dade City (FL-PS-1) 28.35 N 82.22 W									14.10
Palm Harbor 3.4 ESE (FL-PN-43) 28.07N 82.71W									14.09
0.5 NW Palm Harbor (FL-PN-1) 28.09 N 82.77 W									14.09
4.2 WNW Lutz (FL-HB-5) 28.17 N 82.52 W									14.08
2.8 ESE Dunedin (FL-PN-3) 28.03 N 82.76 W									14.05
Largo (MKYF1) 27.90 N 82.78 W									14.05

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
3 E Arlington 30.34 N 81.56 W									14.02
1 NNW Jacksonville Beach (JCKF1) 30.28 N 81.39 W									13.94
6 S Nassau Village-Ratliff 30.41 N 81.80 W									13.91
Jacksonville 10.4 WNW (FL-DV-55) 30.42N 81.80W									13.91
1 SSW Starke (SRKF1) 29.93 N 82.12 W									13.90
2 NNW Newburn 30.30 N 83.15 W									13.89
Jacksonville 12.0 SSE (FL-DV-51) 30.18N 81.57W									13.83
2 WSW Ortega 30.26 N 81.74 W									13.82
0.4 ENE Greater Northdale (FL-HB-4) 28.11 N 82.51 W									13.82
7.70 SW Lamont 30.29 N 83.90 W									13.75
2.4 SSE Venice (FL-SS-8) 27.06 N 82.42 W									13.75
Jacksonville 11.4 ESE (FL-DV-32) 30.31N 81.47W									13.73
2 WNW San Pablo 30.31 N 81.47 W									13.70
Jacksonville 12.0 SSE (FL-DV-47) 30.17N 81.58W									13.66
Jacksonville 10.0 WSW (FL-DV-33) 30.30N 81.82W									13.65
4 W Normandy 30.30 N 81.82 W									13.65
Chaires Crossroad 2 SSW 30.4N 84.13W									13.50

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
2.4 NW Spring Hill (FL-HN-1) 28.50 N 82.60 W									13.48
4 WNW High Springs 29.84 N 82.65 W									13.38
Fort White 6.4 SE (FL-CB-7) 29.85N 82.65W									13.38
Dade City 1.8 WSW (FL-PS-10) 28.35N 82.22W									13.37
Palm Harbor 0.5 NW (FL-PN-18) 28.09N 82.77W									13.33
Orange Park 4.8 SSW (FL-CY-2) 30.10N 81.74W									13.32
2 SE Doctors Inlet 30.10 N 81.74 W									13.32
Gainesville 8.1 NE (FL-AI-30) 29.74N 82.22W									13.30
Dunedin 2.8 ESE (FL-PN-36) 28.03N 82.76W									13.28
2.2 NNE Brooksville (FL-HN-2) 28.58 N 82.38 W									13.25
4 NE Gainesville Airport 29.74 N 82.23 W									13.24
Whitehouse (KNEN) 30.34 N 81.87 W									13.23
Tarpon Springs Sewage (TRPF1) 28.14 N 82.76 W									13.23
Citrus Park 1.3 ENE (FL-HB-5) 28.08N 82.55W									13.17
Jacksonville 5.9 SW (FL-DV-3) 30.28N 81.73W									13.16
6.5 NNE Tampa (FL-HB-2) 28.03 N 82.41 W									13.15

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
2 WNW University West (FL-HB-4) 28.08 N 82.46 W									13.08
5 W Bushnell (FL-ST-1) 28.68 N 82.20 W									13.05
3 E Spring Hill (FL-HN-7) 28.44 N 82.52 W									13.00
2 NW Fort White 29.94 N 82.74 W									13.00
Oldsmar (OLDF1) 28.04 N 82.67 W									12.96
Micanopy 3.6 SSW (FL-MR-13) 29.45N 82.30W									12.95
3 N Flemington 29.45 N 82.30 W									12.95
1 WNW Ortega 30.28 N 81.73 W									12.93
Venice 2.4 SSE (FL-SS-8) 27.06N 82.42W									12.92
Hopewell Fire Tower 30.38 N 83.44 W									12.76
Monticello 9.8 SW (FL-JF-6) 30.44N 83.99W									12.76
Bushnell 5.0W (FL-ST-17) 28.68N 82.20W									12.73
Dunedin (CCKF1) 28.04 N 82.79 W									12.64
Apalachicola Airport (KAAF) 29.71 N 84.99 W									12.62
2.2 S Clearwater (FL-PN-1) 27.95 N 82.76 W									12.61
4 NW Mayo 30.09 N 83.22 W									12.60
Clearwater 2.2 S (FL-PN-16) 27.95N 82.76W									12.52

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
1 NE Sun City Center (FL-HB-1) 27.73 N 82.34 W									12.51
Neptune Beach 0.5 NNW (FL-DV-13) 30.32 N 81.39 W									12.49
4.3 N Dade City (FL-PS-1) 28.42 N 82.21 W									12.48
1.2 E Brooksville (FL-HN-1) 28.56 N 82.37 W									12.46
0.9 NNW Gulfport (FL-PN-3) 27.76 N 82.72 W									12.45
0.5 WNW Carrollwood (FL-HB-1) 28.05 N 82.50 W									12.45
Wacissa 1 NNE (RRCF1) 27.87N 82.69W									12.40
Pinellas Park (PNBF1) 27.85 N 82.71 W									12.35
Sulphur Springs (RHPF1) 28.01 N 82.26 W									12.35
Tampa Dam (TMTF1) 27.95 N 82.48 W									12.33
Callahan 5.0 SSE (FL-NS-) 30.49N 81.81W									12.33
1 S Nassau Village 30.49 N 81.81 W									12.33
2 SE Gainesville 29.65 N 82.31 W									12.32
1 SSE Arlington 30.32 N 81.60 W									12.30
Tampa 6.5 NNE (FL-HB-29) 28.03N 82.41W									12.28
4 NW Bayard 30.17 N 81.57 W									12.27
1 NNW Bushnell (FL-ST-2) 28.68 N 82.12 W									12.27

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
5 NNE Tampa (FL-HB-5) 28.01 N 82.42 W									12.26
4 W Talbot Island 30.47 N 81.48 W									12.25
6.3 NE North Brooksville (FL-HN-1) 28.64 N 82.34 W									12.25
Gulfport 0.9 NNW (FL-PN-35) 27.76N 82.72W									12.25
Talbot 4 W 30.47M 81.48W									12.25
Appalachee Regional 4 SSE 30.37N 84.14W									12.23
6 WSW Gainesville 29.64 N 82.43 W									12.20
6.1 N Tampa (FL-HB-7) 28.04 N 82.47 W									12.20
Greater Northdale 0.4 ENE (FL-HB-48) 28.11N 82.51W									12.17
Perry/Foley (40J) 30.07N 83.57W									12.07
1.7 SE Carrollwood (FL-HB-2) 28.04 N 82.47 W									12.07
3.2 NE Bloomingdale (FL-HB-4) 27.91 N 82.23 W									12.06
4 W Citra 29.41 N 82.17 W									12.05
9.80 SW Monticello 30.44 N 83.98 W									12.03
1.7 E Citrus Springs (FL-CT-1) 29.00 N 82.45 W									12.02
3.3 ENE Bloomingdale (FL-HB-4) 27.89 N 82.21 W									11.98



Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
5.3 NNE Crystal River (FL-CT-7) 28.97 N 82.56 W									11.98
9.20 W St. Marks 30.15 N 84.36 W									11.89
1.5 E Bay Pines (FL-PN-2) 27.81 N 82.75 W									11.87
1.7 NW Auburndale (FL-PK-7) 28.09 N 81.82 W									11.74
3 S Gainesville 29.63 N 82.33 W									11.68
8 NNE Putnam Hall 29.84 N 81.92 W									11.68
2.2 ESE Largo (FL-PN-1) 27.90 N 82.75 W									11.61
2 S Lake Geneva 29.75 N 82.01 W									11.58
4 ENE Mandarin 30.17 N 81.58 W									11.54
2 NW Cross City 29.65 N 83.15 W									11.52
6 NNE Putnam Hall 29.82 N 81.93 W									11.51
Rerdell (RERF1) 28.34 N 82.09 W									11.42
Dunedin (CRCF1) 28.04 N 82.79 W									11.38
1.20 ENE Madison 30.47 N 83.40 W									11.36
2 E Lutz (FL-HB-3) 28.14 N 82.43 W									11.34
Lamont 30.37 N 83.81 W									11.25
3 W Switzerland 30.08 N 81.69 W									11.24
4.3 S Dade City (FL-PS-2) 28.30 N 82.18 W									11.24
4 NW Bell (BLLF1) 29.79 N 82.92 W									11.23
Foley 30.06 N 83.53 W									11.19

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
1.3 SSE Lutz (FL-HB-2) 28.12 N 82.45 W									11.19
4 NW Newberry 29.67 N 82.67 W									11.16
3 SW High Springs 29.79 N 82.63 W									11.14
1.10 SW Wacissa 30.34 N 84.00 W									11.14
5.1 S Tampa (FL-HB-1) 27.89 N 82.49 W									11.14
4.4 SSW Tampa (FL-HB-3) 27.90 N 82.52 W									11.12
1.5 SSE Land O' Lakes (FL-PS-4) 28.20 N 82.44 W									11.11
3.8 E Brandon (FL-HB-3) 27.93 N 82.23 W									11.11
1 NNE Mandarin 30.16 N 81.64 W									11.08
3.2 NNW St. Petersburg (FL-PN-3) 27.80 N 82.65 W									11.05
2.3 SSE St. Petersburg (FL-PN-9) 27.73 N 82.63 W									11.03
Madison 30.46 N 83.42 W									11.00
3.4 NE Lutz (FL-PS-6) 28.17 N 82.42 W									10.98
Suwannee (SWNF1) 29.19 N 83.06 W									10.93
5.8 SE Sarasota (FL-SS-1) 27.26 N 82.49 W									10.90
2.2 SW Zephyrhills West (FL-PS-2) 28.21 N 82.23 W									10.84
0.8 ESE Bloomingdale (FL-HB-1) 27.87 N 82.25 W									10.84

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
Pinellas Park (SJOF1) 27.85 N 82.71 W									10.78
Alachua 29.80 N 82.41 W									10.78
6.6 E Ellenton (FL-MA-6) 27.54 N 82.42 W									10.77
0.6 E South Pasadena (FL-PN-1) 27.75 N 82.73 W									10.75
Saint Petersburg (KPIE) 27.75 N 82.67 W									10.72
0.3 SE Lakeland Highland (FL-PK-1) 27.96 N 81.95 W									10.70
1.6 WSW Inverness (FL-CT-2) 28.83 N 82.37 W									10.69
2 NNW Mannville 29.65 N 81.87 W									10.67
6 WNW Newberry 29.67 N 82.70 W									10.66
4 NW Trenton 29.65 N 82.86 W									10.66
10 NNE Putnam Hall 29.87 N 81.92 W									10.64
2.1 NE Lutz (FL-HB-2) 28.16 N 82.44 W									10.56
1 NE South Pasadena (FL-PN-6) 27.76 N 82.73 W									10.55
2.3 SSW St. Petersburg (FL-PN-1) 27.73 N 82.66 W									10.53
2.3 NNW Seminole (FL-PN-5) 27.87 N 82.80 W									10.46
4.9 SE Sarasota (FL-SS-2) 27.30 N 82.46 W									10.45
8 N Gainesville Airport 29.80 N 82.28 W									10.43

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
3 NE Florahome 29.75 N 81.84 W									10.40
5 NW St. Petersburg (FL-PN-4) 27.80 N 82.71 W									10.40
8.5 ENE Chiefland (FL-LV-9) 29.50 N 82.72 W									10.36
6 E archer 29.52 n 82.42 w									10.32
4 NNE Florahome 29.78 N 81.85 W									10.29
8.3 NE Madison 30.55 N 83.31 W									10.27
Wimauma (WIMF1) 27.71 N 82.31 W									10.27
4.4 SE Bronson (FL-LV-2) 29.40 N 82.60 W									10.26
Oldsmar (TBFF1) 28.04 N 82.67 W									10.24
4.6 SSE Dade City (FL-PS-2) 28.30 N 82.18 W									10.20
2 NNW Ortega 30.29 N 81.72 W									10.17
2.6 SW Lake Sarasota (FL-SS-3) 27.26 N 82.46 W									10.15
2.4 NW St. Petersburg (FL-PN-3) 27.78 N 82.67 W									10.09
Ocala (OCAF1) 29.16 N 82.08 W									10.07
2.5 SE Telogia 30.32 N 84.79 W									10.06
Morris Bridge (MORF1) 28.05 N 82.19 W									10.03
2 SSW Solivita (FL-PK-2) 28.11 N 81.48 W									10.02
4.7 ESE Crystal River (FL-CT-8) 28.87 N 82.53 W									10.00

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
1.1 S Polk City (FL-PK-2) 28.17 N -81.82 W									9.99
Bradenton (LWDF1) 27.48 N 82.58 W									9.99
Lithia (LITF1) 27.85 N 82.17 W									9.97
3.8 NW Lakeland (FL-PK-3) 28.08 N 82.01 W									9.96
3 WNW Orange Mills 29.69 N 81.63 W									9.93
6.9 SW Lakeland (FL-PK-3) 27.96 N 82.00 W									9.88
7.6 ESE Bloomingdale (FL-HB-3) 27.83 N 82.15 W									9.87
7 NE Archer 29.59 N 82.43 W									9.87
3 W Gainesville 29.68 N 82.38 W									9.80
3.4 NNW Zephyrhills (FL-PS-2) 28.28 N 82.20 W									9.79
6.9 NNE Wildwood (FL-ST-1) 28.95 N 82.01 W									9.76
3 SSW Putnam Hall 29.69 N 81.98 W									9.71
Tampa (ELRF1) 27.95 N 82.48 W									9.68
2 NE Lake Geneva 29.79 N 81.98 W									9.67
6 ESE Archer 29.51 N 82.42 W									9.66
2.6 NNW Zephyrhills (FL-PS-7) 28.27 N 82.19 W									9.65
Pinellas Park (RRCF1) 27.85 N 82.71 W									9.65
6 NNE Archer 29.62 N 82.48 W									9.64

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
1 NW Haines City (FL-PK-2) 28.12 N 81.64 W									9.61
5.2 W Lady Lake (FL-ST-1) 28.94 N 82.01 W									9.60
4.6 NW Lake Wales (FL-PK-3) 27.96 N 81.66 W									9.60
5 ESE Alachua 29.74 N 82.41 W									9.57
3 W Gainesville 29.68 N 82.39 W									9.44
2 NW Gainesville 29.69 N 82.36 W									9.43
Saint Petersburg (KSPG) 27.70 N 82.60 W									9.41
Ashville 30.61 N 83.65 W									9.39
2.2 WSW Sarasota (FL-SS-2) 27.32 N 82.58 W									9.36
1.1 SSE Lakeland (FL-PK-3) 28.03 N 81.95 W									9.36
2 SW Orange Springs (OSPF1) 29.47 N 81.97 W									9.25
2 SSE Summerfield 28.97 N 82.02 W									9.14
0.6 SE Port St. Joe 29.80 N 85.29 W									9.12
1 NW Yellow Jacket 29.47 N 83.01 W									9.09
1.8 ESE Ruskin (FL-HB-4) 27.71 N 82.40 W									9.09
2.5 SE Venice (FL-SS-3) 27.07 N 82.40 W									9.06
1.9 S Plant City (FL-HB-4) 27.98 N 82.13 W									9.05

