

HOLBORN PERSPECTIVES

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LOOKING CLOSER AT...

# **The 2008 Hurricane Season**

December 1, 2008

**HOLBORN**

## The 2008 Hurricane Season

Hurricane Ike was the second largest U.S. natural catastrophe loss in nominal dollars and the sixth biggest loss relative to the size of the current economy. Holborn estimates that Ike caused roughly \$20Bn of direct insured loss, including \$4Bn of Energy and \$1.5Bn of LAE, with \$6Bn of that amount reinsured. Passing over Houston, with a regional population of four million, Ike was the first time a major U.S. city had been exposed to hurricane-force winds. Gustav was also a significant loss, at roughly \$7Bn gross.

### Record U.S. hurricanes

Rank	By Nominal Dollars			By Economic Impact			By Fatalities		
	Storm	Year	Amount	Storm	Year	% of GDP	Storm	Year	Number
1	Katrina	2005	\$60Bn	Katrina	2005	0.48%	Galveston	1900	8,000
2	Ike	2008	\$18Bn - \$22Bn	Andrew	1992	0.24%	Okeechobee	1928	2,500+
3	Andrew	1992	\$16Bn	Betsy	1965	0.19%	Katrina	2005	1,833
4	Wilma	2005	\$12.5Bn - \$15Bn	Camille	1969	0.14%	SC/Georgia	1893	1,000 - 2,000
5	Charley	2004	\$12.5Bn	Ike	2008	0.12% - 0.15%	Louisiana	1893	1,100+
6	Ivan	2004	\$10Bn	Hugo	1989	0.12%	New England	1938	720
7	Rita	2005	\$10Bn	Charley	2004	0.11%	SC/Georgia	1881	700
8	Frances	2004	\$7.5Bn	Wilma	2005	0.10% - 0.12%	Labor Day	1935	405
9	Gustav	2008	\$6Bn - \$8Bn	Ivan	2004	0.09%	Louisiana	1856	400
10	Hugo	1989	\$7Bn	Rita	2005	0.09%	Audrey	1957	390

Note: Loss amounts include LAE and off-shore exposures. Fatalities are U.S. mainland only, as reported by NHC, except for 1938 which includes flood victims inland.

The total number of named storms was just below the long-term average of 17. However, the number of storm days and the number of major hurricanes were both above average. The increase may partly be due to better monitoring technology and the National Hurricane Center upgrading storms earlier.

2008 was the third highest year for U.S. insured hurricane loss, after only the 2005 (Katrina) and 2004 (four storms in Florida) seasons.

**2008 Season summary**

Totals	Actual	Colorado State May 31 Projection	Colorado State August 5 Revision	1950 - 2007 Average	% Above Average
Named Storms	16	15	13	17	-6%
Hurricanes	8	8	7	9	-11%
Major Hurricanes: 3+	5	4	6	2	+150%
Named Storm days	85	80	90	49	+73%

Source: Professors Gray and Klotzbach, CSU

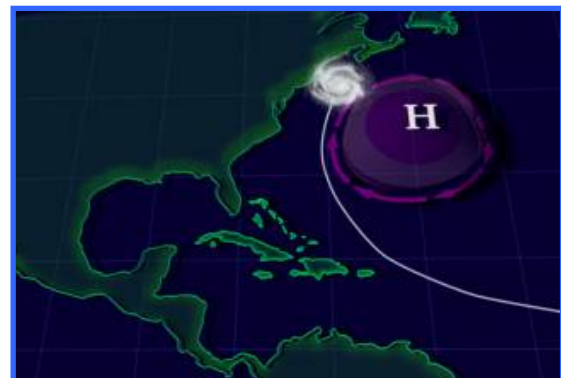
The active U.S. season was driven by several factors, including:

- Atlantic water temperatures moderately higher than average.
- A moderate La Niña, a pattern of cool water in the eastern Pacific associated with higher storm frequency.
- A reduced number of Saharan dust clouds over the Atlantic Ocean relative to 2007. These clouds stabilize the air masses entering from Africa’s western coast, and limit storm development.
- A western location for the Bermuda High during much of the season steered many of the storms toward the Gulf. Seasons in which the Bermuda high expands to the south and west tend to have more U.S. landfalling storms, as shown in the conceptual maps below.

**Bermuda High in 2004 and 2005**



**Bermuda High in 2006 and 2007**



Source: NASA, Goddard Space Flight Center

2008 tracks were similar to 2004 and 2005, with more U.S. landfalling storms, six vs. four total in 2006 and 2007 combined.

