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# **2009 Catastrophe Losses in Context**

December 1, 2009

**HOLBORN**

## 2009 Catastrophe Losses in Context

### Overview

2009 was a year with limited U.S. hurricane losses, and relatively few events affecting the reinsurance market worldwide. This has helped produce strong earnings to reinsurers, whose loss ratios have a 6%-9% benefit from this good experience, relative to long-term averages.

To review the history of large market losses, we created a consistent 25-year database of events with the same relative amount of insured losses. This data shows U.S. hurricane exposure as the key driver of worldwide reinsurance experience, and thus market pricing. However, there are no significant trends in the number or relative size of market losses over this time.

The paper contains four major sections:

- A. The 2009 Hurricane Season
- B. Seasons Compared
- C. Large Market Losses Since 1985
- D. For More Information

### A. The 2009 Hurricane Season

The U.S. experienced limited damage from hurricanes and tropical storms in 2009. Internationally, the season was less active than expected, but with a surprisingly active period in late August. Four storms occurring in a two-week span is unusual, even in an active season. In total, 2009 had fewer named storms and fewer hurricanes than average. But, with two major hurricanes (Bill: a “4” and Fred: a “3”), 2009 was near reported average for these stronger storms.

#### 2009 Season summary

Totals	Actual	Colorado State April 9 Projection	Colorado State August 4 Revision	1950 - 2009 Average	% Below Average
Named Storms	9	12	10	10.25	12%
Hurricanes	3	6	4	6	50%
Major Hurricanes: 3+	2	2	2	2.5	20%
Named Storm Days	28	55	45	51	47%

Source: Professors Gray and Klotzbach, CSU

2009 was one of the least-active recent years, as measured by storm activity, U.S. landfalls, insured losses or fatalities.

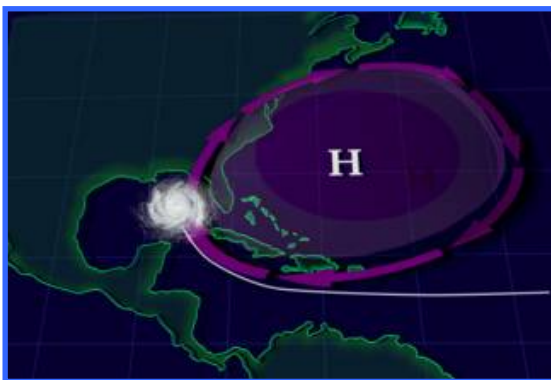
**2009 Storm details**

Storm	Highest Category	U.S. Landfalls Categories	Dates	Maximum Winds (mph)	Minimum Pressure (mb)	Location(s) of Landfall	Worldwide Deaths
Ana	TS		August 11th to August 16th	40	1003	None	None
Bill	4		August 15th to August 24th	130	943	Newfoundland	2
Claudette	TS	TS	August 16th to August 18th	50	1006	Florida	2
Danny	TS		August 26th to August 29th	60	1006	None	1
Erika	TS		September 1st to September 3rd	50	1004	Lesser Antilles	None
Fred	3		September 7th to September 12th	120	958	None	10
Grace	TS		October 4th to October 6th	70	986	Azores	None
Henri	TS		October 6th to October 8th	50	1005	None	None
Ida	2	TS	November 4th to November 10th	105	976	Nicaragua, Alabama	10 (275, incl. El Salvador flood)
<b>9 Storms</b>	<b>4</b>	<b>TS (2x)</b>	<b>August 11th - November 10th</b>	<b>130</b>	<b>943</b>	<b>6 Landfalls</b>	<b>290</b>

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

- Atlantic water temperatures were periodically lower than recent averages.
- A moderate El Niño, a pattern of warm water in the eastern Pacific, which is associated with lower storm frequency and increased wind shear.
- An Eastern location for the Bermuda High during most of the active portion of the season steered many of the storms away from the Gulf Coast. Seasons in which the Bermuda High expands to the south and west tend to have more Gulf landfalling storms, as shown in the conceptual maps below. However, in 2009 the high was at times so far to the east that most of the storms that did arise passed the U.S. and had landfalls in Canada, if at all.

