2012 NATURAL CATASTROPHE YEAR IN REVIEW

January 3, 2013
Welcome/Introduction
Terese Rosenthal

US Natural Catastrophe Update
Carl Hedde

Global Natural Catastrophe Update
Ernst Rauch

Economic Implications of Natural Catastrophe Losses
Dr. Robert Hartwig

Questions and Answers
You will have an opportunity to ask questions at the conclusion of the presentation.

To ask a question, please dial 1 4 on your phone.

An operator will facilitate your participation.

Live Tweeting

@iiiorg  @IWorter  #NATCAT2012
US NATURAL CATASTROPHE UPDATE

Carl Hedde, SVP, Head of Risk Accumulation
Munich Reinsurance America, Inc.
From 1980 until today all loss events; for USA and selected countries in Europe all loss events since 1970.

Retrospectively, all great disasters since 1950.

In addition, all major historical events starting from 79 AD – eruption of Mt. Vesuvius (3,000 historical data sets).

Currently more than 31,000 data sets
2012 Headlines

- Insured losses in the United States in 2012 totaled $57.9 billion – far above the 2000 to 2011 average loss of $27 billion (in 2012 Dollars).

- Hurricane Sandy makes landfall in New Jersey, becoming the worst storm to hit northeastern United States since the Great New England Hurricane of 1938, causing insured losses in excess of $25 billion.

- Despite a relatively quiet year for tornadoes, insured losses from thunderstorm events exceeded $14 billion, the second highest annual total on record.

- Severe drought cripples agriculture over large section of central United States.

- Dry conditions lead to the most damaging wildfires in Colorado history.
## Natural Disaster Losses in the United States 2012

<table>
<thead>
<tr>
<th>As of January 1, 2013</th>
<th>Number of Events</th>
<th>Fatalities</th>
<th>Estimated Overall Losses (US $m)</th>
<th>Estimated Insured Losses (US $m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Cyclone</td>
<td>4</td>
<td>143</td>
<td>52,240</td>
<td>26,360</td>
</tr>
<tr>
<td>Severe Thunderstorm</td>
<td>115</td>
<td>118</td>
<td>27,688</td>
<td>14,914</td>
</tr>
<tr>
<td>Drought</td>
<td>2</td>
<td>0</td>
<td>20,000</td>
<td>16,000†</td>
</tr>
<tr>
<td>Wildfire</td>
<td>38</td>
<td>13</td>
<td>1,112</td>
<td>595</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>2</td>
<td>7</td>
<td>81</td>
<td>38</td>
</tr>
<tr>
<td>Flood</td>
<td>19</td>
<td>3</td>
<td>13</td>
<td>0</td>
</tr>
</tbody>
</table>

† - Includes Federal Crop Insurance Losses.

Source: MR NatCatSERVICE
Natural Catastrophes in the USA 1980 – 2012

Number of events

2012 Total: 184 events

- Geophysical events (Earthquake, tsunami, volcanic eruption)
- Meteorological events (Storm)
- Hydrological events (Flood, mass movement)
- Climatological events (Extreme temperature, drought, forest fire)
Insured losses in the U.S. in 2012 were the second highest on record.
### Significant Natural Catastrophes, June – Sept 2012

$1 billion economic loss and/or 50 fatalities

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Estimated Economic Losses (US $m)</th>
<th>Estimated Insured Losses (US $m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June – Sept 2012</td>
<td>Central US Drought</td>
<td>20,000</td>
<td>16,000†</td>
</tr>
<tr>
<td>March 2 - 3</td>
<td>Thunderstorms</td>
<td>5,000</td>
<td>2,500</td>
</tr>
<tr>
<td>April 2 – 4</td>
<td>Thunderstorms</td>
<td>1,550</td>
<td>775</td>
</tr>
<tr>
<td>April 13- 15</td>
<td>Thunderstorms</td>
<td>1,800</td>
<td>910</td>
</tr>
<tr>
<td>April 28 – 29</td>
<td>Thunderstorms</td>
<td>4,500</td>
<td>2,500</td>
</tr>
<tr>
<td>May 25 – 30</td>
<td>Thunderstorms</td>
<td>3,400</td>
<td>1,700</td>
</tr>
<tr>
<td>June 6 – 7</td>
<td>Thunderstorms</td>
<td>1,400</td>
<td>1,000</td>
</tr>
<tr>
<td>June 11 – 13</td>
<td>Thunderstorms</td>
<td>1,900</td>
<td>950</td>
</tr>
<tr>
<td>June 28 – July 2</td>
<td>Thunderstorms</td>
<td>4,000</td>
<td>2,000</td>
</tr>
<tr>
<td>August 26 - 30</td>
<td>Hurricane Isaac</td>
<td>2,000</td>
<td>1,220</td>
</tr>
<tr>
<td>October 28 - 30</td>
<td>Hurricane Sandy</td>
<td>50,000</td>
<td>25,000</td>
</tr>
</tbody>
</table>