**2008 Atlantic and Caribbean storms**



### Seasons compared

	Named Storms	Hurricanes	Major Hurricanes	U.S. Landfalls	U.S. Gross Insured Loss	Deaths
2004	13	9	5	8	\$35Bn	5,000+
2005	27	15	7	9	\$85Bn	3,500+
2006	9	5	2	0	< \$250Mn	25
2007	15	6	2	4	< \$250Mn	250
2008	16	8	5	9	>\$30Bn	1,000+

Notes: Deaths include persons outside of the U.S. and exclude death not directly related to the storm perils.

### 2008 Storm details

Storm	Highest Category	Dates	Maximum Winds (mph)	Minimum Pressure (mB)	Location(s) of Landfall	Deaths
Arthur	TS	May 31st to June 1st	40	1005	Northeastern Belize and Chetumal, Mexico	5
Bertha	3	July 3rd to July 20th	120	948	None	0
Cristobal	TS	July 19th to July 23rd	65	1000	Eye never made landfall, although the inner rain bands passed over Charleston, SC	0
Dolly	2	July 20th to July 24th	100	964	Yucatan Peninsula and South Padre Island, TX	21
Edouard	TS	August 3rd to 5th	65	997	East Texas	0
Fay	TS	August 15th to August 24th	65	986	Puerto Rico, Haiti Cuba and Florida (4 times)	25
Gustav	4	August 25th to September 2nd	150	941	Haiti, Jamaica, Cayman Islands, Cuba and Western Louisiana	125+
Hanna	1	August 28th to September 7th	80	978	Turks & Caicos, Haiti and NC / SC Border	500+
Ike	4	September 1st to 14th	145	935	Turks & Caicos, Bahamas, Haiti, and Texas	80+ U.S., "Several hundred" in Caribbean
Josephine	TS	September 2nd to 5th	65	994	None	0
Kyle	2	September 25th to 29th	80	984	Nova Scotia	4
Laura	TS	September 29th to Oct 1st	60	994	None	0
Marco	TS	October 6th to 7th	65	998	S.E. Mexico	0
Nana	TS	October 12th to 13th	40	1005	None	0
Omar	3	October 14th to 18th	135	959	None	0
Paloma	4	November 6th to 9th	145	943	Cuba	NA

### **Outlook for the 2009 Season**

Global temperatures have stabilized in the last two years. However, the Atlantic storm frequency is still in a relatively more active phase of its long-term (multi-decade) cycle. The current phase of the shorter-term El Niño cycle is neutral, with early signs of resuming the “La Niña” phase (cool in the eastern pacific). La Niñas are related to both more total storms and more U.S. landfalls, so that would suggest a similar level of storm activity next year. The nature of the Bermuda high and Saharan dust clouds are not predictable very far in advance, so any 2009 estimates are rather speculative. Overall, we expect the next several years to remain more active than the 1990’s.

Recent estimates by Dr. Gray’s team at Colorado State have remained above long-term averages. They estimate a 60% chance of a category 3 or higher landfall in the U.S.

The number and value of U.S. coastally-exposed properties has risen for several decades. While the slump in housing prices reduces both new construction and replacement costs, insured values remain much higher than they were a decade or more ago, so losses can be much higher than from comparable events in the past. Although this is partly offset by Wind deductibles which are now much more common.

The involuntary markets have been growing in most coastal states since the 2004 and 2005 storm seasons and resulting hard property market. They continue to grow, especially in Florida and the Gulf states. Exposures to assessments are growing faster than voluntary business for most insurers.

## Appendices

- A. *Details on 2008 Storms*
- B. *Seasons Compared*
- C. *Previous Hurricane Seasons*
- D. *For More Information*

### A. *Details on 2008 Storms*

#### **Tropical Storm Arthur**

**Maximum sustained winds:** 40 mph

**Dates:** May 31<sup>st</sup> to June 1<sup>st</sup>

**Lowest recorded pressure:** 1005 mB

**Direct Fatalities:** 5

#### **Notes:**

- Initial development was quick
- Made landfall in northeastern Belize as a tropical storm between Belize City and Chetumal, Mexico.
- 714 homes damaged
- 15 inches of rain were reported

## **Hurricane Bertha**

**Maximum sustained winds:** 120 mph

**Dates:** July 3<sup>rd</sup> to July 20<sup>th</sup>

**Lowest recorded pressure:** 948 mB

**Direct Fatalities:** 0

### **Notes:**

- The longest-lived July Atlantic tropical cyclone on record.
- Developed from a tropical wave that emerged off the coast of Africa.
- Bertha continued to strengthen and became the first hurricane of the season on July 7
- The system moved within 40 miles of Bermuda on July 14
- Third strongest July storm on record