**Bermuda High in 2004, 2005 and 2008**



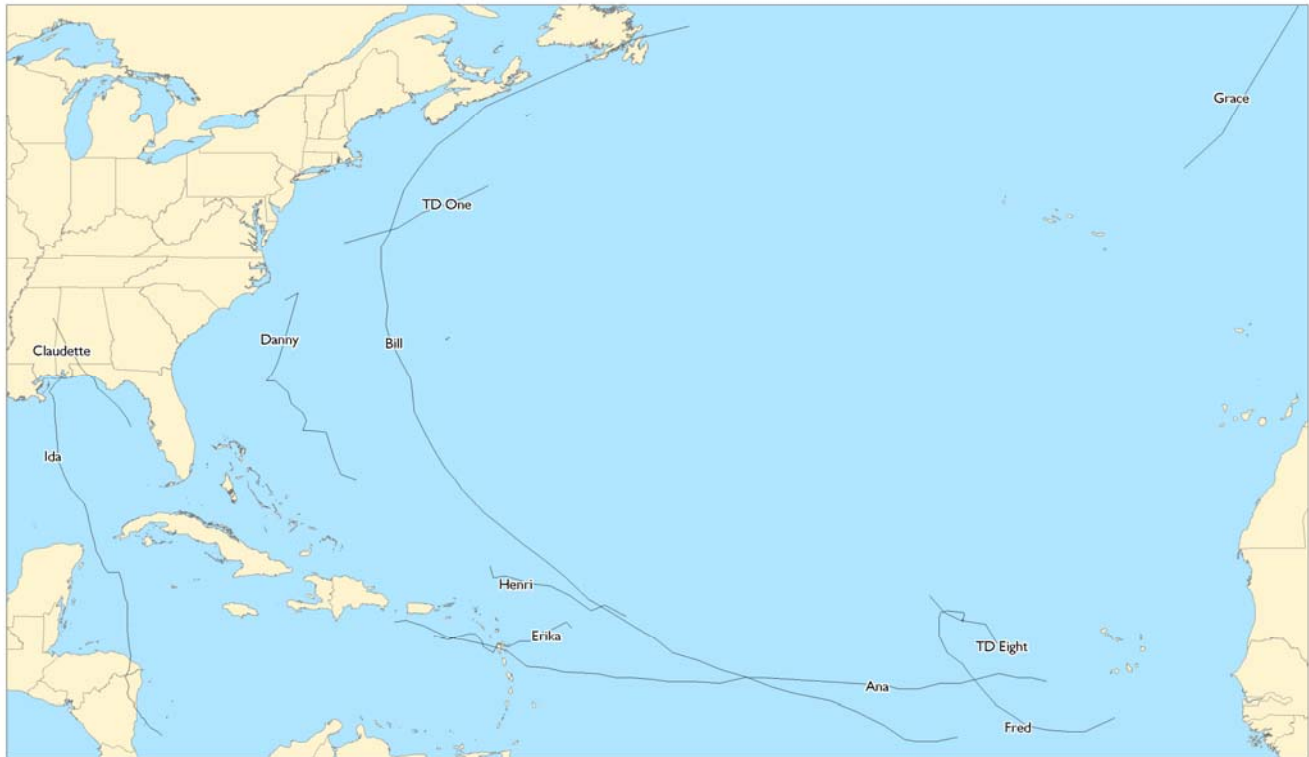
**Bermuda High in 2006, 2007 and 2009**



Source: NASA, Goddard Space Flight Center

Consistent with this easterly position of the Bermuda high, only two of the eleven organized systems in 2009 passed west of Florida.

### **2009 Atlantic and Caribbean storm tracks**



### **Hurricane outlook for 2010**

At this time of year, Dr. Bill Gray’s team at Colorado State has usually released their first forecast of the next hurricane season. While all weather projections have wide uncertainty, in our opinion, Dr. Gray’s transparency and long track record make his reports more credible than some others.

We are very interested in the CSU forecast of 2010 when it is available. In the interim, we note that most Atlantic water temperatures remain slightly below their seasonal averages, and that the current El Niño conditions are forecast by NOAA to last through mid-summer. Both trends, if continuing, would somewhat reduce expected levels of hurricane activity. While both factors can easily change over the next six months, Holborn expects 2010 to look more like the 2007 – 2009 period than the 2004 – 2005 period, and closer to the long-term averages.

A key consideration in public climate forecasts — and some of the frequency forecasts in catastrophe models — is the global temperature database maintained by East Anglia University in England. Recent news reports question the objectivity and reproducibility of this data. This may increase the range of uncertainty in both climate forecasts and hurricane models in the future.

## B. Seasons compared

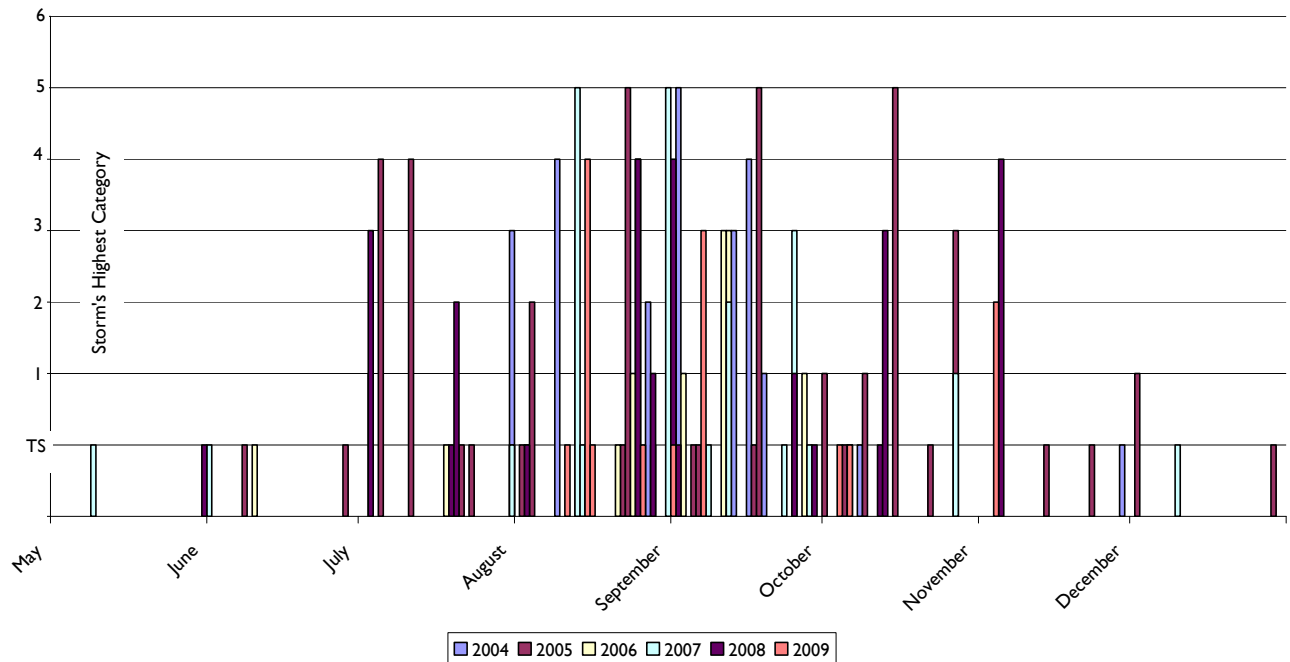
### 2004-2009 Hurricane seasons

	Named Storms	Hurricanes	Major Hurricanes	U.S. Landfalls	U.S. Gross Insured Loss	Worldwide 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	17	8	5	6	>\$30Bn	1,200+
2009	9	3	2	2	approx. \$500Mn	290

