

## Hurricane Wilma Preliminary Storm Survey

Disclaimer: Hurricane Wilma track and intensity information from our surveys are preliminary. Final official intensity and track will be determined by the National Hurricane Center.

### Category 3 Wilma Strikes Extreme Southern Florida Impacts are Mainly Minor for the Suncoast



NOAA satellite picture of Hurricane Wilma near peak intensity (882 mb) over the northwestern Caribbean Sea, October 19, 2005, at 1315 UTC (915 AM EDT). The pressure in the very small eye (about 5 miles wide) was the lowest ever recorded in the Atlantic Basin.

**Intensification Stage**

**Acceleration, Re-Intensification...*(continued)***

**W**ilma began as a disorganized mass of showers and thunderstorms over the western Caribbean sea, during the second week of October. On the 15th, a depression formed about 85 miles southwest of Montego Bay, Jamaica. Initial development was slow, as dry air pressing down from the north inhibited growth for the next day and a half, despite low shear and very high upper oceanic heat content. As the storm drifted south, however, the dry air became less of a factor, and early on the 17th Tropical Storm Wilma was born. Still rather disorganized, Wilma underwent slow intensification through 18th, reaching minimal hurricane strength by late morning. Rapid intensification began soon after.

**A**t this point, banded features had consolidated toward the center, and a core of convection began to intensify rapidly. Aircraft reconnaissance reported a pressure drop of 16 mb in less than 4 hours, and just before 0000 UTC on the 19th (8 PM EDT on the 18th), the reported pressure was 954 mb. Soon after, a "pinhole eye" developed, as noted by an NHC forecast discussion at 0300 UTC on the 19th (11 PM EDT on the 18th). Soon after, cloud tops around this eye cooled to -88°C! By 0600 UTC, the central pressure dropped to 901 mb, and by daybreak the pressure bottomed out at 882 mb, an amazing 72 mb drop in about 12 hours! This value was now the lowest observed on record. The following table shows the top five Atlantic Basin hurricanes ranked by lowest

**A** weakening trend which had continued as Wilma eased off of the Yucatan peninsula reversed once the entire circulation was over the southeast Gulf. Wilma continued on a northeast track, headed for landfall along the lower southwest Florida coast south of Naples. At this point, it became clear that the Suncoast would be largely spared of Wilma's effects.

**U**nfortunately, the opposite was true for all of South Florida. The worst case wind scenario - a rapidly accelerating, gradually strengthening hurricane with increasing girth - unfolded for one of the more populated strips of land in the U.S. The eye of Wilma raced ashore near Cape Romano (southern Collier County) at 25 mph at around 1130 UTC (730 AM EDT), carrying minimal category 3 sustained winds (111 mph) with gusts approaching category 4 strength (131 mph). Though a large surge was confined to the largely unpopulated Everglades and Big Cypress Preserve, the increasing winds on the southern and eastern periphery affected Miami-Dade, Broward, and Palm Beach Counties, causing extensive, and in some cases, devastating damage. There were at least six confirmed [direct deaths](#) in extreme south Florida. Power was lost to at least 3.5 million customers, the most for any single storm in 2005. Damage estimates are still being tallied; total losses will likely rival those for Hurricane Andrew. Though Andrew was a stronger storm, its effects were felt in a much smaller area.

central pressure.

Rank	Storm	Pressure	Year
1	Wilma	882 mb	2005
2	Gilbert	888 mb	1988
3	Labor Day	892 mb	1935
4	Rita	897 mb	2005
5	Allen	899 mb	1980

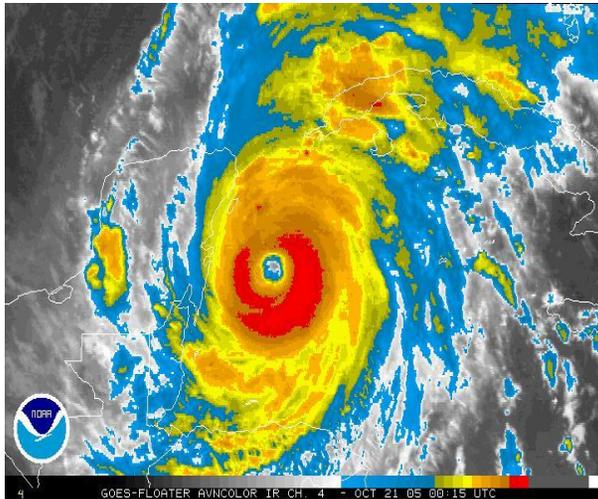
### Eyewall Replacement/1st Landfall

Storms this strong and tightly wound (at the time of lowest pressure, the radius of hurricane force winds was only a little more than 15 miles) do not hold such intensity for long, and Wilma was no exception. However, the storm was incredibly well organized, and had a large outer radius of tropical storm force winds. The inner energy soon radiated outward, increasing the field of hurricane force winds and starting a series of eyewall replacements. The small eyewall began collapsing later on the 19th, and was replaced by a more formidable 40 mile wide eye by mid afternoon on the 20th. Though central pressure rose to an estimated 915 mb, the core of hurricane force winds now extended out to about 85 miles. During this time, Wilma was churning slowly toward the Yucatán Channel.



