

FACT SHEET
Double Eyewalls and Hurricane Katrina

Double Eyewalls

- Conventional **single** eyewall hurricanes generally have their strongest winds within 25 miles of the storm center.
 - Severe wind damage may occur over a coastal strip up to 50 miles wide.
- **Double** eyewall hurricanes may inflict severe wind damage over a much broader coastal strip.
 - These hurricanes have an outer eyewall that can spread some of their strongest winds over a path up to 100 miles wide.
 - In Katrina, virtually the entire Mississippi Coast received strong eyewall winds.
 - Winds impacted a broad area, spreading destruction over 100 miles north of the coast to inland cities such as Hattiesburg, Meridian and Jackson MS.
- Approximately 70% of the Atlantic and 50% of the East Pacific intense storms reached concentric or double eyewall status between 1997 and 2005.
 - Five separate storms developed double eyewalls in 2005 (Dennis, Emily, Katrina, Rita, and Wilma). All but Dennis reached Category 5 intensity (Dennis was a strong 4).

Hurricane Forces

- Highest wind speeds are recorded in the eyewall.
- Typically, hurricane gusts are about **1.3 times** the sustained wind speed over coastal locations.
- **Convective** gusts may reach 2 times sustained speeds.
- Maximum winds in the hurricane are found closer to the ground in the eyewall than in the outer vortex of the storm, with maximum eyewall speeds at about 400-600 meters above ground.
- Heavy rainfall can transport these strong winds down near the ground.
- Microwave satellite imagery provides an important tool for identifying eyewalls and their accompanying intense surface winds.
- Storm surge flooding is the greatest killer in a hurricane.
- Inland flooding from heavy rainfall is also a significant threat.

Hurricane Katrina

- At landfall (Plaquemines, LA), the eye of Katrina had the **third lowest air pressure ever recorded** in the US – 920 millibars. How low the air pressure is inside the eye is usually an indicator of the strength of a hurricane, but maximum wind speeds can vary significantly between storms of similar pressure.
- Before landfall, Katrina was a Category 5 storm with air pressure in the eye of 902 millibars, and sustained winds of 175 mph. Katrina was a single-eyewall storm at this time.
- Katrina was a **double-eyewall storm when it hit the Louisiana and Mississippi coasts.**
- The hurricane made landfall as a Category 3 storm, with sustained winds of about 120 mph. It had extremely high 1-3 second wind gusts far in excess of the sustained winds.
- The hurricane's highest **reported surface gust** was 135 mph, in Poplarville, Mississippi; many weather stations were destroyed, so Katrina's highest gusts were not measured.

- Video evidence from storm chasers suggests gusts on the ground in Gulfport, MS, could have been as high as 150 mph.
- Winds from the outer eyewall hit the Mississippi coast up to 4 hours **before** the storm surge reached its peak during the landfall of the inner eyewall.
- The hurricane spawned 22 documented **tornadoes** in Mississippi and Alabama.
- The highest storm surge was 28 feet, at Pass Christian, Mississippi, a product of the storm's huge size.