## **Tropical Storm Cristobal**

**Maximum sustained winds:** 65 mph

**Dates:** July 19<sup>th</sup> to July 23<sup>rd</sup>

**Lowest recorded pressure:** 1000 mB

**Direct Fatalities:** 0

### **Notes:**

- Affected Florida, the Carolinas and Atlantic Canada
- Brought 6 inches of rain to Florida in just a few hours
- Reached tropical depression status late July 18, about 65 miles southeast of Charleston, South Carolina, named a tropical storm shortly after
- Moved north northeast along the east coast, never actually making landfall
- Dissipated on July 23, as it moved into the cooler waters off the coast of Nova Scotia

## **Hurricane Dolly**

**Maximum sustained winds:** 100 mph

**Dates:** July 20<sup>th</sup> to July 24<sup>th</sup>

**Lowest recorded pressure:** 964 mB

**Direct Fatalities:** 21 (1 U.S.)

### **Notes:**

- This marked the earliest time there have been four named cyclones since the 2005 season
- Dolly first made landfall as a tropical storm on July 21 as it briefly moved across the tip of the Yucatán Peninsula.
- Dolly strengthened to a Category 2 hurricane and made landfall for a second time on July 23<sup>d</sup> in South Padre Island, Texas
- The system brought up to 16 inches of rain to isolated areas before dissipating on July 27<sup>th</sup>
- AIR estimates the overall insured property loss between \$350Mn and \$700Mn, while RMS estimates a loss “much less” than \$750Mn

## **Tropical Storm Edouard**

**Maximum sustained winds:** 65 mph

**Dates:** August 3<sup>rd</sup> to August 5<sup>th</sup>

**Lowest recorded pressure:** 997 mB

**Direct Fatalities:** 0

### **Notes:**

- Edouard organized in the Gulf of Mexico, strengthened into a tropical depression on August 2<sup>nd</sup>, and reached tropical storm status on August 3<sup>rd</sup>.
- It made landfall in southern Texas (near Gilchrist) as a tropical storm on August 5<sup>th</sup> and weakened as it moved west-northwest toward central Texas.
- There was heavy rainfall, and moderate storm surge in Louisiana and Texas.

## **Tropical Storm Fay**

**Maximum sustained winds:** 65 mph

**Dates:** August 15<sup>th</sup> to August 24<sup>th</sup>

**Lowest recorded pressure:** 986 mB

**Direct Fatalities:** 25 (11 U.S.)

### **Notes:**

- Fay formed from a tropical wave off the coast of Africa on August 7<sup>th</sup>.
- By August 14<sup>th</sup> the storm had passed over the Virgin Islands and Puerto Rico and moved toward to Haiti where it made landfall the next day, producing heavy rains and flooding.
- Fay continued north and then stalled, making landfall in Florida on four separate occasions.
- Thousands of homes and roads in Florida were damaged, as the storm traveled through the entire state and produced up to five feet of rain.

## **Hurricane Gustav**

**Maximum sustained winds:** 150 mph

**Dates:** August 25<sup>th</sup> to September 2<sup>nd</sup>

**Lowest recorded pressure:** 941 mB

**Direct Fatalities:** 125+ (43 U.S.)

### **Notes:**

- Gustav was the third hurricane and second major hurricane of the 2008 Atlantic hurricane season.
- The storm formed out of a tropical wave over the Lesser Antilles, and developed Southwest of Haiti.
- Hurricane Gustav made first landfall near Jacmel, Haiti as a Category 1 on August 26<sup>th</sup>.
- After briefly downgrading to tropical storm status, Gustav regained power as it moved past Jamaica to Cuba, reaching Category 4 strength.
- On August 30<sup>th</sup>, Gustav made landfall twice on Cuba. By the next day it had entered the Gulf of Mexico as a Category 3.
- On September 1<sup>st</sup> Gustav made landfall along the southeast coast of Louisiana (near Cocodrie) as a Category 2 with sustained 110 mph winds, moved inland and dissipated by the 2<sup>nd</sup>.
- Storm surge was over 10 feet.

## **Hurricane Hanna**

**Maximum sustained winds:** 80 mph

**Dates:** August 28<sup>th</sup> to September 7<sup>th</sup>

**Lowest recorded pressure:** 978 mB

**Direct Fatalities:** 500+ (7 U.S.)

### **Notes:**

- Hanna was the fourth hurricane of the 2008 Atlantic hurricane season.
- This was the deadliest tropical cyclone in the Atlantic basin since Hurricane Stan in 2005.
- Hanna emerged as a storm wave off the coast of Africa and tracked west toward the Leeward Islands.
- Despite interference from Hurricane Gustav, the storm intensified into a hurricane by September 1<sup>st</sup>, but was downgraded back to a tropical storm on September 3<sup>rd</sup>.
- The storm brought heavy rain and strong winds to the Bahamas and Turks and Caicos, however Haiti suffered the most with severe flooding, mudslides and a death toll of over 500.
- By September 6<sup>th</sup> Hanna had made landfall as a tropical storm near the Carolinas border before traveling north, causing heavy winds and waves throughout the Northeast .
- The system became extra-tropical as it traveled further north into Atlantic Canada.