Source: MR NatCatSERVICE  
† - Includes Federal Crop Insurance Losses.
Eleven significant natural catastrophes occurred in the United States in 2011.
US TROPICAL CYCLONES 2012
US Hurricanes in 2012

Hurricane Isaac

- Landfalls on August 28 over the Mississippi River delta and Port Fourchon, Louisiana

- Minor to moderate wind damage in Louisiana and Mississippi, indirect wind damage due to tree fall further north.

- Storm surges up to 11 feet in some locations, but New Orleans levees held but some breached south of city; heavy rainfall caused significant inland flooding.

- Economic Losses in US of $2 billion, insured losses of $1.2 billion
Hurricane Sandy

- Landfalls on October 29 near Atlantic City, NJ
- Minor to moderate wind damage along coasts of NY and NJ, widespread indirect wind damage and power outages due to tree fall across 15 states.
- Record storm surge of 13.88 feet in Battery Park, NY and 15+ feet along New Jersey coast.
- Economic Losses in U.S. of $50 billion, insured losses of $25 billion
Impacts of Hurricane Sandy

Hurricane Sandy

- Add few more bullet points
Other US Tropical Cyclones in 2012

Tropical Storm Beryl
- Landfall on May 28 near Jacksonville, Florida as a tropical storm with sustained winds of 70 mph; strongest May tropical storm ever to make US landfall.
- Minor wind damage and flooding in Florida and Georgia.

Tropical Storm Debby
- Landfall on June 26 near Steinhatchee, Florida as a tropical storm with sustained winds of 40 mph.
- Torrential rains of up to 25” caused extensive flooding in the Florida Panhandle, with lesser flooding elsewhere in the state.
There has not been a major hurricane landfall in the US since Wilma in 2005.
The current 5-year average (2007-2012) insured tropical cyclone loss is $8.9 billion per year.
2012 US THUNDERSTORM SEASON
United States Annual Trend of LSR Tornadoes*

*Preliminary tornadoes from NWS Local Storm Reports (LSRs)
Annual average is based on preliminary LSRs, 2005-2011
Notable Thunderstorm Events
Second Half 2012

- **June 28 – July 2**: Long-lived derecho (straight-line windstorm) causes extensive wind damage from Indiana to Maryland. Millions were without power for days. US$ 2 billion insured loss.

- **December 25 - 26**: Tornado outbreak in deep south along a strong cold front. Over 51 tornadoes reported. Insured losses to be determined.
Average thunderstorm losses have increased sevenfold since 1980.
OTHER US NATURAL CATASTROPHES IN 2012
Current US Drought Conditions

U.S. Drought Monitor

December 25, 2012
Valid 7 a.m. EST

Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
- Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu/

Released Thursday, December 27, 2012
Author: Richard Heim, NOAA/NESDIS/NCDC
Worst drought in at least 25 years, dry to severe drought conditions affected over 1,600 counties across 36 states at its peak – over 60% of the United States.

Severe damage to crops (soybeans, corn) and livestock

Low water levels along Mississippi River disrupted shipping.

Economic Losses are estimated at $20 billion.
Number of Acres Burned in Wildfires, 1980 – 2012

Source: National Interagency Fire Center
Notable Wildfires in 2012

- **Colorado**: “High Park” fire near Fort Collins destroyed 257 homes and “Waldo Canyon” fire near Colorado Springs destroyed over 300 homes, becoming the most damaging fire in state history. Insured losses from both fires are estimated at $450 million.

- **New Mexico**: “Whitewater-Baldy” fire scorched over 278,000 acres over May and June, becoming the largest wildfire in state history, but with minimal insurance impacts.