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

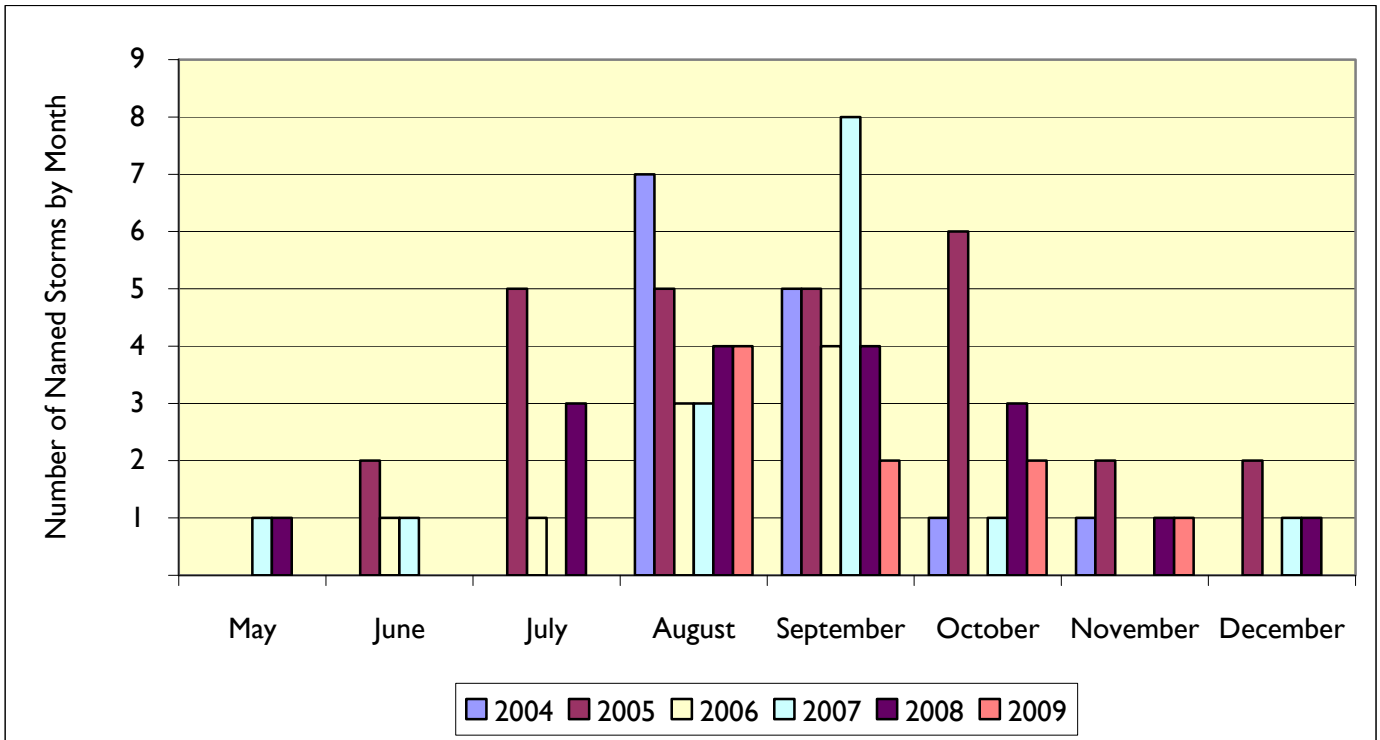
2009 storms, shown below as orange bars, were not as frequent or extreme as in same previous years.

### Atlantic and Caribbean storms by date: 2004 through 2009

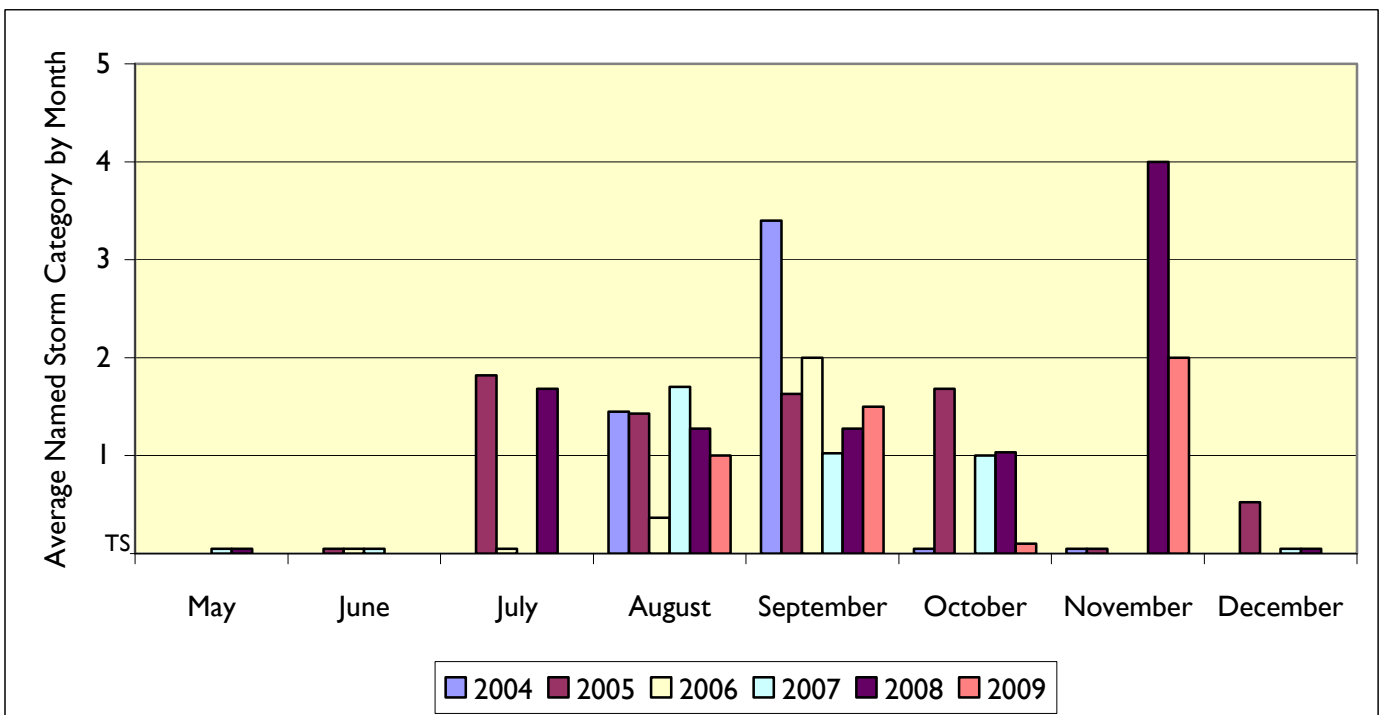


Note: Date shown is the date that each storm was first named. Some dates have had storms in more than one year; e.g., August 13 had Alex in 2004 and Erin in 2007.