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
2.7 NNW The Villages (FL-ST-1) 28.90 N 81.97 W									9.04
8.7 SW Lakeland (FL-PK-3) 27.95 N 82.04 W									9.01
5.4 ESE Englewood (FL-CH-1) 26.94 N 82.27 W									9.00
1.5 SE Gibsonton (FL-HB-2) 27.83 N 82.35 W									8.99
2.6 SW Brandon (FL-HB-5) 27.90 N 82.32 W									8.98
2.1 NW Zephyrhills (FL-PS-1) 28.26 N 82.20 W									8.97
7.8 SE Bartow (FL-PK-3) 27.83 N 81.74 W									8.84
2 W Pierson (LGRF1) 29.23 N 81.50 W									8.82
2 WSW Bradenton (FL-MA-1) 27.48 N 82.61 W									8.81
3 SSE Summerfield 28.96 N 82.01 W									8.75
4 S Lake Weir 28.96 N 82.00 W									8.74
4.8 SSE Venice (FL-SS-4) 27.03 N 82.41 W									8.74
7.9 N Tampa (FL-HB-8) 28.06 N 82.48 W									8.72
1.2 W Palmetto (FL-MA-3) 27.52 N 82.60 W									8.68
2.3 N Zephyrhills North (FL-PS-1) 28.28 N 82.16 W									8.63
3.4 E Plant City (FL-HB-1) 28.01 N 82.07 W									8.59

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
0.9 ENE Zephyrhills (FL-PS-8) 28.24 N 82.16 W									8.47
4.6 SW Frostproof (FL-PK-3) 27.70 N 81.59 W									8.44
3 SSW Lake Weir 28.97 N 82.00 W									8.40
Federal Point (HASF1) 29.75 N 81.54 W									8.35
5.1 SSE Venice (FL-SS-3) 27.03 N 82.40 W									8.23
3 ENE Apollo Beach (FL-HB-4) 27.78 N 82.36 W									8.23
5 W Lady Lake (FL-ST-7) 28.92 N 82.01 W									8.21
6.3 ESE Frostproof (FL-PK-4) 27.70 N 81.44 W									8.20
2.1 SSW Brandon (FL-HB-1) 27.90 N 82.31 W									8.11
4 NE Hastings (HTGF1) 29.80 N 81.42 W									8.14
Satsuma 29.55 N 81.66 W									8.10
1 SW Interlachen 29.60 N 81.91 W									8.10
2 SW San Mateo 29.59 N 81.61 W									8.06
2.8 SW The Villages (FL-ST-6) 28.90 N 81.97 W									8.01
2.5 SSW Lady Lake (FL-LK-1) 28.89 N 81.94 W									7.95
Tampa (DLYF1) 27.95 N 82.48 W									7.93
Tampa (NACF1) 27.95 N 82.48 W									7.84



Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
2.7 N Brandon (FL-HB-4) 27.97 N 82.29 W									7.81
Tampa (DLNF1) 27.95 N 82.48 W									7.75
3 SSW Auburndale (FL-PK-1) 28.03 N 81.82 W									7.69
3 NNE Lake Weir 29.06 N 81.97 W									7.68
2.1 NNE Plant City (FL-HB-8) 28.03 N 82.11 W									7.64
St. Augustine Lighthouse (STAF1) 29.88 N 81.29 W									7.62
0.3 NW Dundee (FL-PK-9) 28.02 N 81.62 W									7.55
3.8 SE Venice (FL-SS-3) 27.06 N 82.39 W									7.54
2 NNW Lake Weir 29.04 N 82.00 W									7.54
Lake Weir 29.01 N 82.00 W									7.45
2.2 NE Ellenton (FL-MA-9) 27.55 N 82.50 W									7.44
Winter Haven (KGIF) 28.02 N 81.80 W									7.35
5.3 WNW Lakeland (FL-PK-3) 28.06 N 82.04 W									7.28
Oklawaha 29.01 N 81.97 W									7.19
8.5 NE Sylvan Shores (FL-HL-1) 27.41N 81.25W									7.19
5 SW Astor Park (CRAF1) 29.09 N 81.59W									7.07
2.6 E North Port (FL-SS-3) 27.05 N 82.15 W									7.06

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
1.2 SE Eustis (FL-LK-2) 28.84 N 81.67W									7.00
Lisbon (LSBF1) 28.87 N 81.79W									7.00
3.9 NE Cape Coral (FL-LE-2) 26.70 N 81.93W									6.95
3.6 E Clermont (FL-LK-1) 28.55 N 81.70 W									6.94
3.30 E Port Charlotte (FL-CH-1) 26.9 N 82.06W									6.85
3.9 WNW Lake Placid (FL-HL-1) 27.32N 81.43W									6.82
Punta Gorda (KPGD) 26.93 N 82.06 W									6.80
5 NE Moss Bluff 29.13 N 81.84 W									6.77
4 NE Santos 29.15 N 82.06 W									6.75
Fort Meade (FTMF1) 27.75 N 81.80 W									6.75
Fort Green (FTGF1) 27.62 N 81.95 W									6.74
4 SSE Spuds 29.69 N 81.44 W									6.73
1 W St. Augustine Shores 29.81 N 81.33 W									6.71
2 NNW Englewood (FL-SS-2) 26.99 N 82.37 W									6.68
1 NW High Springs (HGHF1) 29.82 N 82.60 W									6.60
2.5 WNW Englewood (FL-SS-5) 26.97 N 82.39 W									6.48
Lake Wales (LWEF1) 27.90 N 81.59 W									6.31
Pinecastle (KNAE) 29.05 N 81.72 W									6.28

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
7 S Clermont (CLRF1) 28.45 N 81.75 W									6.21
3.1 ENE Frostproof (FL-PK-2) 27.76 N 81.48 W									6.20
2 W Lynne 29.19 N 81.95 W									6.16
2 WNW Eagle Lake 27.99 N 81.79 W									6.10
4 ESE Lake Sarasota (FL-SS-1) 27.26 N 82.38 W									6.07
9.4 SE Lake 27.21 N 81.26 W									6.06
Myakka River State Park (MKCF1) 27.24 N 82.32 W									6.06
Bartow (BARF1) 27.89 N 81.85 W									6.05
1.60 NNW Punta Gorda (FL-CH-1) 26.92 N 82.07 W									5.98
4.7 NNE North Port (FL-SS-1) 27.11 N 82.17 W									5.87
1.1 WSW Lake Placid (FL-HL-3) 27.29 N 81.39 W									5.85
3.8 NE North Fort Myers (FL-LE-1) 26.75 N 81.85 W									5.81
2 NNE Palm Coast (WOGF1) 29.60 N 81.20 W									5.77
6.20 W Port Charlotte (FL-CH-1) 26.98 N 82.21 W									5.74
5.1 WSW Cape Coral (FL-LE-1) 26.56 N 82.03 W									5.72