Source: USFS
• Insured losses in the United States in 2012 totaled $57.9 billion – far above the 2000 to 2011 average loss of $27 billion (in 2012 Dollars).

• Hurricane Sandy makes landfall in New Jersey, becoming the worst storm to hit northeastern United States since the Great New England Hurricane of 1938, causing insured losses in excess of $25 billion.

• Despite a relatively quiet year for tornadoes, insured losses from thunderstorm events exceeded $14 billion, the second highest annual total on record.

• Severe drought cripples agriculture over large section of central United States.

• Dry conditions lead to the most damaging wildfires in Colorado history.
NATURAL CATASTROPHES WORLDWIDE

Ernst Rauch
Head of Corporate Climate Centre
Munich Re
# Natural catastrophes worldwide 2012

**Significant events**

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Event Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane Sandy, USA, Caribbean</td>
<td>Record storm surge, New York City severely affected</td>
<td>With estimated 25bn US$ insured losses is Sandy the second costliest storm after Hurricane Katrina (62bn US$ in today’s values).</td>
</tr>
<tr>
<td>Drought, USA</td>
<td>2012 was - until November 2012 - the warmest year in the US</td>
<td>Losses in agriculture, infrastructure and navigation.</td>
</tr>
<tr>
<td>Earthquakes, Italy</td>
<td>Series of earthquakes in Northern Italy. Strongest earthquakes: 20 May: magnitude 5.9 29 May magnitudes 5.8</td>
<td>The Emilia Romagna earthquakes are with 1.6bn US$ the costliest losses for the Italian insurance industry.</td>
</tr>
<tr>
<td>Series of tornadoes, USA</td>
<td>Early start of the tornado season.</td>
<td>From March until April insured losses due to thunderstorms and tornadoes amounted to 7bn US$.</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013

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Natural catastrophes worldwide 2012

Facts

**Number of events: 900**
- The number is well above the 10-year-average (2002-2011: 800).

**Fatalities: 9,500**
- The number is very low in comparison with previous years (2002-2011: 106,000).
- The deadliest event was Typhoon Bopha in the Philippines, with more than 1,000 deaths.

**Overall direct losses: US$ 160bn**

**Insured losses: US$ 65bn**
- The insured losses are above the 10-year-average (US$ 50bn).
- 2012 is the third costliest year for the insurance industry worldwide (after 2011 and 2005) and the second costliest year in US (after 2005).

Source: Geo Risks Research, NatCatSERVICE – As at January 2013

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Global Natural Catastrophe Update

Natural catastrophes worldwide 1980 – 2012

Number of events

Source: Geo Risks Research, NatCatSERVICE – As at January 2013

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Global Natural Catastrophe Update

Natural catastrophes worldwide 1980 – 2012

Overall and insured losses

Source: Geo Risks Research, NatCatSERVICE – As at January 2013

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Natural catastrophes worldwide 2012
Percentage distribution

905 Loss events

- Meteorological events (Storm) 45%
- Hydrological events (Flood, mass movement) 36%
- Climatological events (Extreme temperature, drought, forest fire) 12%
- Geophysical events (Earthquake, tsunami, volcanic eruption) 7%

9,600 Fatalities

- Meteorological events (Storm) 48%
- Hydrological events (Flood, mass movement) 18%
- Climatological events (Extreme temperature, drought, forest fire) 7%

Overall losses* US$ 160bn

- Meteorological events (Storm) 63%
- Hydrological events (Flood, mass movement) 14%
- Climatological events (Extreme temperature, drought, forest fire) 13%
- Geophysical events (Earthquake, tsunami, volcanic eruption) 10%

Insured losses* US$ 65bn

- Meteorological events (Storm) 83%
- Hydrological events (Flood, mass movement) 3%
- Climatological events (Extreme temperature, drought, forest fire) 11%
- Geophysical events (Earthquake, tsunami, volcanic eruption) 1%

*in 2012 values

Source: Geo Risks Research, NatCatSERVICE – As at January 2013

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### Natural catastrophes worldwide 2012