**2009 was calm, except for August**



**But, average storm strength was comparable to recent years.**



## C. Large Market Losses since 1985

To provide a consistent view of large losses, Holborn has compiled a 25-year history of events worldwide with insured losses above 1/2% of U.S. gross written premiums. We included all coverages and LAE.

Year	Loss	Reported Fatalities	Worldwide Direct Insured Losses	% of U.S. Industry GWP	Reinsured Losses	% of Reinsurance Industry GWP
1985	Mexico City Earthquake	10,153	\$4Bn	2.6%	\$.5Bn – \$1.5Bn	NA
1987	UK Winterstorm (87J)	23	\$5Bn	2.4%	\$1Bn – \$1.5Bn	NA
1988	Piper Alpha Rig Explosion	167	\$2.5Bn	1.0%	\$1.5Bn – \$2Bn	NA
1988	Hurricane Gilbert	341	\$6Bn	2.8%	\$2Bn – \$3Bn	NA
1989	Exxon Valdez Oil Spill	0	\$4.5Bn	1.6%	Direct*	NA
1989	Hurricane Hugo	56	\$7.5Bn	3.4%	\$2Bn – \$3Bn	NA
1989	Loma Prieta Earthquake	63	\$7.5Bn	3.4%	\$2Bn – \$3Bn	NA
1989	Phillips Petroleum Explosion	23	\$1.5Bn	0.7%	Direct*	NA
1990	UK Winter Storm Daria (Burns' Day)	95	\$7Bn	0.3%	\$2Bn – \$3Bn	NA
1990	UK Winter Storms Vivian, etc	64	\$5Bn	2.1%	\$1Bn – \$2Bn	NA
1991	Typhoon Mireille, Japan	52	\$5Bn	2.1%	\$2Bn – \$3Bn	NA
<b>1992</b>	<b>Hurricane Andrew</b>	<b>26</b>	<b>\$15.5Bn</b>	<b>6.3%</b>	<b>\$3Bn – \$4Bn</b>	<b>NA</b>
1993	Mississippi Flood	50	\$3Bn	1.2%	<\$1Bn	NA
<b>1994</b>	<b>Northridge Earthquake</b>	<b>72</b>	<b>\$17.5Bn</b>	<b>6.5%</b>	<b>\$5Bn – \$6Bn</b>	<b>NA</b>
1995	Kobe Earthquake	6,434	\$5Bn	1.8%	< \$2Bn	NA
1995	Texas Hail (Cat 38)	13	\$4Bn	1.4%	< \$1Bn	NA
1995	Hurricane Opal	70	\$3Bn	1.1%	\$1Bn – \$2Bn	NA
1996	Hurricane Fran	26	\$3.5Bn	1.2%	\$1Bn – \$2Bn	NA
1998	Hurricane Georges	604	\$4Bn	1.3%	\$1Bn – \$2Bn	NA
1999	Izmit, Turkey Earthquake	17,217	\$4Bn	1.3%	< \$1Bn	NA
1999	Hurricane Floyd	57	\$5Bn	1.6%	\$1Bn – \$2Bn	NA
1999	Typhoon Bart	26	\$4Bn	1.3%	\$1Bn – \$2Bn	NA
1999	European Winter Storm Lothar	50	\$9Bn	2.9%	\$3Bn – \$4Bn	NA
1999	European Winter Storm Martin	30	\$6Bn	2.0%	\$1Bn – \$2Bn	NA
<b>2001</b>	<b>September 11th Attacks</b>	<b>3,017</b>	<b>\$41Bn</b>	<b>11.3%</b>	<b>\$20Bn – \$25Bn</b>	<b>15% - 20%</b>
2001	Hurricane Allison	41	\$3.5Bn	1.0%	\$1Bn – \$2Bn	0.8% - 1.6%
2002	Czech Floods	84	\$4Bn	1.0%	\$1Bn – \$2Bn	0.6% - 1.3%
2003	St. Louis Tornadoes	45	\$3.5Bn	0.8%	\$1Bn – \$2Bn	0.5% - 1.0%
2003	California Wild Fires	15	\$3Bn - \$4Bn	0.8%	< \$1Bn	< 0.5%
<b>2004</b>	<b>Hurricane Charley</b>	<b>35</b>	<b>\$12.5Bn</b>	<b>2.6%</b>	<b>\$1.5Bn – \$2.5Bn</b>	<b>0.75% - 1.25%</b>
2004	Hurricane Frances	49	\$7Bn	1.5%	\$1Bn – \$2Bn	0.5% - 1.0%
2004	Typhoon Songda	45	\$3.5Bn	0.7%	\$1Bn – \$1.5Bn	0.5% - 0.75%
<b>2004</b>	<b>Hurricane Ivan</b>	<b>123</b>	<b>\$11.5Bn</b>	<b>2.4%</b>	<b>\$1.5Bn – \$2.5Bn</b>	<b>0.75% - 1.25%</b>
2004	Hurricane Jeanne	3,035	\$5Bn	1.1%	\$1Bn – \$2Bn	0.5% - 1.0%
2005	Indian Ocean Tsunami	230,000	\$5Bn	1.0%	< \$1Bn	0.6% - 1.1%
<b>2005</b>	<b>Hurricane Katrina</b>	<b>1,836</b>	<b>\$65Bn</b>	<b>13.3%</b>	<b>\$20Bn – \$24Bn</b>	<b>9.7% - 14.6%</b>
<b>2005</b>	<b>Hurricane Rita</b>	<b>34</b>	<b>\$8Bn – \$10Bn</b>	<b>1.6% - 2.1%</b>	<b>\$2Bn – \$3Bn</b>	<b>1.1% - 1.6%</b>
<b>2005</b>	<b>Hurricane Wilma</b>	<b>35</b>	<b>\$12Bn – \$15Bn</b>	<b>2.5% - 3.1%</b>	<b>\$3Bn – \$4Bn</b>	<b>1.6% - 2.2%</b>
2007	California Wild Fires	14	\$3Bn	0.8%	< \$1Bn	< 0.5%
2007	European Winter Storm Kyrill	44	\$6Bn	1.2%	\$1Bn – \$1.5Bn	0.5% - 0.7%
2007	UK Floods	13	\$7Bn	1.4%	\$1Bn – \$1.5Bn	0.5% - 1.7%
2008	Hurricane Gustav	112	\$6Bn – \$8Bn	1.2% - 1.7%	\$1Bn – \$2Bn	0.5% - 1.0%
<b>2008</b>	<b>Hurricane Ike</b>	<b>103</b>	<b>\$18Bn – \$22Bn</b>	<b>3.7% - 4.6%</b>	<b>\$6Bn – \$7Bn</b>	<b>3.1% - 3.6%</b>
<b>1985 – 2009 Totals</b>	<b>43 Events</b>	<b>274,392</b>	<b>\$360Bn - \$380Bn</b>		<b>\$105Bn - \$150Bn*</b>	
<b>25-Year Averages</b>	<b>1.72 per year</b>	<b>10,976</b>	<b>\$14Bn - \$16Bn</b>	<b>4.5% - 5.5%</b>	<b>\$4.25Bn - \$6Bn</b>	<b>4% - 6%**</b>