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
6.9 SSE Clermont (FL-LK-1) 28.45 N 81.72 W									5.72
5.2 SE Bokeelia (FL-LE-2) 26.64 N 82.13 W									5.68
6.4 NNW St. James City (FL-LE-1) 26.59 N 82.11 W									5.65
Crescent City (CREF1) 29.42 N 81.52 W									5.58
2 E Zellwood (PLTF1) 28.72 N 81.57 W									5.54
6.1 SW Winter Garden (FL-OR-2) 28.49 N 81.65 W									5.53
5.7 NW Deland (FL-VL-9) 29.09 N 81.36 W									5.48
5.8 NNE Lake Wales (FL-PK-2) 27.97 N 81.54 W									5.32
5.4 WNW Sebring (FL-HL-2) 27.53 N 81.53 W									5.31
3.1 W Sebring (FL-HL-1) 27.48 N 81.50 W									5.17
North Port (NPRF1) 27.04 N 82.19 W									5.07
<b>Georgia</b>									
<b>ICAO Sites</b>									
Bainbridge (KBGE)	25/2315	1001.7	26/0015	22	30				
Valdosta (KVLD)	26/0753	1001.8	26/2053	17	24				4.99
Valdosta/Moody AFB (KVAD)	26/0750	1001.9	25/2125	17	25				
<b>Public/Other</b>									
2.9 NE Kingsland (GA-CM-4) 30.81 N 81.62 W									12.26

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
3 W Woodbine (GAEMN) 30.96 N 81.77 W									12.16
1 WNW Steven Foster State Park (FFPG1) 30.82 N 82.36 W									11.87
1 E Woodbine (WBNG1) 30.95 N 81.71 W									10.18
4 ESE Hickox 31.12 N 81.93 W									10.11
9 SW Folkston (FLKG1) 30.72 N 82.14 W									9.65
3 WNW Kings Bay Base 30.80 N 81.56 W									9.25
Clyattville 30.69 N 83.32 W									7.90
1 SW St. Simons 31.16 N 81.40 W									6.81
06 NE Nahunta (NAHG1) 31.33 N 81.85 W									6.71
5 ESE Hortense 31.30 N 81.88 W									6.61
Fort Pulaski NOS (FPKG1) 32.033 N 80.901 W						2.76	4.50	1.05	
<b>Alabama</b>									
<b>ICAO Sites</b>									
Mobile Brookley (KBFM)	25/2053	1002.7	25/2053	19	31				
Mobile Regional (KMOB)	25/2056	1003.1	25/2056	24	34				
<b>Marine Observations</b>									
Dauphin Island (DPIA1)	25/2200	1002.3	25/1200	27	30	2.16	2.75	1.78	
Buoy 42012 30.07 N 87.56 W	25/2150	1001.5	25/0350	29	35				
Buoy 42040 29.21 N 88.21 W	25/2050	1001.6	25/0250	31	40				
Mobile State Docks						1.67	2.70	1.38	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) <sup>c</sup>	Storm tide (ft) <sup>d</sup>	Estimated Inundation (ft) <sup>e</sup>	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt) <sup>b</sup>	Gust (kt)				
<b>Mississippi</b>									
<b>Marine Observations</b>									
Bay Waveland Yacht Club (WYCM6)	25/2236	1004.2	25/1918	24	28	2.41	3.50	2.08	
<b>Louisiana</b>									
<b>ICAO Sites</b>									
Boothville (KBVE)	25/1719	1003.7	23/2152	17	22				
<b>Marine Observations</b>									
Pilot Station East SW Pass - NOS (PSTL1)	26/0906	1004.1	22/2230	31	37	2.27		1.87	
Shell Beach (SHBL1) 29.87N 89.67W	25/2248	1005.5	24/1436	21	27	2.68		2.43	
<b>South Carolina</b>									
<b>ICAO Sites</b>									
Springmaid Pier NOS (MROS1) 33.655 N 78.918 W						2.15	3.29	0.85	
Oyster Landing NOS (NIQS1) 33.352 N 79.187 W						3.02	3.54	1.12	
Charleston NOS (CHTS1) 32.78 N 79.93 W						2.41	3.72	1.09	
Clarendon Plantation NOS 32.50 N 80.78W						2.63		0.96	
<b>Offshore buoys/towers</b>									
Tower No. N7 (COAPS) 29.662 N 84.373 W	25/2047	995.5	25/0250	46 <sup>g</sup>					

<sup>a</sup> Date/time is for sustained wind when both sustained and gust are listed.

<sup>b</sup> Except as noted, sustained wind averaging periods for C-MAN and land-based ASOS reports are 2 min; buoy averaging period is 8 min.

<sup>c</sup> Storm surge is water height above normal astronomical tide level.

<sup>d</sup> Storm tide is referenced above North American Vertical Datum of 1988 (NAVD88). Bold numbers indicate that the maximum recorded water level exceeded historical maximum values.

<sup>e</sup> Estimated inundation is the height of water above ground level. For NOS tide gauges, the height of the water above Mean Higher High Water (MHHW) is used as a proxy for inundation.

<sup>f</sup> Wind averaging period 10 min.

<sup>g</sup> Platform height is 30 m.

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Debby, 23-27 June, 2012. Mean errors for the 5-yr period 2007-11 are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL (Debby)	39.8	77.3	127.7	196.0	456.0		
OCD5 (Debby)	47.8	91.1	140.2	194.5	283.4		
Forecasts	14	12	10	8	4		
OFCL (2007-11)	30.4	48.4	65.9	83.1	124.4		
OCD5 (2007-11)	46.9	95.2	151.7	211.6	316.8		

Table 4b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Debby, 23-27 June, 2012. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	34.2	70.1	109.7	175.3	450.6		
OCD5	42.5	94.9	151.3	218.5	<b>323.7</b>		
GFSI	35.0	<b>64.4</b>	<b>105.8</b>	<b>111.3</b>	<b>45.2</b>		
GHMI	55.3	120.1	152.7	182.5	<b>145.9</b>		
HWFI	41.1	91.6	148.3	244.0	675.1		
EGRI	<b>21.9</b>	<b>50.0</b>	<b>94.1</b>	<b>167.5</b>	<b>415.6</b>		
EMXI	<b>28.6</b>	<b>67.7</b>	113.2	<b>171.2</b>	463.5		
CMCI	<b>25.2</b>	<b>42.0</b>	<b>68.5</b>	<b>67.5</b>	<b>157.5</b>		
NAMI	<b>32.8</b>	88.6	157.0	196.5	637.8		
TVCA	<b>32.4</b>	72.2	<b>109.3</b>	<b>152.0</b>	<b>334.7</b>		
FSSE	<b>29.1</b>	<b>58.1</b>	<b>87.9</b>	<b>108.4</b>	<b>304.2</b>		
AEMI	<b>33.5</b>	71.5	<b>103.6</b>	<b>109.4</b>	<b>171.8</b>		
LBAR	<b>28.8</b>	<b>60.4</b>	<b>79.4</b>	<b>124.1</b>	<b>266.8</b>		
BAMS	54.1	120.6	199.9	248.7	<b>357.5</b>		
BAMM	41.9	95.6	163.4	210.5	<b>399.2</b>		
BAMD	40.3	<b>69.7</b>	124.7	198.1	<b>223.8</b>		
Forecasts	10	9	7	6	2		



Table 5a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Debby, 23-27 June, 2012. Mean errors for the 5-yr period 2007-11 are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL (Debby)	<b>3.6</b>	<b>6.3</b>	<b>11.5</b>	19.4	31.3		
OCD5 (Debby)	5.0	5.7	8.6	7.4	7.0		
Forecasts	14	12	10	8	4		
OFCL (2007-11)	7.1	10.8	13.0	15.0	16.9		
OCD5 (2007-11)	8.4	12.4	15.4	17.7	20.5		