## **Hurricane Ike**

**Maximum sustained winds:** 145 mph

**Dates:** September 1<sup>st</sup> to September 14<sup>th</sup>

**Lowest recorded pressure:** 935 mB

**Direct Fatalities:** Several hundred (80+ U.S.)

### **Notes:**

- Ike was the fifth hurricane and third major hurricane of the 2008 Atlantic hurricane season.
- Ike began as a tropical disturbance off the coast of Africa.
- On September 3<sup>rd</sup> Ike rapidly intensified from a tropical storm to a major hurricane and within hours was upgraded to a Category 4. The next day, Ike had reached its peak intensity of 145 mph sustained winds and a pressure of 935mb, making it the most intense storm of the 2008 Atlantic hurricane season.
- Ike made landfall as a Category 3 hurricane in Cuba twice (on September 8<sup>th</sup> and 9<sup>th</sup>), before reaching the Gulf of Mexico.
- On September 13<sup>th</sup>, Ike made landfall on Galveston, Texas as a Category 2 hurricane, with an unusually wide wind field and high surges, more representative of a Category 4 or 5.
- Storm surge surpassed the 17-foot Galveston Seawall, and flood waters exceeded 12 feet in the nearby Bolivar Peninsula. Over 200 persons were reported missing in the days after the loss and the actual toll will likely not be known.
- Damage in coastal towns was extreme. Galveston had a mandatory curfew and evacuation orders which delayed adjusters.
- Ike maintained tropical characteristics through parts of Louisiana and Mississippi until it reached Arkansas on September 14<sup>th</sup>. Thereafter, Ike joined with another disturbance over the Midwest and caused hurricane-force winds through parts of Illinois, Indiana, Kentucky, Ohio and Pennsylvania. Damage was reported from Wisconsin, east into Quebec and New York, but was particularly heavy in and near Ohio.
- Energy loss was heavy as the storm surge was driven by Ike's previous Category 4 strength. Business interruption to refineries was also significant.

## **Tropical Storm Josephine**

**Maximum sustained winds:** 65 mph

**Dates:** September 2<sup>nd</sup> to September 5<sup>th</sup>

**Lowest recorded pressure:** 994 mB

**Direct Fatalities:** 4

### **Notes:**

- Josephine formed from a tropical wave off the west coast of Africa.
- The depression was upgraded to a tropical storm which moved erratically and fluctuated in intensity for several days.
- By September 5<sup>th</sup>, Josephine weakened and eventually dissipated, without a landfall.

## **Hurricane Kyle**

**Maximum sustained winds:** 80 mph

**Dates:** September 25<sup>th</sup> to September 29<sup>th</sup>

**Lowest recorded pressure:** 984 mB

**Direct Fatalities:** 0

### **Notes:**

- Kyle formed from a strong tropical disturbance over Africa and tracked across the northeastern Caribbean Sea.
- Before being upgraded to tropical storm status, Kyle passed over Puerto Rico and Hispaniola, bringing torrential rainfall which led to mudslides and flooding in excess of 30 inches.
- Kyle made landfall on September 28<sup>th</sup> near Yarmouth, Nova Scotia as a Category I hurricane, causing little damage.

## **Tropical Storm Laura**

**Maximum sustained winds:** 60 mph

**Dates:** September 29<sup>th</sup> to October 1<sup>st</sup>

**Lowest recorded pressure:** 994 mB

**Direct Fatalities:** 0

### **Notes:**

- Laura formed out of a large non-tropical low pressure area located west of the western islands of the Azores.
- Although Laura never affected land as a tropical storm, its remnants brought heavy rainfall and flooding to parts of Britain as well as northwestern parts of the Netherlands.

## **Tropical Storm Marco**

**Maximum sustained winds:** 65 mph

**Dates:** October 6<sup>th</sup> to October 7<sup>th</sup>

**Lowest recorded pressure:** 998 mB

**Direct Fatalities:** 0

### **Notes:**

- Marco started from a broad area of low pressure over the northwestern Caribbean Sea.
- It was the smallest tropical cyclone on record in any basin, extending out only 10 miles from the center.
- Marco made landfall in Veracruz, Mexico on October 7<sup>th</sup>.
- Heavy rainfall caused some flooding in coastal towns near Veracruz however the storm caused little damage and dissipated over Central Mexico by October 8<sup>th</sup>.

## **Tropical Storm Nana**

**Maximum sustained winds:** 40 mph

**Dates:** October 12<sup>th</sup> to October 13<sup>th</sup>

**Lowest recorded pressure:** 1005 mB

**Direct Fatalities:** 0

### **Notes:**

- Nana formed over the eastern Atlantic Ocean and moved west-northwest.
- Nana lost tropical storm status within one day of formation and quickly dissipated.