Source: Holborn estimates of worldwide market loss, Foreign currencies converted at historic rates; based on PCS, Ill, Sigma and market reports. Related losses within events are considered to be one occurrence, except Lothar and Martin in December, 1999 which most cedents and markets agreed are two occurrences.

\*Note: Reinsurers' participations on these events were largely as direct and fac placements, not treaty, and are included in totals.

\*\*Average since 2001

We have tracked several other events, often tragic, that produced relatively smaller amounts of insured losses. These are not included in the analysis as the size of the losses were not likely to move the U.S. reinsurance market.

**Other notable events**

Year	Loss	Reason Event is Not Included
1986	Chernobyl reactor fire	\$500Bn loss, but was uninsured
1989	Kuwait aircraft confiscation	Just below 1/2% of U.S. GWP
1991	Mt. Pinatubo Eruption	Several \$Bn in USN / USAF Property
1991	Bangladesh cyclone	138,000 Deaths, but little was insured
1993	Latur, India earthquake	10,000 Deaths, but little was insured
1999	River Rouge plant explosion	\$1Bn Loss, 6 deaths, 40 WC claims
2008	Mississippi Floods	\$2.5Bn < 1/2% GWP
2008	Cyclone Nargis (Burma)	130,000 Deaths, but little was insured
2008	Sichuan, China earthquake	90,000 Deaths, \$1Bn insured

We have summarized the history of market losses by region, peril, calendar quarter and date.

**1985-2009 Market losses by region**

Event by Region	Direct Insured Loss	Number of Events	Fatalities	Reinsured Loss	% of Total R/I Loss
North America	\$281.0 - \$293.0	27	20,048	\$83.0 - \$112.0	76.6%
Europe	\$53.0	9	17,620	\$12.0 - \$18.5	12.0%
Asia	\$22.5	5	236,557	\$7.0 - \$9.5	6.5%
Marine	\$7.0	2	167	\$6.0 - \$6.5	4.9%
<b>Total</b>	<b>\$360.0 - \$380.0</b>	<b>43</b>	<b>274,392</b>	<b>\$105.0 - \$150.0</b>	<b>100.0%</b>

Note: Dollar figure in Billions

Most events and losses have been in North America. Most fatalities on those events have been in Asia.

Most events and losses have been caused by tropical cyclones, including hurricanes. Most deaths on these losses occurred in the 2005 tsunami. But earthquake is otherwise the deadliest peril in these market losses (and in other notable disasters.)

**1985-2009 Market losses by peril**

Peril	Direct Insured Loss (\$Bn)	Number of Events	Average Event Loss	Fatalities	Reinsured Loss	% of Total R/I Loss
Hurricane / Typhoon	\$205.5 - \$216.5	20	\$10.5	6,706	\$53.0 - \$75.5	50.5%
Earthquake / Tsunami	\$43.0	6	\$7.2	263,939	\$11.5 - \$14.5	10.2%
Terrorism	\$41.0	1	\$41.0	3,017	\$20.0 - \$25.0	17.7%
Winter Storm	\$38.0	6	\$6.3	306	\$9.0 - \$14.0	9.0%
Flood	\$14.0	3	\$4.7	147	\$3.0 - \$4.5	2.9%
Marine / Risk	\$8.5	3	\$2.8	190	\$7.5 - \$10.0	6.1%
Tornado / Hail	\$7.5	2	\$3.8	58	\$2.0 - \$3.0	2.0%
Wild Fire	\$6.0 - \$7.0	2	\$3.25	29	\$2.0	1.6%
<b>Total</b>	<b>\$360.0 - \$380.0</b>	<b>43</b>	<b>\$9.9</b>	<b>274,392</b>	<b>\$105.0 - \$150.0</b>	<b>100.0%</b>

Note: Dollar figure in Billions

The third quarter of the year has been the most costly in insured losses, mostly due to U.S. hurricane losses. The next most costly quarter has been the fourth, with several U.S. hurricane and also U.K. winter storms. The second quarter has been the most benign. Excluding seismic events, the third quarter is the deadliest, with high hurricane fatalities in the Caribbean and the 9/11 attack.

**1985-2009 Market losses by calendar quarter**

Event Loss by Calendar Quarter	1st Quarter <i>January - March</i>	2nd Quarter <i>April - June</i>	3rd Quarter <i>July - September</i>	4th Quarter <i>October - December</i>
Number of Events	6	5	23	9
Fatalities	6,709	162	37,268	230,253
Direct Insured Loss	\$45.0	\$21.0	\$245.5 - \$251.5	\$52 - \$58
% of Total	12.2%	5.7%	67.3%	14.9%
Reinsured Loss	\$15.5 - \$19.0	\$5.0 - \$7.5	\$73.0 - \$101.0	\$14.5 - \$19.0
% of Total	13.6%	4.9%	68.4%	13.2%

Note: Dollar figure in Billions

There are few signs of long-term trends in the number or size of these market losses.