The five costliest natural catastrophes for the insurance industry

<table>
<thead>
<tr>
<th>Date</th>
<th>Region</th>
<th>Event</th>
<th>Fatalities</th>
<th>Insured losses US$ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-31.10.2012</td>
<td>USA, Caribbean</td>
<td>Hurricane Sandy</td>
<td>220</td>
<td>25,000</td>
</tr>
<tr>
<td>June-Sept.</td>
<td>USA</td>
<td>Drought</td>
<td></td>
<td>15,000-17,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>agriculture losses / average year approx. 9bn</td>
</tr>
<tr>
<td>2-4.3.2012</td>
<td>USA</td>
<td>Severe storms, tornadoes</td>
<td>41</td>
<td>2,500</td>
</tr>
<tr>
<td>28-29.4.2012</td>
<td>USA</td>
<td>Severe storms, tornadoes</td>
<td>350</td>
<td>2,500</td>
</tr>
<tr>
<td>28.6-2.7.2012</td>
<td>USA</td>
<td>Severe storms, tornadoes</td>
<td>18</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013
Global Natural Catastrophe Update

Natural catastrophes worldwide 2012
Insured losses US$ 65bn - Percentage distribution per continent

<table>
<thead>
<tr>
<th>Continent</th>
<th>Insured losses US$ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>America (North and South America)</td>
<td>60,000</td>
</tr>
<tr>
<td>Europe</td>
<td>3,200</td>
</tr>
<tr>
<td>Africa</td>
<td>200</td>
</tr>
<tr>
<td>Asia</td>
<td>1,700</td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td>300</td>
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Source: Geo Risks Research, NatCatSERVICE – As at January 2013
© 2013 Munich Re
Natural catastrophes worldwide 2012

Insured losses US$ 65bn - Percentage distribution per continent

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<td>Asia</td>
<td>1,700</td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td>300</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013
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Natural catastrophes worldwide 2012
Overall losses US$ 160bn - Percentage distribution per continent

<table>
<thead>
<tr>
<th>Continent</th>
<th>Overall losses US$ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>America (North and South America)</td>
<td>110,000</td>
</tr>
<tr>
<td>Europe</td>
<td>21,000</td>
</tr>
<tr>
<td>Africa</td>
<td>1,000</td>
</tr>
<tr>
<td>Asia</td>
<td>26,000</td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013
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Global Natural Catastrophe Update

Natural Catastrophes 2012

World map

Number of events: 905

- Natural catastrophes
  - Geophysical events (earthquake, tsunami, volcanic activity)
  - Meteorological events (storm)
  - Hydrological events (flood, mass movement)
  - Climatological events (extreme temperature, drought, wildfire)

Source: Geo Risks Research, NatCatSERVICE – As at January 2013 © 2013 Munich Re
# Earthquakes Italy

**May 2012**

**Costliest insured loss 2012 outside US**

<table>
<thead>
<tr>
<th>Region</th>
<th>Overall losses</th>
<th>Insured losses</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Italy, Emilia Romagna</td>
<td>US$ 16bn</td>
<td>US$ 1.6bn</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013
Typhoon Bopha, Philippines 4 – 5 December 2012

Deadliest event of 2012

<table>
<thead>
<tr>
<th>Region</th>
<th>Overall losses</th>
<th>Insured losses</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Philippines</td>
<td>US$ 600m</td>
<td>minor</td>
<td>1,100</td>
</tr>
</tbody>
</table>

Source: Geo Risks Research, NatCatSERVICE – As at January 2013
Summary

90% of total insured losses worldwide (US$ 65bn) were attributable to the U.S. (long-term average is = 57%)

Hurricane Sandy and the U.S. drought were the costliest events

The earthquakes in Italy in May were the costliest insured losses in Italy until today

2011 was a year with no catastrophic events in terms of loss of lives, however, it was the third costliest year for the insurance industry (after 2005 and 2011) and the second costliest for the U.S. (after 2005)
Market & Financial Impact of Catastrophe Loss: 
Full Year 2012

Insurance Information Institute
January 3, 2013

Robert P. Hartwig, Ph.D., CPCU, President & Economist
Insurance Information Institute ◆ 110 William Street ◆ New York, NY 10038
Tel: 212.346.5520 ◆ Cell: 917.453.1885 ◆ bobh@iii.org ◆ www.iii.org
P/C Insurance Industry
Financial Overview

Industry Was Very Strong
When Sandy Struck;
Financial Strength Remains
Intact for 2013
P/C Net Income After Taxes
1991—2012:Q3 ($ Millions)