## **Hurricane Omar**

**Maximum sustained winds:** 135 mph

**Dates:** October 14<sup>th</sup> to October 18<sup>th</sup>

**Lowest recorded pressure:** 959 mB

**Direct Fatalities:** 0

### **Notes:**

- Omar was the seventh hurricane and fourth major hurricane of the 2008 Atlantic hurricane season.
- It formed from a tropical disturbance over the Northern Atlantic which moved to the eastern Caribbean Sea.
- Within days, the storm escalated from a tropical depression to a Category 4 hurricane with peak wind speeds of 135 mph.
- Omar quickly weakened after passing between Puerto Rico and the USVI's, causing light damage despite its high intensity, as the eye remained over water.

## **Hurricane Paloma**

**Maximum sustained winds:** 145 mph

**Dates:** November 6<sup>th</sup> to November 9<sup>th</sup>

**Lowest recorded pressure:** 943 mB

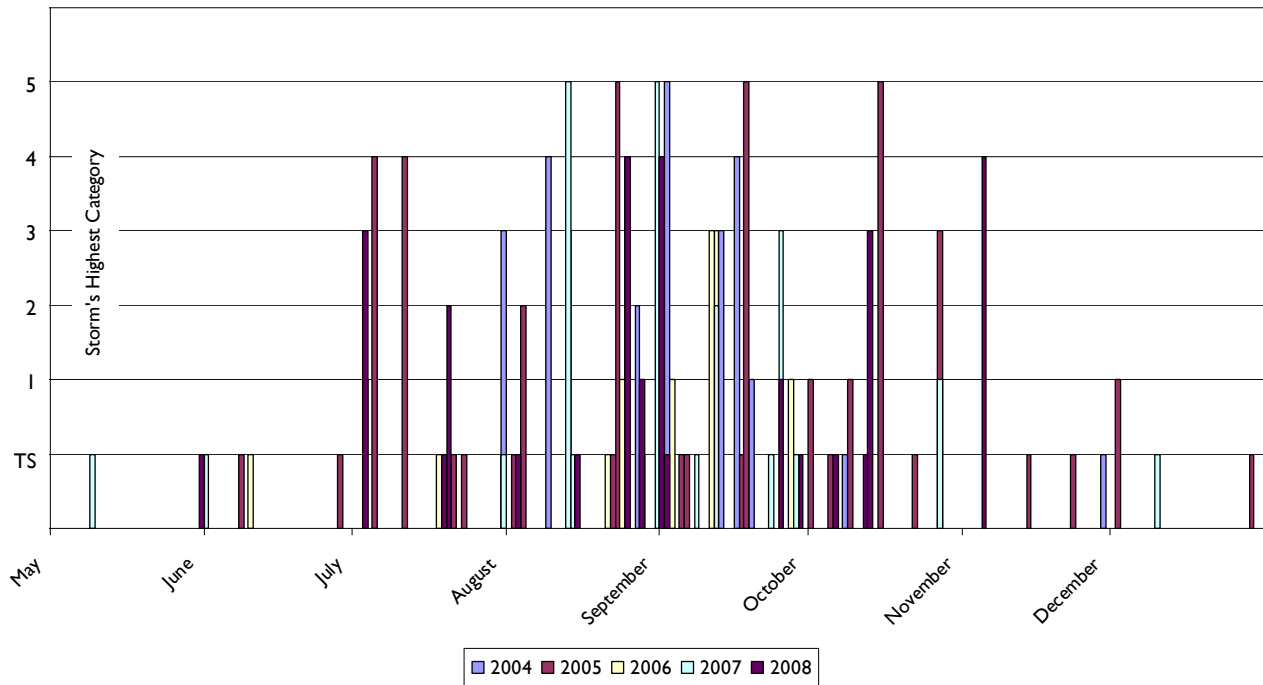
**Direct Fatalities:** NA

### **Notes:**

- Paloma was the eighth hurricane and fifth major hurricane of the 2008 Atlantic hurricane season.
- It is one of only seven major hurricanes recorded in the month of November.
- It developed from a strong tropical disturbance off the eastern coast of Nicaragua and northern coast of Honduras, moved east and strengthened rapidly to Category 4.
- On September 8<sup>th</sup> Paloma made landfall in Santa Cruz del Sur, Cuba as Category 3, then weakened to a tropical storm while moving over Cuba and dissipated by the evening of November 9<sup>th</sup>.
- Paloma impacted Cuba the most, knocking down a major communications tower, destroying hundreds of homes and moving the coastline inland by nearly a mile due to a 14-foot storm surge.