**1985-2009 Market losses by half decade**

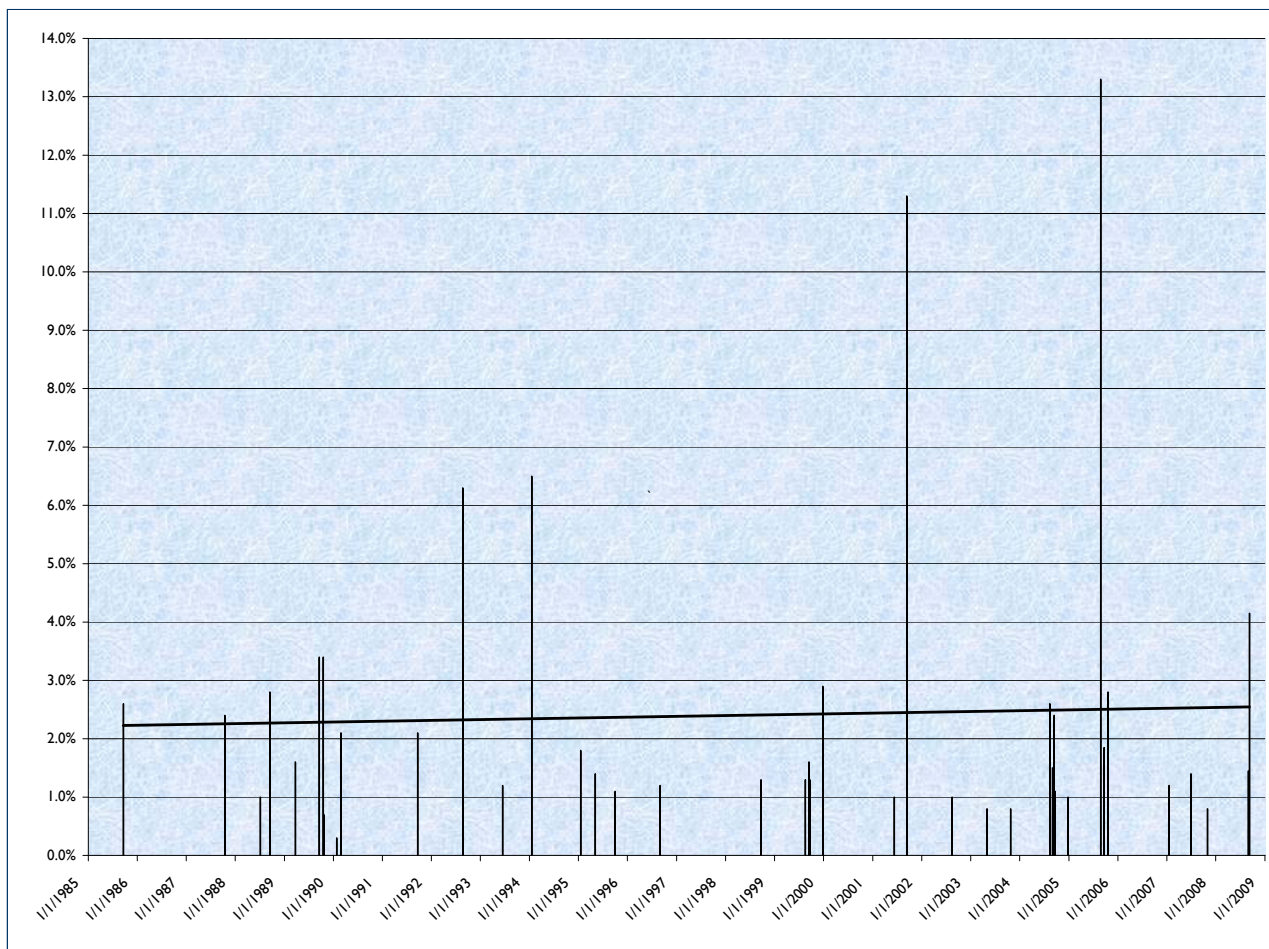
Event Losses by Half Decade	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	1985-2009 Total
Number of Events	8	6	10	10	9	43
Fatalities	10,826	359	24,527	6,489	232,191	274,392
Direct Insured Loss	\$38.5	\$53.0	\$47.5	\$94.5	\$130.0	\$363.5
Reinsured Loss	\$15.0 - \$20.0	\$14.0 - \$19.0	\$13.0 - \$20.0	\$30.0 - \$42.5	\$36.0 - \$45.0	\$108.0 - \$146.5
R / I % of Industry GWP	1.77%	1.33%	1.13%	1.78%	2.06%	1.65%
R / I % of Gross Loss	13.75%	12.97%	12.97%	28.49%	31.83%	100.00%