- 2005 ROE* = 9.6%
- 2006 ROE = 12.7%
- 2007 ROE = 10.9%
- 2008 ROE = 0.1%
- 2009 ROE = 5.0%
- 2010 ROE = 6.6%
- 2011 ROAS1 = 3.5%
- 2012:Q3 ROAS1 = 6.3%

P-C Industry 2012:Q3 profits were up 222% from 2011:Q3, due primarily to lower catastrophe losses

* ROE figures are GAAP; 1Return on avg. surplus. Excluding Mortgage & Financial Guaranty insurers yields a 6.6% ROAS through 2012:Q3, 4.6% ROAS for 2011, 7.6% for 2010 and 7.4% for 2009.

Sources: A.M. Best, ISO, Insurance Information Institute
A 100 Combined Ratio Isn’t What It Once Was: Investment Impact on ROEs

A combined ratio of about 100 generates an ROE of ~6.6% in 2012, ~7.5% ROE in 2009/10, 10% in 2005 and 16% in 1979.

Combined Ratios Must Be Lower in Today’s Depressed Investment Environment to Generate Risk Appropriate ROEs

* 2008 - 2012 figures are return on average surplus and exclude mortgage and financial guaranty insurers. 2012:Q3 combined ratio including M&FG insurers is 100.9, ROAS = 6.3%; 2011 combined ratio including M&FG insurers is 108.2, ROAS = 3.5%.
Source: Insurance Information Institute from A.M. Best and ISO data.
Profitability Peaks & Troughs in the P/C Insurance Industry, 1975 – 2012:Q3*

History suggests next ROE peak will be in 2016-2017

*Profitability = P/C insurer ROEs. 2011 figure is an estimate based on ROAS data. Note: Data for 2008-2012 exclude mortgage and financial guaranty insurers. 2012:Q3 ROAS = 6.2% including M&FG.

Source: Insurance Information Institute; NAIC, ISO, A.M. Best.
Industry Claims Paying Capital Was at a Record High When Hurricane Sandy Struck; Capacity Remains Close to Historic Highs for 2013; 

No “Fiscal Cliff” in the P/C (Re)Insurance Industry

Sources: ISO, A.M. Best.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Surplus ($ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06:Q4</td>
<td>$487.1</td>
</tr>
<tr>
<td>07:Q1</td>
<td>$496.6</td>
</tr>
<tr>
<td>07:Q2</td>
<td>$512.8</td>
</tr>
<tr>
<td>07:Q3</td>
<td>$517.5</td>
</tr>
<tr>
<td>08:Q1</td>
<td>$515.6</td>
</tr>
<tr>
<td>08:Q2</td>
<td>$505.0</td>
</tr>
<tr>
<td>08:Q3</td>
<td>$478.5</td>
</tr>
<tr>
<td>09:Q1</td>
<td>$455.6</td>
</tr>
<tr>
<td>09:Q2</td>
<td>$437.1</td>
</tr>
<tr>
<td>09:Q3</td>
<td>$463.0</td>
</tr>
<tr>
<td>10:Q1</td>
<td>$490.8</td>
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<tr>
<td>10:Q2</td>
<td>$511.5</td>
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<td>10:Q3</td>
<td>$530.5</td>
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<tr>
<td>10:Q4</td>
<td>$544.8</td>
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<td>11:Q1</td>
<td>$559.2</td>
</tr>
<tr>
<td>11:Q2</td>
<td>$550.3</td>
</tr>
<tr>
<td>11:Q3</td>
<td>$567.8</td>
</tr>
<tr>
<td>11:Q4</td>
<td>$583.5</td>
</tr>
<tr>
<td>12:Q1</td>
<td>$538.6</td>
</tr>
<tr>
<td>12:Q2</td>
<td>$570.7</td>
</tr>
<tr>
<td>12:Q3</td>
<td>$583.5</td>
</tr>
</tbody>
</table>

2007:Q3 Pre-Crisis Peak

Surplus as of 9/30/12 was up $12.8B or 2.2% from the previous record high of $570.7B set as of 3/31/12.

The Industry now has $1 of surplus for every $0.80 of NPW, close to the strongest claims-paying status in its history.

Drop due to near-record 2011 CAT losses

*Includes $22.5B of paid-in capital from a holding company parent for one insurer’s investment in a non-insurance business in early 2010.