Table 5b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Debby, 23-27 June 2012. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 5a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	3.8	6.3	11.5	19.4	31.3		
OCD5	5.2	<b>5.7</b>	<b>8.6</b>	<b>7.4</b>	<b>7.0</b>		
HWFI	6.2	<b>6.1</b>	<b>6.5</b>	<b>10.8</b>	<b>26.5</b>		
GHMI	7.5	<b>6.0</b>	<b>7.1</b>	<b>10.5</b>	<b>3.3</b>		
DSHP	4.9	7.9	<b>11.2</b>	<b>14.1</b>	<b>23.0</b>		
LGEM	4.8	8.5	12.1	<b>16.4</b>	<b>25.5</b>		
ICON	5.6	6.8	<b>7.5</b>	<b>11.0</b>	<b>19.5</b>		
IVCN	5.6	6.8	<b>7.5</b>	<b>11.0</b>	<b>19.5</b>		
FSSE	5.3	6.5	<b>7.1</b>	<b>10.5</b>	<b>17.5</b>		
Forecasts	13	12	10	8	4		

Table 6. Watch and warning summary for Tropical Storm Debby, 23-27 June 2012.

Date/Time (UTC)	Action	Location
23 / 2100	Tropical Storm Warning issued	Pearl River to Morgan City, LA
24 / 1200	Tropical Storm Warning issued	Alabama/Mississippi border to the Ochlocknee River, FL
24 / 1500	Tropical Storm Watch issued	Suwannee River to Anclote Key, FL
24 / 2100	Tropical Storm Watch modified to	Suwannee River to Englewood, FL
24 / 2100	Tropical Storm Warning discontinued	Pearl River to Morgan City, LA
25 / 0900	Tropical Storm Warning modified to	Alabama/Florida border to the Suwanee River, FL
25 / 1500	Tropical Storm Watch discontinued	All
25 / 1500	Tropical Storm Warning discontinued	Alabama/Florida border to Destin, FL
25 / 1500	Tropical Storm Warning issued	Destin, FL to Englewood, FL
26 / 0300	Tropical Storm Warning modified to	Mexico Beach, FL to Englewood, FL
26 / 2100	Tropical Storm Warning modified to	Steinhatchee, FL to Englewood, FL
27 / 0000	Tropical Storm Warning discontinued	All

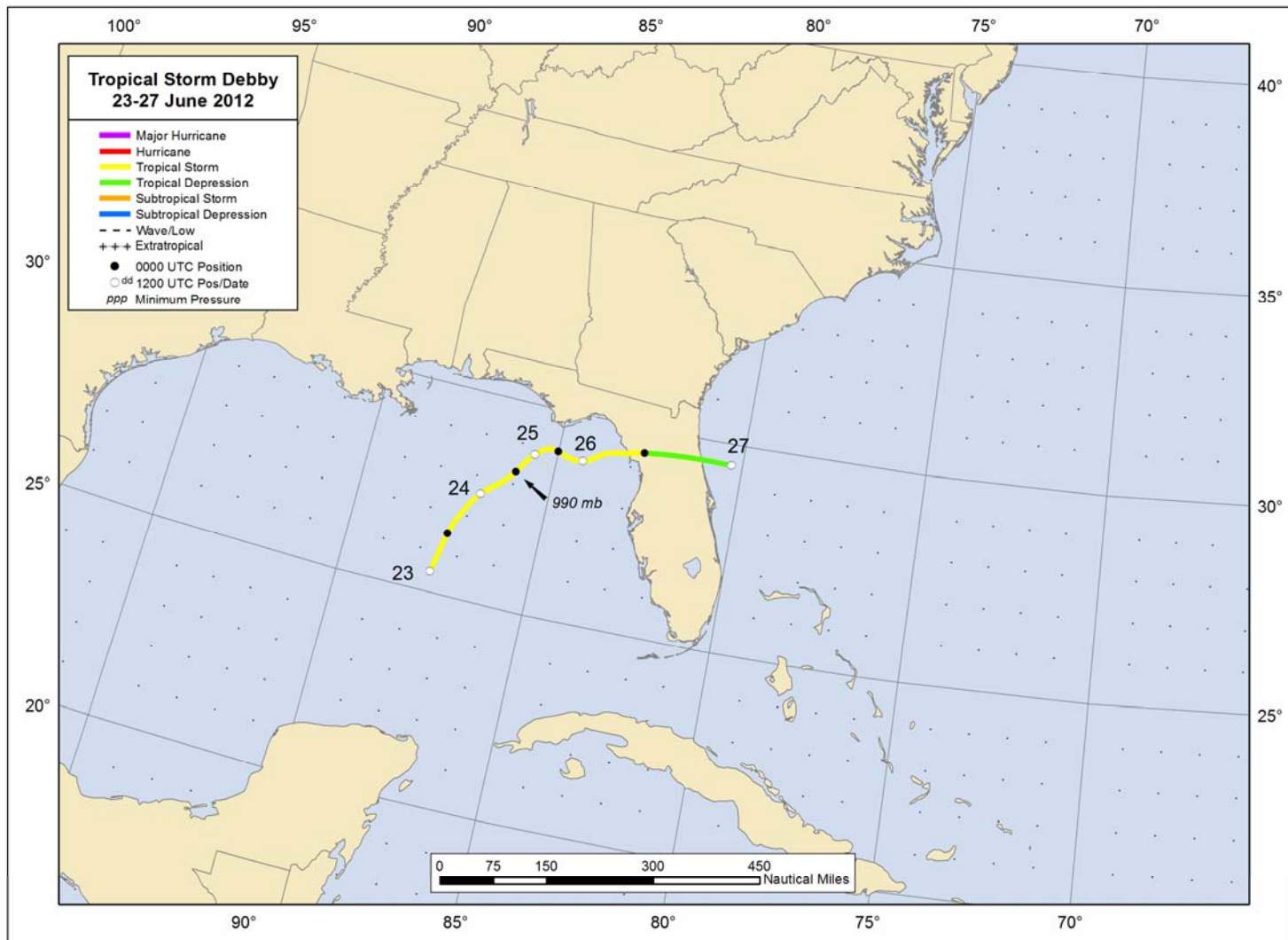


Figure 1. Best track positions for Tropical Storm Debby, 23-27 June.