Note: Dollar figure in Billions

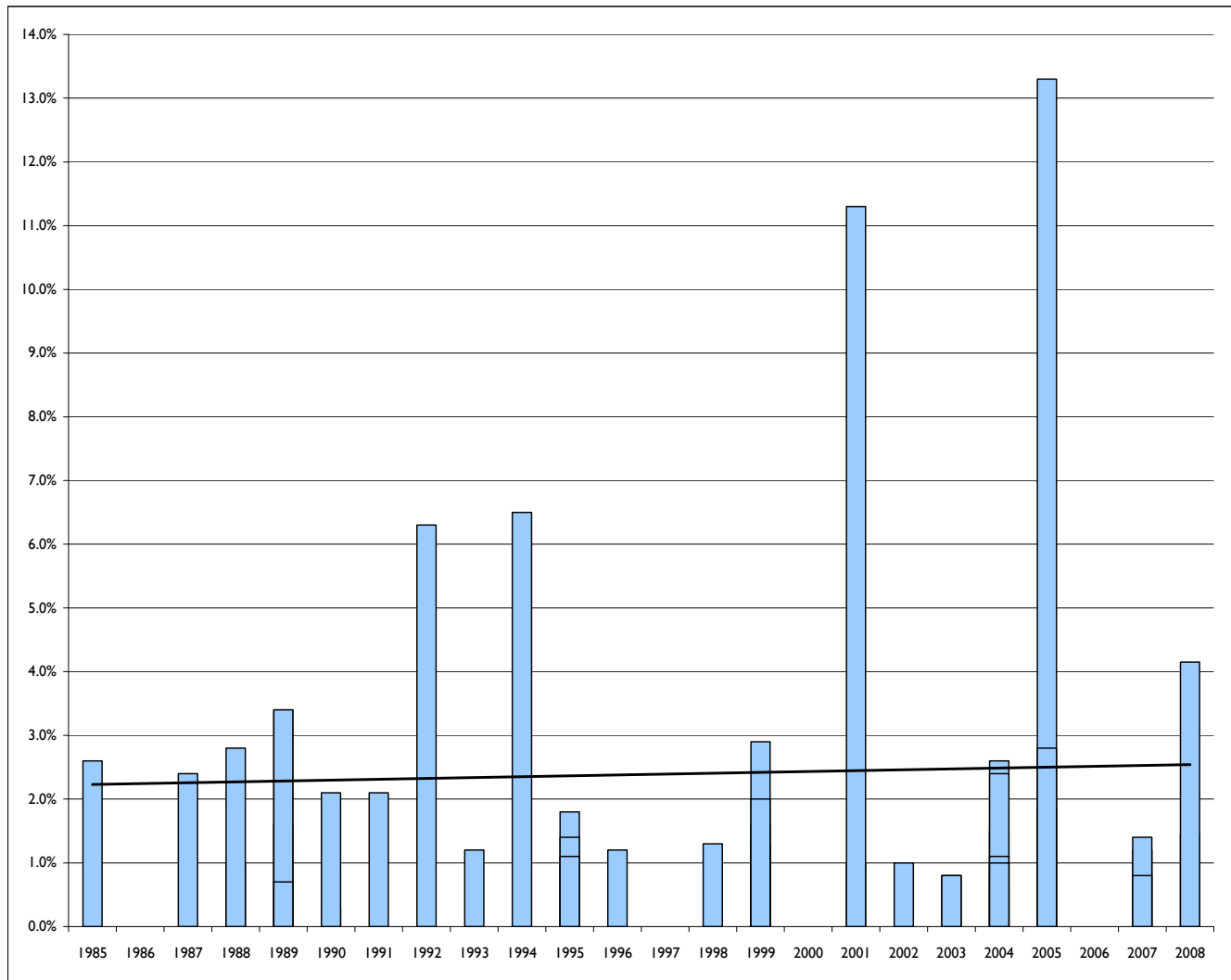
**Market losses relative to U.S. GWP**

The trend relative to U.S. GWP is more indicative of the currently soft U.S. market than changes in the nature of the events.

**Per occurrence gross losses**



Annual aggregate losses (all occurrences combined)



Note: Trend lines are straight-line fits to historical experience.

## **D. For More Information**

### **Appendices**

- 1. Details on 2009 Storms*
- 2. Previous Hurricane Seasons*
- 3. Record Hurricanes*

### **Holborn Contacts**

Paul Kneuer

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### **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.

Holborn provides the latest information and we provide updates on recent and potential catastrophe events for several regions in a variety of easy-to-use e-mail formats. 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.

Please contact Holborn at 212-797-2285 for reprints of this or previous Holborn Perspectives whitepapers, and for more information. Downloads are also available from our website at <http://www.holborn.com/holborn/reports.html>.

## I. Details on 2009 Storms

### ***Tropical Storm Ana***

**Maximum sustained winds:** 40 mph

**Dates:** August 11<sup>th</sup> to August 16<sup>th</sup>

**Lowest recorded pressure:** 1003 mB

**Direct Fatalities:** 0

#### **Notes:**

- One of the latest “A” storms to develop: a slow start to the 2009 season
- Briefly attained tropical storm intensity on Aug 12<sup>th</sup>, then re-attained it on Aug 15<sup>th</sup>
- Caused minimal damage to the Lesser Antilles, Puerto Rico and Dominican Republic

### ***Hurricane Bill***

**Maximum sustained winds:** 130 mph

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

**Lowest recorded pressure:** 943 mB

**Direct Fatalities:** 2

#### **Notes:**

- Strongest hurricane of the 2009 Atlantic Hurricane Season
- Fifth largest Atlantic tropical cyclone on record, with tropical force winds extending out 230 miles
- Developed from a tropical wave that emerged off the coast of Africa
- Impacted the U.S. northeast; causing extensive beach damage in Long Island, and heavy rain to portions of Cape Cod. Tropical storm force winds on New England Islands
- Made landfall on August 22<sup>nd</sup> as a tropical storm in Newfoundland

### ***Tropical Storm Claudette***

**Maximum sustained winds:** 50 mph

**Dates:** August 16<sup>th</sup> to August 18<sup>th</sup>

**Lowest recorded pressure:** 1006 mB

**Direct Fatalities:** 2

#### **Notes:**

- Claudette was the first tropical system of the 2009 season to make landfall in the U.S.
- Claudette formed out of a tropical wave and a low pressure system on August 16<sup>th</sup>, and quickly intensified into a tropical storm offshore near Tallahassee, Florida
- Claudette brought upwards of 6 inches of rain to portions of the Southeast U.S.