The P/C Insurance Industry Both Entered and Emerged from the 2012 Hurricane Season Very Strong Financially. There is No Insurance Industry “Fiscal Cliff”

Sources: ISO, A.M. Best.
Catastrophe Losses Impact Trajectory of Premium Growth

(Percent)

1975-78  1984-87  2000-03

Net Written Premiums Fell 0.7% in 2007 (First Decline Since 1943) by 2.0% in 2008, and 4.2% in 2009, the First 3-Year Decline Since 1930-33.

2012:Q3 growth was +4.2%

Shaded areas denote “hard market” periods
Sources: A.M. Best (historical and forecast), ISO, Insurance Information Institute.
Sustained Growth in Written Premiums (vs. the same quarter, prior year) Will Continue into 2013

Premium growth in Q3 2012 was up 5.1% over Q3 2011, the strongest growth since Q4 2006

Sources: ISO, Insurance Information Institute.

*Excludes mortgage and financial guaranty insurers.

Source: ISO/PCI; Insurance Information Institute
Underwriting Losses in 2012 (and 2011) Were Elevated by High Catastrophe Losses
As Recently as 2001, Insurers Paid Out Nearly $1.16 for Every $1 in Earned Premiums

Heavy Use of Reinsurance Lowered Net Losses

Relatively Low CAT Losses, Reserve Releases

Relatively Low CAT Losses, Reserve Releases

Higher CAT Losses, Shrinking Reserve Releases, Toll of Soft Market

Best Combined Ratio Since 1949 (87.6)

Cyclical Deterioration

Avg. CAT Losses, More Reserve Releases

Lower CAT Losses Before Sandy

Underwriting Gain (Loss) 1975–2012:Q3*

Cumulative underwriting deficit from 1975 through 2011 is $479B

Underwriting losses through 2012:Q3 totaled $6.7B

High cat losses in 2011 led to the highest underwriting loss since 2002

Large Underwriting Losses Are NOT Sustainable in Current Investment Environment

* Includes mortgage and financial guaranty insurers in all years.
Sources: A.M. Best, ISO; Insurance Information Institute.
The combined ratios for both personal and commercial lines improved substantially through 2012:Q3, prior to Hurricane Sandy.

*Excludes mortgage and financial guaranty insurers.

Source: ISO/PCI; Insurance Information Institute

<table>
<thead>
<tr>
<th>Segment</th>
<th>2011:9M</th>
<th>2012:9M</th>
</tr>
</thead>
<tbody>
<tr>
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Depressed Yields Will Necessarily Influence Underwriting & Pricing
Investment Income Fell in 2012 Due to Persistently Low Interest Rates, Putting Additional Pressure on (Re) Insurance Pricing

1 Investment gains consist primarily of interest and stock dividends.
*2012F is based on annualized 9M:2012 actual figure of $35.131B.
Sources: ISO; Insurance Information Institute.
Hurricane Sandy Summary

Sandy Will Become One of the Most Expensive Events in Insurance History
Hurricane Sandy Insured Loss Estimates: Late Season Large Loss* ($ Billions)

Average of the midpoints of the 3 risk modeler estimates is $18.8 billion

Sources: RMS (11/14/12 est.), AIR (11/26/12 est.), Eqecat (11/1/12 est.); Compiled by the Insurance Information Institute.
Top 12 Most Costly Hurricanes in U.S. History

(Insured Losses, 2012 Dollars, $ Billions)

10 of the 12 most costly hurricanes in insurance history occurred over the past 8 years (2004—2012)

Hurricane Sandy could become the 3rd costliest hurricane in US insurance history

Hurricane Irene became the 12th most expense hurricane in US history in 2011

*Estimate as of 12/09/12 based on average of current range estimate midpoints from AIR, Eqecat and RMS; Excludes NFIP.
Sources: PCS; Insurance Information Institute inflation adjustments to 2012 dollars using the CPI.
Top 16 Most Costly World Insurance Losses, 1970-2012*

(Insured Losses, 2012 Dollars, $ Billions)

5 of the top 14 most expensive catastrophes in world history have occurred within the past 3 years

Hurricane Sandy could become the 6th costliest event in global (private) insurance history

*Figures do not include federally insured flood losses.