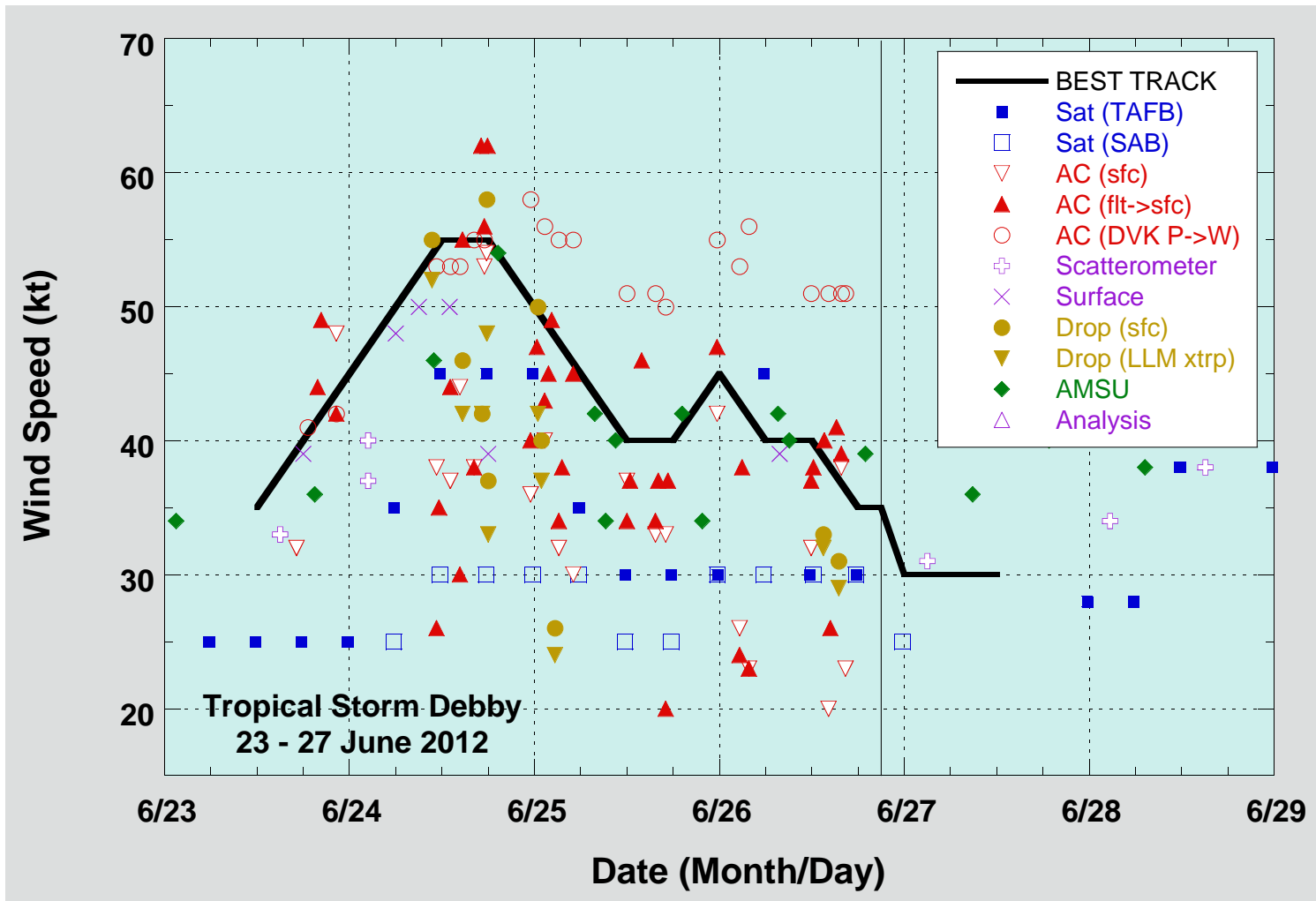


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Debby, 23-27 June 2012. Aircraft observations have been adjusted for elevation using 90%, 80%, and 80% adjustment factors for observations from 700 mb, 850 mb, and 1500 ft, respectively. Dropwindsonde observations include actual 10 m winds (sfc), as well as surface estimates derived from the mean wind over the lowest 150 m of the wind sounding (LLM). AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC. The solid vertical line corresponds to landfall near Steinhatchee, Florida.

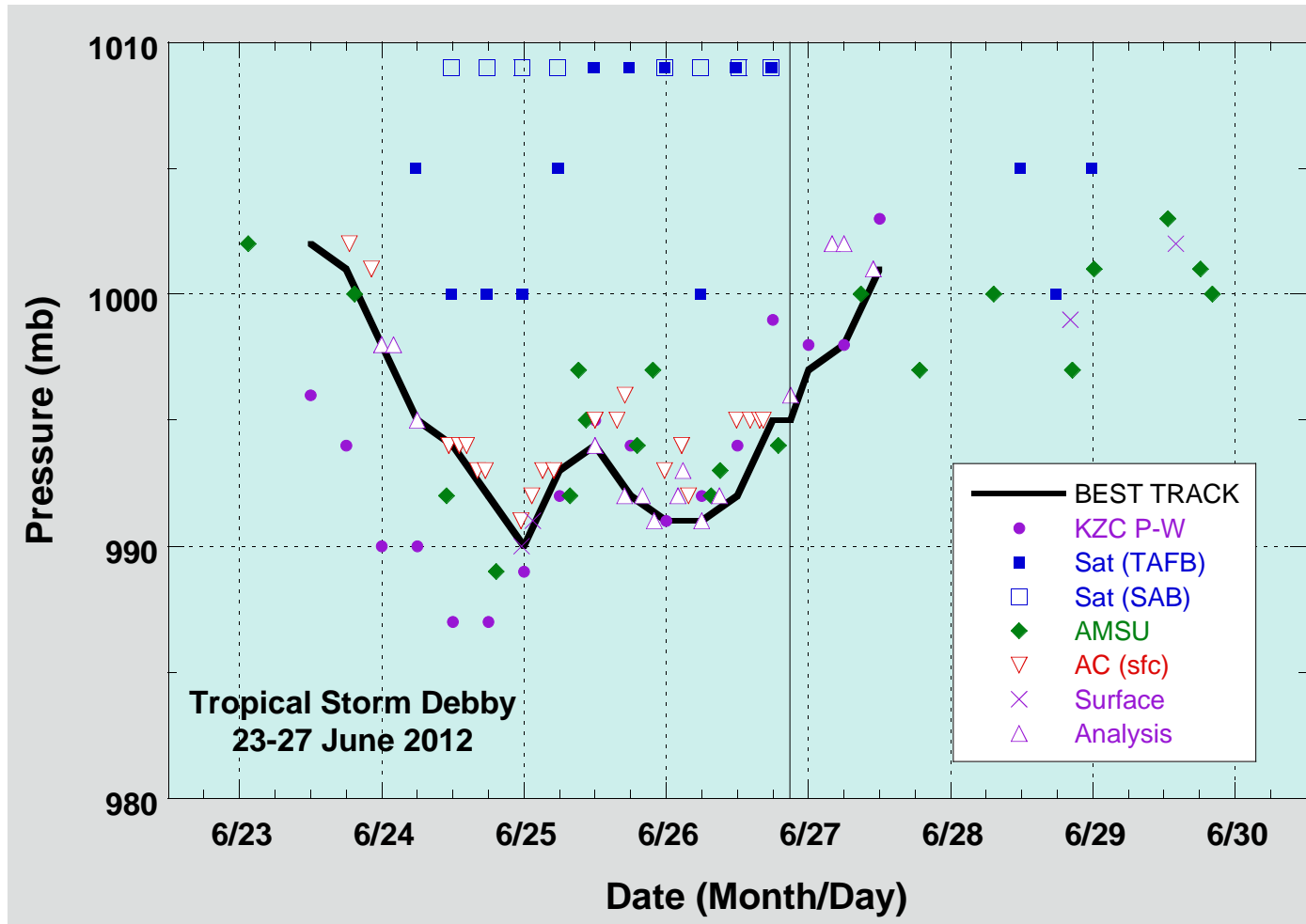


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Debby, 23-27 June 2012. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. The KZC P-W values are obtained by applying the Knaff-Zehr-Courtney pressure-wind relationship to the best track wind data. Dashed vertical lines correspond to 0000 UTC. The solid vertical line corresponds to landfall near Steinhatchee, Florida.