### ***Tropical Storm Danny***

**Maximum sustained winds:** 60 mph

**Dates:** August 26<sup>th</sup> to August 29<sup>th</sup>

**Lowest recorded pressure:** 1006 mB

**Direct Fatalities:** 1

#### **Notes:**

- On the morning of August 26<sup>th</sup>, Danny quickly brewed up off the Carolinas' coast
- By the 28<sup>th</sup>, the circulation of Danny became disorganized
- Rough surf was reported along U.S. beaches, and some portions of the U.S. Northeast had upwards of 4 inches of rain
- Damages were minor

### **Tropical Storm Erika**

**Maximum sustained winds:** 50 mph

**Dates:** September 1<sup>st</sup> to September 3<sup>rd</sup>

**Lowest recorded pressure:** 1004 mB

**Direct Fatalities:** 0

#### **Notes:**

- Erika was a short-lived tropical storm that had a minor impact in the Lesser Antilles
- Erika originated from a tropical wave on September 1<sup>st</sup>, and although it was a disorganized system, was immediately declared a tropical storm
- Guadeloupe recorded 8 inches of rain, which led to flooding and landslides; likewise, Puerto Rico received upwards of 7.5 inches of rain
- The system dissipated roughly 80 miles south of Puerto Rico

### **Hurricane Fred**

**Maximum sustained winds:** 120 mph

**Dates:** September 7<sup>th</sup> to September 12<sup>th</sup>

**Lowest recorded pressure:** 958 mB

**Direct Fatalities:** 10

#### **Notes:**

- Fred is the strongest storm in the past 158 years to attain major hurricane status (> Cat 2) east of 35° W., roughly 2,500 miles from the U.S.
- Fred originated from a strong tropical wave that moved off of Africa on September 6<sup>th</sup>
- On September 8<sup>th</sup> Fred attained hurricane intensity and quickly strengthened further
- Shortly after reaching peak intensity, Fred began to weaken as wind shear increased and dry air hampered convection
- Fred was never a threat to U.S. exposure

### **Tropical Storm Grace**

**Maximum sustained winds:** 70 mph

**Dates:** October 4<sup>th</sup> to October 6<sup>th</sup>

**Lowest recorded pressure:** 986 mB

**Direct Fatalities:** 0

#### **Notes:**

- Grace was a short-lived tropical cyclone that formed unusually far north and east in the Atlantic
- Grace impacted the Azores, although damage was minimal
- By the time Grace reached the U. K., its fast motion limited the rainfall amount
- Grace was among the northernmost formations of a tropical storm in the Atlantic on record

### **Tropical Storm Henri**

**Maximum sustained winds:** 50 mph

**Dates:** October 6<sup>th</sup> to October 8<sup>th</sup>

**Lowest recorded pressure:** 1005 mB

**Direct Fatalities:** 0

#### **Notes:**

- Henri was a short-lived storm that formed on October 6<sup>th</sup> about 700 miles northeast of Puerto Rico
- Henri weakened to a tropical depression after moving over cooler water on Oct. 7<sup>th</sup>

## **Hurricane Ida**

**Maximum sustained winds:** 105 mph

**Dates:** November 4<sup>th</sup> to November 10<sup>th</sup>

**Lowest recorded pressure:** 976 mB

**Direct Fatalities:** 10 (275 including El Salvador Flood)

### **Notes:**

- Ida developed in the far southwest Caribbean and quickly strengthened before making landfall in Nicaragua on November 6<sup>th</sup>, bringing up to 11 inches of rain
- Ida weakened over land, but went back to sea and strengthened to Category “2” by November 8<sup>th</sup>.
- Ida also contributed to the El Salvador floods and mudslides which caused close to 200 deaths
- Ida made landfall for a second time on the Alabama coastline at 8:00AM EST on November 10<sup>th</sup>, on a falling tide
- Ida became extratropical and became a strong nor’easter along the Mid Atlantic coast, bringing up to 12 inches of rain
- Ida was the most destructive U.S. storm of the 2009 hurricane season, causing moderate damage in several states

## 2. 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	
<b>14 Storms</b>	<b>5</b>	<b>4</b>	<b>7/31 - 12/2</b>	<b>150</b>	<b>935</b>	<b>9 U.S. landfalls</b>

**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	
<b>28 Storms</b>	<b>5 (3x)</b>	<b>4</b>	<b>6/8 - 1/6</b>	<b>175</b>	<b>882</b>	<b>9 U.S. landfalls</b>

**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	
<b>9 Storms</b>	<b>3 (2x)</b>	<b>6/10 - 10/2</b>	<b>125</b>	<b>954</b>	<b>3 U.S. landfalls</b>

**2007 Season details**

Storm	Highest Category	Dates	Maximum Winds (mph)	Minimum Pressure	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
Hurricane Dean	5	8/13 – 8/23	165	906	Costa Maya and Tuxpan, Mexico
Tropical Storm Erin	TS	8/14 – 8/19	40	1003	Lamar, TX
Hurricane Felix	5	8/31 – 9/5	165	929	Puerto Cabezas, Nicaragua
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 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
Hurricane Noel	I	10/27 – 11/2	80	980	Haiti, Cuba, Bahamas
Tropical Storm Olga	TS	12/10 – 12/12	45	1002	Puerto Rico
<b>15 Storms</b>	<b>5 (2x)</b>	<b>5/9 - 12/12</b>	<b>165</b>	<b>929</b>	<b>5 U.S. landfalls</b>

**2008 Season 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 passed near 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 August 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 and Caicos, Haiti and NC / SC Border	500+
Ike	4	September 1st to September 14th	145	935	Turks & Caicos, Bahamas, Haiti and Texas	80+ U.S., 500+ in total
Josephine	TS	September 2nd to September 5th	65	994	None	0
Kyle	2	September 25th to September 29th	80	984	Nova Scotia	4
Laura	TS	September 29th to October 1st	60	994	None	0
Marco	TS	October 6th to October 7th	65	998	S.E. Mexico	0
Nana	TS	October 12th to October 13th	40	1005	None	0
Omar	3	October 14th to October 18th	135	959	None	0
Paloma	4	November 6th to November 9th	145	943	Cuba	Likely high
<b>16 Storms</b>	<b>4 (3x)</b>	<b>5/31 - 11/9</b>	<b>150</b>	<b>935</b>	<b>9 U.S. landfalls</b>	<b>1,200 +</b>

### 3. Record Hurricanes

Rank	Insured Loss in Nominal Dollars			Insured Loss by Economic Impact			By U.S. Fatalities		
	Storm	Year	Amount	Storm	Year	% of GDP	Storm	Year	Number
1	Katrina	2005	\$65Bn	Katrina	2005	0.52%	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.

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