**Average of range estimates of $35B - $40B as of 1/4/12 adjusted to 2012 dollars; Privately insured losses only.

***Estimate as of 12/09/12, based on average of midpoints from range estimates from AIR, RMS and Eqecat.

Sources: Swiss Re sigma 1/2011; Munich Re; Insurance Information Institute research.
Top 16 Most Costly Disasters in U.S. History

(Insured Losses, 2012 Dollars, $ Billions)

Hurricane Sandy could become the 5th costliest event in US insurance history

Hurricane Irene became the 12th most expense hurricane in US history in 2011

NY Gov. Andrew Cuomo has requested $42 billion in federal aid. NJ Gov. Chris Christie has requested $29.4B.

*Estimate as of 12/09/12 based on average of range midpoints from AIR, RMS and Eqecat.
Sources: PCS; Insurance Information Institute inflation adjustments.
US CAT Losses in 2012 Could Become the 2\textsuperscript{nd} or 3\textsuperscript{rd} Highest in US History on An Inflation-Adjusted Basis (Pvt Insured). 2011 Losses Were the 5\textsuperscript{th} Highest

*As of 1/2/13. Includes $18.8B gross loss estimate for Hurricane Sandy.

Note: 2001 figure includes $20.3B for 9/11 losses reported through 12/31/01 ($25.9B 2011 dollars). Includes only business and personal property claims, business interruption and auto claims. Non-prop/BI losses = $12.2B ($15.6B in 2011 dollars.)

Sources: Property Claims Service/ISO; Insurance Information Institute.
Hurricane Sandy resulted in an estimated 1.38 million privately insured claims resulting in an estimated $10 to $25 billion in insured losses. Hurricane Katrina produced 1.74 million claims and $47.6B in losses (in 2011 $).

*PCS claim count estimate as of 11/26/12. Loss estimate represents high and low end estimates by risk modelers RMS, Eqecat and AIR. PCS estimate of insured losses as of 11/26/12 $11 billion. All figures exclude losses paid by the NFIP.

Source: PCS; AIR, Eqecat, AIR Worldwide; Insurance Information Institute.
Hurricane Sandy: Number of Homeowners Claims by State*

- **New Jersey,** 360,000 , 36%
- **New York,** 330,000 , 34%
- **All Other,** 292,000 , 30%

---

**Hurricane Sandy**

- Estimated 982,000 homeowners claims**
- $6.6 billion in insured losses.
- Average loss per claim is $6,718
- About 1/3 of claims in NY, 1/3 in NJ and 1/3 in all other states

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*Preliminary as of 11/26/12.
Source: PCS.
Hurricane Sandy: Value of Homeowners Claims Paid, by State* ($ Millions)

- **New Jersey**, $2,500, 38%
- **New York**, $2,300, 35%
- **All Other**, $1,797, 27%

*Preliminary as of 11/26/12.
Source: PCS.

**Hurricane Sandy**

- Estimated 982,000 homeowners claims**
- $6.6 billion in insured losses.
- Average loss per claim is $6,718
- Claims in NJ estimated at $2.5 billion (38%) and $2.3 billion in NY (35%)
Hurricane Sandy: Number of Auto Claims by State*

- New York, 130,000, 56%
- New Jersey, 60,000, 26%
- All Other, 40,500, 18%

*Preliminary as of 11/26/12.
Source: PCS.

Hurricane Sandy
- Estimated 230,500 vehicle claims
- $779 million in insured losses.
- Average loss per claim is $3,380
- Nearly 60% of the claims occurred in NY state.
Hurricane Sandy: Value of Auto Claims Paid, by State* ($ Millions)

- **New York, $400, 51%**
- **New Jersey, $250, 32%**
- **All Other, $129, 17%**

*Preliminary as of 11/26/12.

Source: PCS.

**Hurricane Sandy**
- Estimated 230,500 vehicle claims
- $779 million in insured losses.
- Average loss per claim is $3,380
- About 50% of the claim dollars will be paid in NY, 32% in NJ.
Flood Loss Paid by the National Flood Insurance Program, 1980-2012E

Billions (Original Values)

*Estimate as of 11/25/12.