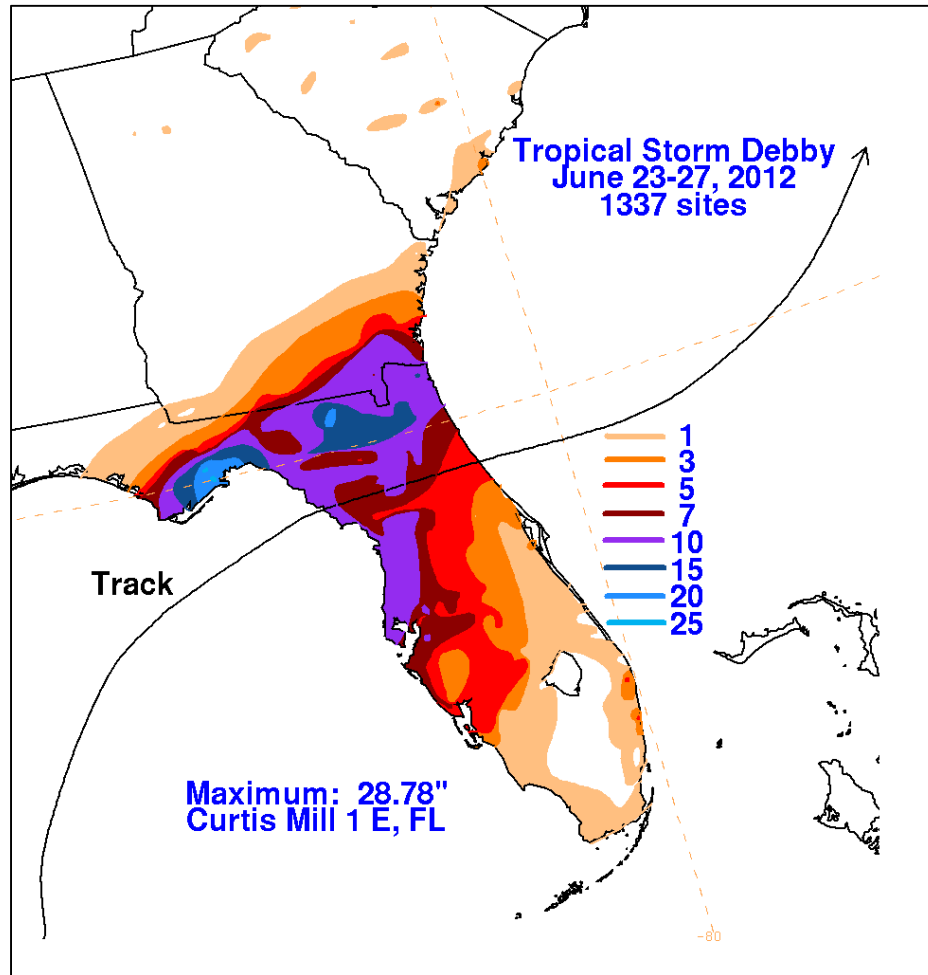


Figure 4. Rainfall totals associated with Tropical Storm Debby, 23-27 June, 2012. This map was produced by the NOAA Hydrometeorological Prediction Center.



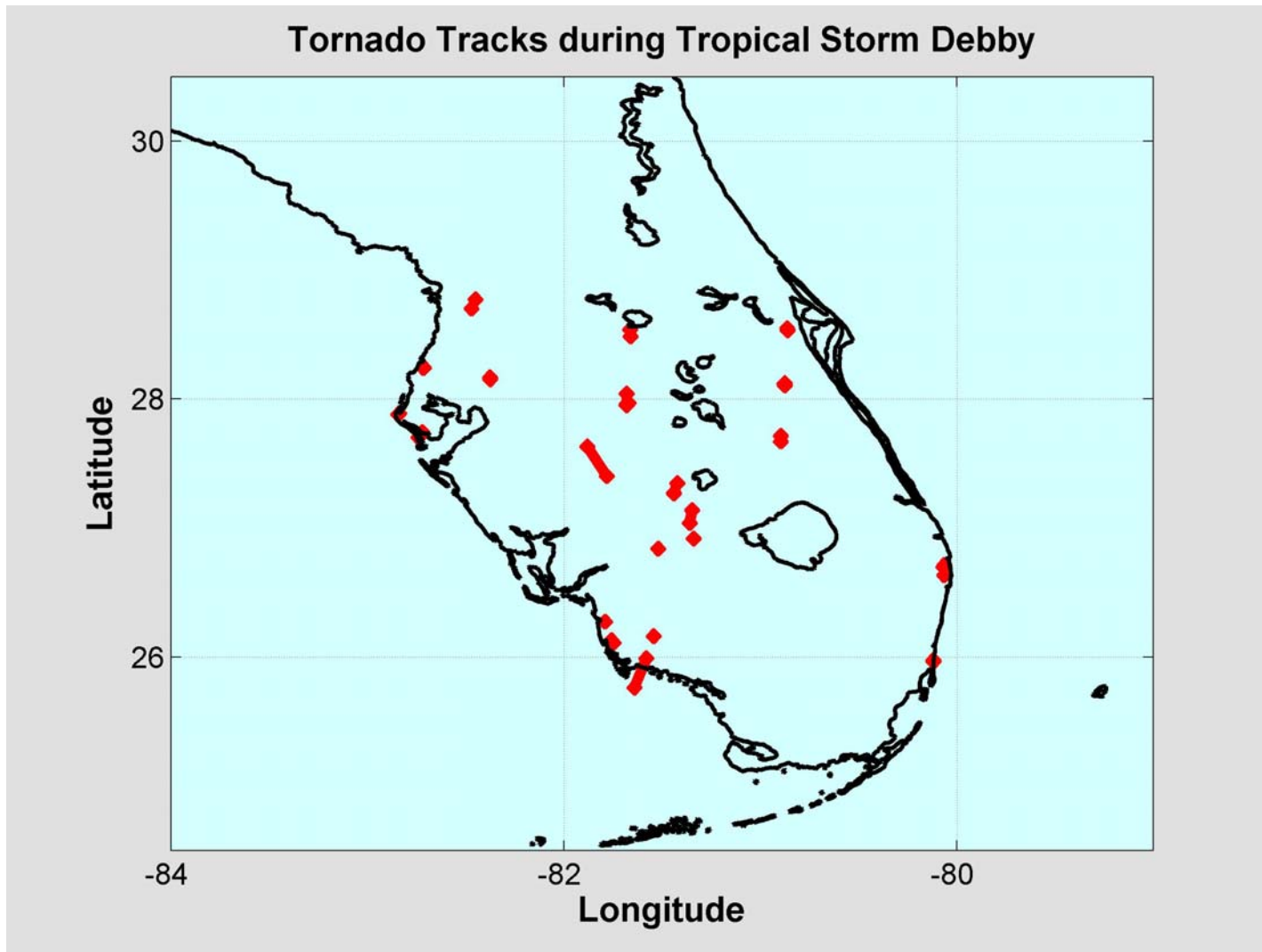


Figure 5. Tornadoes during Tropical Storm Debby over Florida, 23-24 June 2012. Data courtesy of the Storms Prediction Center in Norman, OK.