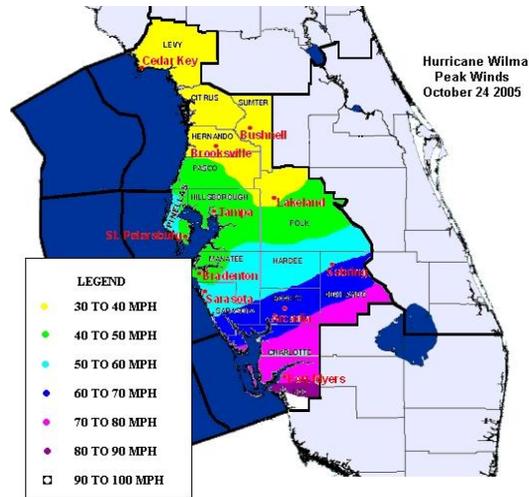
### Effects on West Central and Southwest Florida

Wilma merged with the season's first true cold front to intensify the gradient between the onrushing polar high pressure system and the large storm. Hurricane force wind gusts were felt in Lee County, where the most extensive damage was seen. At the peak of the storm, power was out to about 208,000 customers in Lee County alone. Damage was widespread, but relatively minor for most. Property damage included moderate to major structural problems at mobile homes and aluminum-sided structures (top of page), as well as pool cages and the like, in the south portion of the county. In addition, there were hundreds of uprooted/fallen trees, some onto residences and vehicles. Farther north, problems were much less notable, more consistent with a typical strong to marginally severe thunderstorm, including minor



Now a category 4 storm, Wilma was more formidable (Figure 1, above). First, the expanded core of hurricane force winds was now able to raise very high seas in the northwestern Caribbean - as high as 36 feet at one NOAA Buoy east of the Yucatán peninsula. Second, the system was moving slowly northward, toward the major resorts of Cozumel and Cancún, Mexico. Through the afternoon and evening of the 20th, Wilma slowly approached Cozumel, and conditions gradually deteriorated. By daybreak on the 21st, conditions quickly deteriorated across Quintana Roo province of the eastern Yucatán peninsula. Cozumel was raked by the northern eyewall for the entire morning and early afternoon, causing extensive and in some cases devastating damage. As the large center passed over the island, the eyewall headed for Cancún.

damage to poorly constructed structures and mobile homes, and scattered tree, limb, and power line damage. The map below shows observed wind gust values across west central and southwest Florida.



Storm surge was not a factor. Rather, as expected with the strong northerly winds, tide departures became negative, as shown on the tide charts for [Old Port Tampa](#) and [Fort Myers Beach](#). Locally heavy rains created areas of urban flooding in Lee County. For most other areas, the rains were a welcome sight for many areas which experienced a dry end to the rainy season. In fact, the widespread [rains](#) from the Tampa Bay area south ensured that October would be above normal in these areas. The exception was across the Nature Coast, where dry air associated with the cold front raced into the backside of the storm, greatly

**Wilma** slowed to a northward motion of 3 mph as she eased along the eastern Yucatán peninsula. The storm made landfall between Cozumel and Cancún at Playa del Carmen around 0600 UTC (2 AM EDT) on the 22nd as a Category 4 storm with estimated winds up to 135 mph and a central pressure of 934 mb. Wilma gradually weakened to a Category 2 (100 mph winds) while the eye moved over land. However, the eastern eyewall remained largely over water, precluding additional weakening.

### **Acceleration, Re-Intensification, and 2nd Landfall**

After leaving extensive damage across the northeast Yucatán, Wilma moved off the coast just before 0000 UTC on the 23rd (8 PM EDT on the 22nd) and soon began turning northeast. Her core intact, and with a movement aided by increasing southwesterly flow aloft with relatively little shear, the cyclone was able to slowly regain some intensity while accelerating across the still warm waters of the southeast Gulf on the 23rd. Initially moving at 3 mph just after 0500 UTC (1 AM EDT), Wilma began accelerating soon after, reaching 8 mph by 1200 UTC (8 AM EDT) and 14 mph by 1500 UTC (11 AM EDT).

reducing storm totals. Since the rains were welcome in many areas, the majority of area rivers were able to handle the excess runoff. However, a band of intense thunderstorms, which dumped an additional 3 to 5 inches over extreme eastern Hillsborough and western Polk counties during the evening of the 23rd, aided rapid rises on the Alafia and Peace Rivers. The table below shows the flood and caution crests for affected rivers.

River and Station	Fld./Cau. Stage	Peak Crest	
		Stage (Ft)	Date
Peace R. at Arcadia	11	11.90	Oct 27/6:30 ET
Alafia at Lithia	13	14.56	Oct 26/10:45 ET
Horse Cr. near Arcadia	12 (F), 10 (C)	10.14	Oct 26/9:00 ET
Manatee R. near Myakka Head	11 (F), 9.5 (C)	10.48	Oct 25/14:45 ET