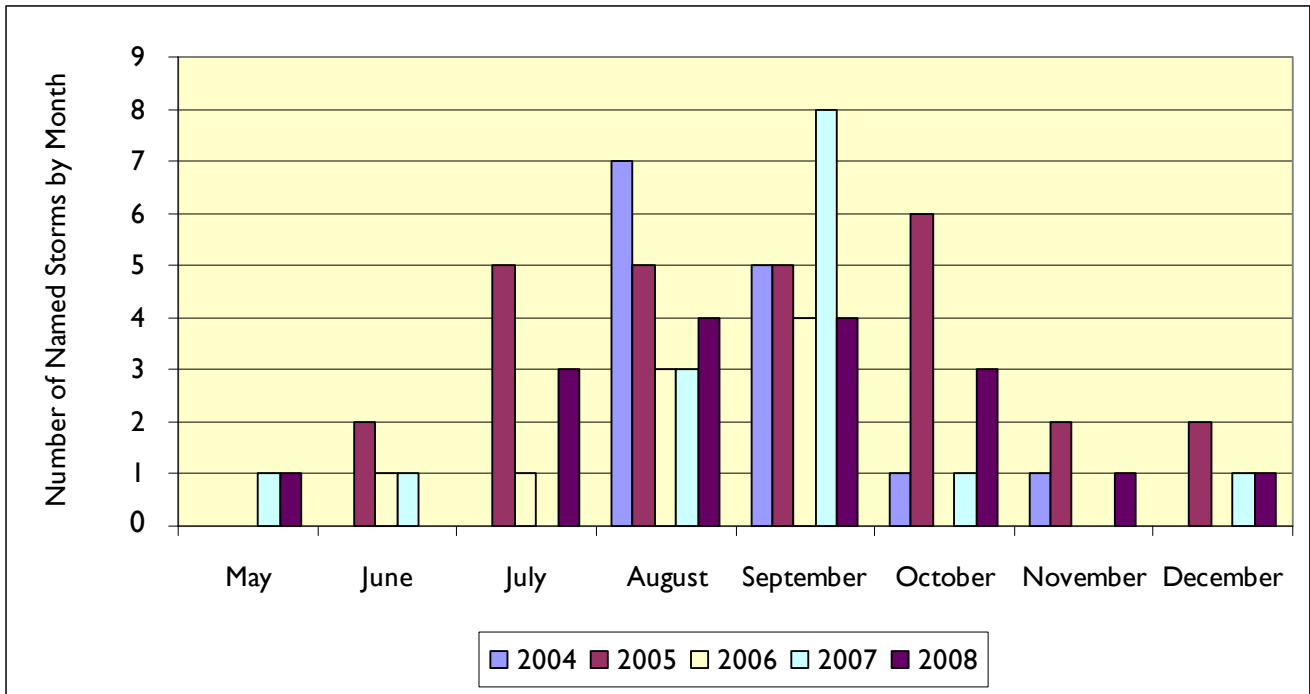
## B. Seasons Compared

Atlantic and Caribbean storms by date: 2004 through 2008

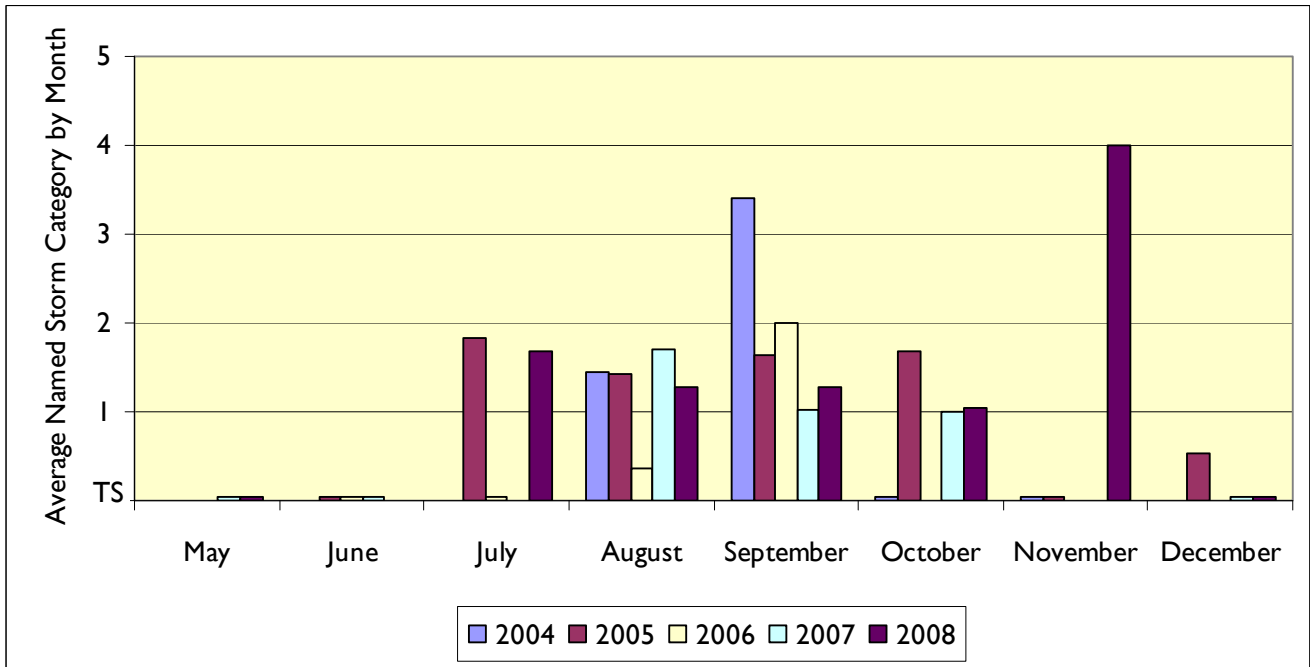


Note: Date shown is the date that each storm was first named. Some dates have had storms in more than one year; e.g., August 13 had Alex in 2004 and Erin in 2007.

**2008 was another active season**



**Storm strength was comparable to recent years, although Category 4 Paloma in November was unusual**



## C. Previous Hurricane Seasons

### 2004 Season details

Storm	Highest Category	U.S. Landfall Categories	Dates	Max winds (mph)	Min. Pressure (mB)	Location(s) of U.S. Landfall
Hurricane Alex	3		7/31 - 8/6	120	957	
Tropical Storm Bonnie	TS	TS	8/3 - 8/14	65	1001	Apalachicola, Florida
<b>Hurricane Charley</b>	<b>4</b>	<b>4, 1</b>	<b>8/9 - 8/14</b>	<b>150</b>	<b>941</b>	<b>Port Charlotte, FL; North Myrtle Beach, SC</b>
Hurricane Danielle	2		8/13 - 8/21	110	964	
Tropical Storm Earl	TS	2	8/13 - 8/16	50	1009	
<b>Hurricane Frances</b>	<b>4</b>	<b>2</b>	<b>8/25 - 9/10</b>	<b>145</b>	<b>935</b>	<b>Sewall's Point, Florida</b>
Hurricane Gaston	1	1	8/27 - 9/1	75	986	Bulls Bay, South Carolina
Tropical Storm Hermine	TS	TS	8/27 - 8/31	60	1002	New Bedford, Massachusetts
<b>Hurricane Ivan</b>	<b>5</b>	<b>3</b>	<b>9/2 - 9/24</b>	<b>165</b>	<b>910</b>	<b>Cameron, Louisiana</b>
<b>Hurricane Jeanne</b>	<b>3</b>	<b>3</b>	<b>9/13 - 9/28</b>	<b>120</b>	<b>951</b>	<b>Port St. Lucie, Florida</b>
Hurricane Karl	4		9/16 - 9/28	145	938	
Hurricane Lisa	1		9/19 - 10/3	75	987	
Tropical Storm Matthew	TS	TS	10/8 - 10/10	45	997	Cocodrie, Louisiana
Tropical Storm Otto	TS		11/29 - 12/2	50	995	