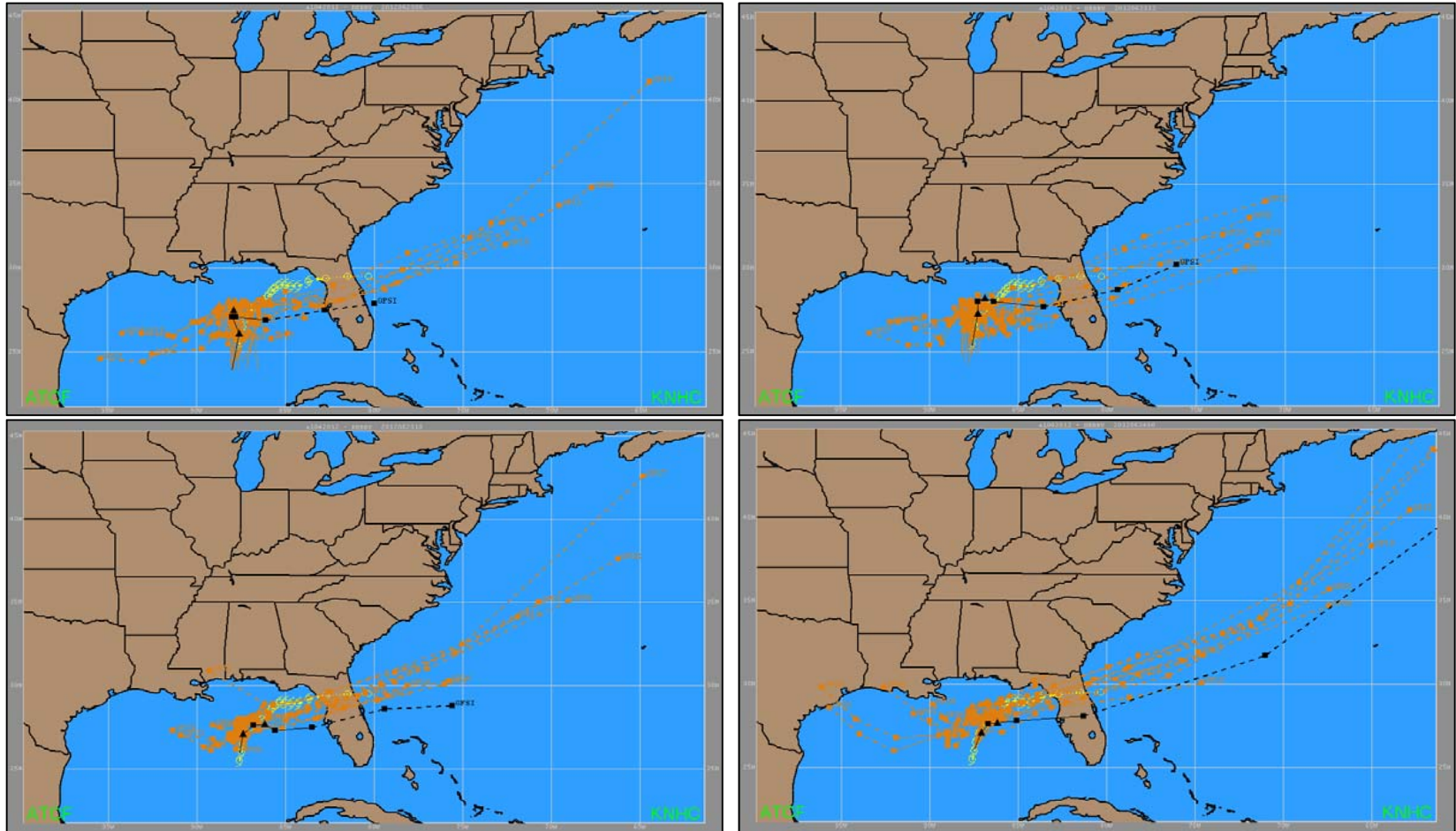


Figure 6. Global Forecast System (GFS) control and GEFS ensemble track forecasts for Debby at 0600 UTC 23 June (top left), 1200 UTC (top right), 1800 UTC (lower left), and 0000 UTC 24 June (lower right). Ensemble members are given in dashed orange lines through 72 h and dotted orange lines from 72 h to 120 h. The control run of the GFS is given as the dashed black line, while the best track is given by the dashed white line with positions given at 6 h intervals.

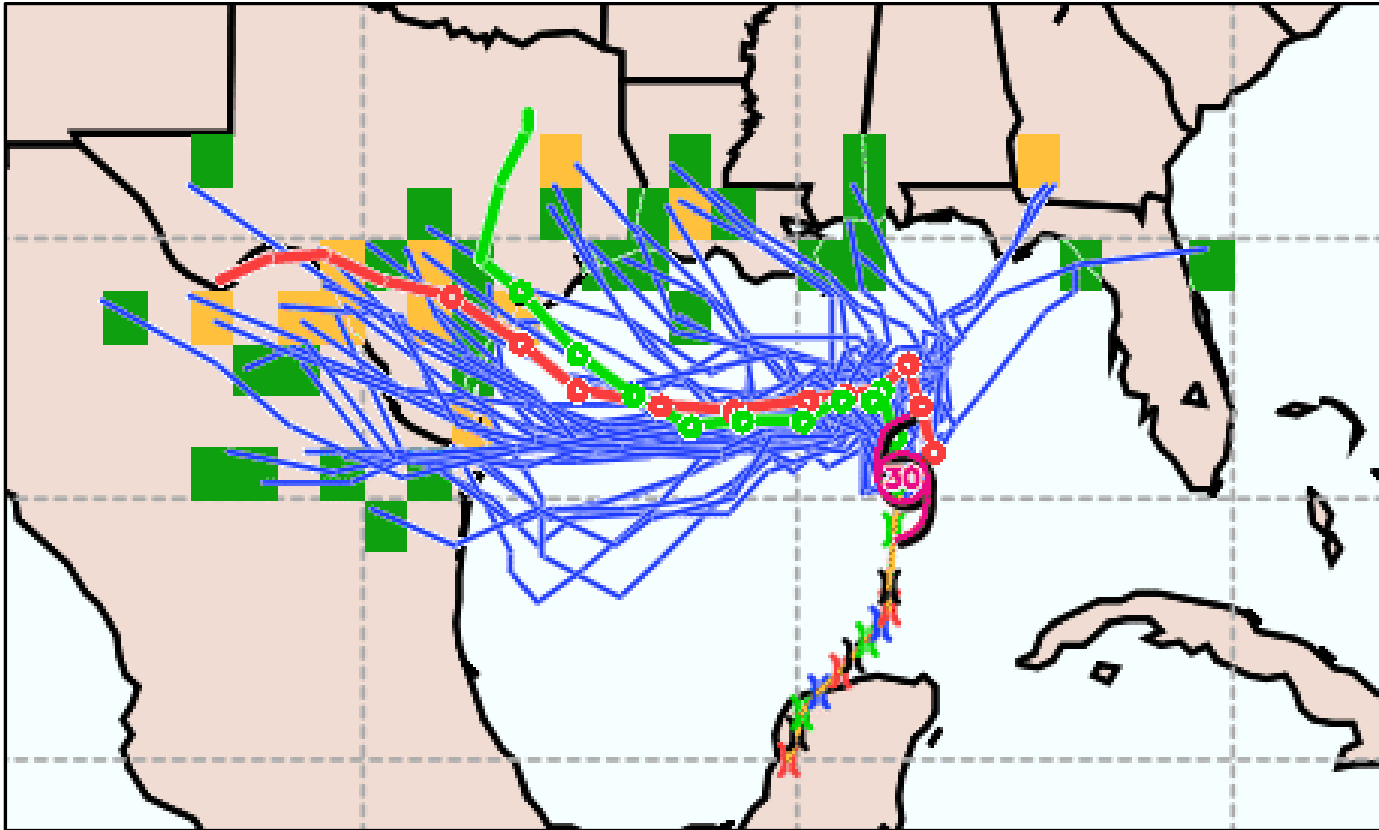


Figure 7. European Centre for Medium-Range Forecasting (ECMWF) track forecasts for Tropical Storm Debby at 1200 UTC 23 June. ECMWF ensemble members are given as solid blue lines. The control run of the ECMWF is given as a solid red line.