Hurricanes Katrina and Rita accounted for the majority of 2005’s record $17.4B payout

Hurricane Sandy and other events could result in $7.5 billion in payouts from the NFIP in 2012, second only to 2005 and potentially exhausting the NFIP’s borrowing authority.
Flood coverage penetration rates were extremely low in many very vulnerable areas in NJ, with take-up rates far below 50% in many areas.
Flood coverage penetration rates were extremely low in many very vulnerable areas of NY and CT, with take-up rates far below 50% in many areas.
Federal Aid Requests for States With Greatest Sandy Impact & Federal Aid Proposals (as of 1/2/13)

- **New York**: $42.0 (Repair: $33.0, Mitigation/Prevention: $9.0)
- **New Jersey**: $36.9 (Repair: $29.5, Mitigation/Prevention: $7.4)
- **Connecticut**: $3.2
- **Obama Administration Proposal (Dec. 28)**: $60.4
- **Senate Proposal (Jan. 2)**: $60.2
- **House Proposal (Jan. 2)**: $51.0 (House vote scheduled for Jan. 15)

**States Requested Enormous Sums in Sandy Aid in the Middle of the “Fiscal Cliff” Debate, Causing Delays**

- $33B to repair subways, hospitals and other facilities; $9B to upgrade infrastructure against future storms
- $39.5B to repair schools, roads, bridges, businesses, homes and other facilities; $7.4B to for mitigation and prevention against future storms
- $3.2B to bury power lines, upgrade transmission systems, build sewage treatment plants and other mitigation projects

Before Sandy Struck, Privately Insured Catastrophe Losses Were Down 51% from 2011 Levels
Number of Tornadoes and Related Deaths, 1990 – 2012*

Tornadoes claimed 553 lives in 2011, the most since 1925.

1,064 tornadoes have been recorded so far this year, 68 deaths.*

2012 Tornado Losses Got Off to an Ominous Beginning, but Slowed. Insured Losses from Tornadoes and Thunderstorms in 2012 Totaled $14.9B.


U.S. Tornado Count, Departure from Inflation-Adjusted Running Total, 2011 vs. 2012*


2011 count was far above average

2012 count was below average, but damages were still high

Source: http://www.spc.noaa.gov/wcm/
Location of Tornadoes in the US, 2012*

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2012_annual_summary.html#
1,894 tornadoes killed 553 people in 2011, including at least 340 on April 26 mostly in the Tuscaloosa area, and 130 in Joplin on May 22.
There were 7,022 “Large Hail” reports through Dec. 19, 2012, causing extensive damage to homes, businesses and vehicles.
There were 9,417 “Large Hail” reports in 2011, causing extensive damage to homes, businesses and vehicles.

Location of Wind Damage Reports in the US, 2012*

There were 14,043 “Wind Damage” reports through Dec. 19, causing extensive damage to homes and businesses.

Extreme density due to late June derecho

Hurricane Sandy resulted in a large volume of wind damage reports

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2012_annual_summary.html#
There were 18,685 “Wind Damage” reports through Dec. 27, causing extensive damage to homes and businesses.
There were 22,131 severe weather reports through Dec. 19; including 1,066 tornadoes; 7,022 “Large Hail” reports and 14,043 high wind events.

Source: NOAA Storm Prediction Center; [http://www.spc.noaa.gov/climo/online/monthly/2012_annual_summary.html](http://www.spc.noaa.gov/climo/online/monthly/2012_annual_summary.html)
Severe Weather Reports, 2011

There were 29,996 severe weather reports in 2011; including 1,894 tornadoes; 9,417 “Large Hail” reports and 18,685 high wind events.

Number of Severe Weather Reports in US by Type, 2012

- Wind Damage, 14,043, 63%
- Large Hail, 7,022, 32%
- Tornadoes, 1,066, 5%


Tornadoes accounted for just 5% of all Severe Weather Reports in 2012 compared to 6% in 2011, though they caused less damage and far fewer deaths.
Insurance Information Institute Online:

www.iii.org

Thank you for your time and your attention!

Twitter: twitter.com/bob_hartwig
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Press Inquiries
Terese Rosenthal
Phone: +1 (609) 243-4339
E-mail: trosenthal@munichreamerica.com
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Natural Catastrophes in North America
Perils, Risks and Insurance

Contents

- Perils
- Risks
  - Climate change and climate variability
  - Risk map of North America
- Insurance
  - Insurance aspects in the United States and Canada
  - Agricultural insurance
  - Weather derivatives
- Message to the Market
## More Information

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