**2005 Season details**

Storm	Highest Category	U.S. Landfall Categories	Dates	Max winds (mph)	Min Pressure (mB)	Location(s) of U.S. Landfall
Tropical Storm Arlene	TS	TS	6/08 - 6/12	70	989	Florida Panhandle, Florida
Tropical Storm Bret	TS		6/28 - 6/30	40	1004	
Hurricane Cindy	I	I	7/03 - 7/06	75	997	Grand Isle, Louisiana
Hurricane Dennis	4	3	7/05 - 7/11	150	930	Pensacola, Florida
Hurricane Emily	4		7/11 - 7/21	155	930	
Tropical Storm Franklin	TS		7/21 - 7/29	70	997	
Tropical Storm Gert	TS		7/23 - 7/25	45	1005	
Tropical Storm Harvey	TS		8/02 - 8/08	65	994	
Hurricane Irene	2		8/04 - 8/18	105	975	
Tropical Storm Jose	TS		8/22 - 8/23	50	1001	
<b>Hurricane Katrina</b>	<b>5</b>	<b>I, 4</b>	<b>8/23 - 8/30</b>	<b>175</b>	<b>902</b>	<b>North Miami Beach, FL; Plaquemines Parish, LA</b>
Tropical Storm Lee	TS		8/28 - 9/02	40	1007	
Hurricane Maria	3		9/01 - 9/10	115	960	
Hurricane Nate	I		9/05 - 9/10	90	979	
Hurricane Ophelia	I	I	9/06 - 9/18	85	976	Cape Fear, North Carolina
Hurricane Philippe	I		9/17 - 9/24	80	985	
<b>Hurricane Rita</b>	<b>5</b>	<b>3</b>	<b>9/18 - 9/25</b>	<b>175</b>	<b>897</b>	<b>Sabine Pass, Louisiana</b>
Hurricane Stan	I		10/01 - 10/05	80	979	
Tropical Storm Tammy	TS	TS	10/05 - 10/06	50	1001	Atlantic Beach, Florida
Hurricane Vince	I		10/09 - 10/11	75	987	
<b>Hurricane Wilma</b>	<b>5</b>	<b>3</b>	<b>10/15 - 10/25</b>	<b>175</b>	<b>882</b>	<b>Cape Romano, Florida</b>
Tropical Storm Alpha	TS		10/22 - 10/24	50	998	
Hurricane Beta	3		10/27 - 10/31	115	960	
Tropical Storm Gama	TS		11/14 - 11/20	45	1004	
Tropical Storm Delta	TS		11/23 - 11/28	65	980	
Hurricane Epsilon	I		12/2 - 12/8	80	982	
Tropical Storm Zeta	TS		12/29 - 1/6	65	994	

**2006 Season details**

Storm	Highest Category	Dates	Max winds (mph)	Min Pressure (mB)	Location(s) of U.S. Landfall
Tropical Storm Alberto	TS	6/10 - 6/14	70	995	Tallahassee, Florida
Tropical Storm Beryl	TS	7/18 - 7/21	60	1000	Nantucket, Massachusetts
Tropical Storm Chris	TS	7/31 - 8/5	65	1001	
Tropical Storm Debby	TS	8/21 - 8/26	50	999	
Hurricane Ernesto	I	8/24 - 9/1	75	987	Florida Keys; Long Beach, NC
Hurricane Florence	I	9/3 - 9/12	90	972	
Hurricane Gordon	3	9/11 - 9/20	120	955	
Hurricane Helene	3	9/12 - 9/24	125	954	
Hurricane Isaac	I	9/27 - 10/2	85	985	

**2007 Season details**

Storm	Highest Category	Dates	Maximum Winds (mph)	Minimum Pressure (mB)	Location(s) of Landfall
Subtropical Storm Andrea	TS	5/9 - 5/11	60	1001	None
Tropical Storm Barry	TS	6/1 - 6/2	60	997	Tampa Bay, FL
Tropical Storm Chantal	TS	7/31 - 8/1	50	994	St. John's, Newfoundland
<b>Hurricane Dean</b>	<b>5</b>	<b>8/13 - 8/23</b>	<b>165</b>	<b>906</b>	<b>Costa Maya and Tuxpan, Mexico</b>
Tropical Storm Erin	TS	8/14 - 8/19	40	1003	Lamar, TX
<b>Hurricane Felix</b>	<b>5</b>	<b>8/31 - 9/5</b>	<b>165</b>	<b>929</b>	<b>Puerto Cabezas, Nicaragua</b>
Tropical Storm Gabrielle	TS	9/8 - 9/11	60	1004	Cape Lookout, NC
Hurricane Humberto	I	9/12 - 9/14	90	985	High Island, TX
Tropical Storm Ingrid	TS	9/12 - 9/17	45	1002	None
Tropical Depression 10	TD	9/21 - 9/22	35	1005	Eustis, FL
Tropical Storm Jerry	TS	9/23 - 9/24	45	1003	None
Hurricane Karen	I	9/25 - 9/29	70	990	None
Hurricane Lorenzo	I	9/25 - 9/28	80	990	Tecolutla, Mexico
Tropical Storm Melissa	TS	9/28 - 9/30	40	1005	None
Tropical Depression 15	TD	10/11 - 10/12	35	1011	None
Hurricane Noel	I	10/27 - 11/2	80	980	Haiti, Cuba, Bahamas
Tropical Storm Olga	TS	12/10 - 12/12	45	1002	Puerto Rico

## *D. For More Information*

### **Holborn Contacts**

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Kathy Sandberg

Holborn provides the latest information on these issues in a variety of easy-to-use e-mail formats. We provide updates on recent and potential catastrophe events for several regions through an e-mail service. Users of Holborn's on-line Eye-in-the-Sky (SM) can receive automatic notifications of recent events that expose their own portfolios, based on the latest reports from NOAA.

### **About Holborn**

Holborn is an independent reinsurance brokerage firm, offering advanced analytic tools, global market access and responsive account services to clients across the United States. The company was formed in 1920, making us one of the most experienced reinsurance brokers in the world. We are owned exclusively by our employees. This contributes to Holborn's stable client base and noteworthy ability to attract and retain talent.

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