The Business Case for Building More Resilient Communities
Lessons Learned from Major Catastrophes

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Natural Disasters Global and US – Historical Overview
Natural Disasters Worldwide, 1980 – 2013 (Number of Events)

There were 880 natural disaster events globally in 2013 compared to 905 in 2012

Source: MR NatCatSERVICE
Losses Due to Natural Disasters Worldwide, 1980–2013
(Overall & Insured Losses)

10-Yr. Avg. Losses
Overall: $184B
Insured: $56B

2013 Losses
Overall: $125B
Insured: $34B

There is a clear upward trend in both insured and overall losses over the past 30+ years.

Source: MR NatCatSERVICE
Natural Loss Events: Full Year 2013


- **Extraterrestrial events** (Meteorite impact)
  - Meteorite impact
    - Russian Federation, 15 February
  - Flash floods
    - Russian Federation, 15 February

- **Geophysical events** (earthquake, tsunami, volcanic activity)
  - Earthquake
    - Pakistan, 24–28 September
  - Earthquake
    - China, 20 April
  - Typhoon Fitow
    - China, Japan, 5–9 October
  - Typhoon Haiyan
    - Philippines, 8–12 November

- **Meteorological events** (storm)
  - Severe storms, tornadoes
    - USA, 18–22 May
  - Severe storms, tornadoes
    - USA, 28–31 May
  - Winter Storm Christian (St. Jude)
    - Europe, 27–30 October
  - Hailstorms
    - Germany, 27–28 July

- **Hydrological events** (flood, mass movement)
  - Floods
    - Canada, 8–9 July
  - Floods
    - Canada, 19–24 June
  - Floods
    - USA, 8–17 September
  - Floods
    - Europe, 30 May–19 June
  - Floods
    - India, 14–30 June
  - Floods
    - Europe, 30 May–19 June
  - Floods
    - Australia, 21–31 January
  - Floods
    - India, 14–30 June
  - Floods
    - USA, 9–16 September
  - Floods
    - India, 19–24 June
  - Floods
    - Europe, 30 May–19 June

- **Climatological events** (extreme temperature, drought, wildfire)
  - Heat wave
    - India, April–June

- **Selection of significant Natural catastrophes**
  - Hurricanes Ingrid & Manuel
    - Mexico, 12–19 September

- **880 Loss events**
Natural Disasters in the United States
Number of Events (Annual Totals 1980 – 2013)

There were 128 natural disaster events in 2013.
Losses Due to Natural Disasters in the U.S., 1980–2013
(Overall and Insured Losses)

(2013 Dollars, $ Billions)

- 2013 losses were far below 2011 and 2012 and were 44% lower than the average from 2000-2012
- Indicates a great deal of losses are uninsured (~40%-50% in the US) = Growth Opportunity

2013 CAT Losses
Overall: $21.8B
Insured: $12.8B

Overall losses (in 2012 values) | Insured losses (in 2013 values)
2012 was the third most expensive year ever for insured CAT losses.

2012 was the 3\textsuperscript{rd} Highest Year on Record for Insured Losses in U.S. History on an Inflation-Adj. Basis. 2011 Losses Were the 6\textsuperscript{th} Highest. YTD 2013 Running Well Below 2011 and 2012 YTD Totals.

*Through 12/31/13.

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.
Inflation Adjusted U.S. Catastrophe Losses by Cause of Loss, 1993–2012

- Wind/Hail/Flood (3), $14.9
- Geological Events, $18.4
- Terrorism, $24.8
- Winter Storms, $27.8
- Hurricanes & Tropical Storms, $158.2
- Tornadoes (2), $140.9
- Fires (4), $6.5
- Other (5), $0.2

Wind losses are by far cause the most catastrophe losses, even if hurricanes/TS are excluded.

Tornado share of CAT losses is rising

Insured cat losses from 1993-2012 totaled $391.7B, an average of $19.6B per year or $1.6B per month

Source: ISO’s Property Claim Services Unit.

- Catastrophes are defined as events causing direct insured losses to property of $25 million or more in 2012 dollars.
- Excludes snow.
- Does not include NFIP flood losses
- Includes wildland fires
- Includes civil disorders, water damage, utility disruptions and non-property losses such as those covered by workers compensation.
Total Value of Insured Coastal Exposure in 2012

(2012, $ Billions)

New York: $2,923.1
Florida: $2,862.3
Texas: $1,175.3
Massachusetts: $849.6
New Jersey: $713.9
Connecticut: $567.8
Louisiana: $293.5
S. Carolina: $239.3
Virginia: $182.3
Maine: $164.6
North Carolina: $163.5
Alabama: $118.2
Georgia: $106.7
Delaware: $81.9
New Hampshire: $64.0
Mississippi: $60.6
Rhode Island: $58.3
Maryland: $17.3

NY and FL lead the US in the value of insured coastal exposure at $2.9 Trillion.

In 2012, New York Ranked as the #1 Most Exposed State to Hurricane Loss, Overtaking Florida with $2.862 Trillion. Texas is very exposed too, and ranked #3 with $1.175 Trillion in insured coastal exposure.

The Insured Value of All Coastal Property Was $10.6 Trillion in 2012, Up 20% from $8.9 Trillion in 2007 and Up 48% from $7.2 Trillion in 2004.

Source: AIR Worldwide
Top 12 Most Costly Hurricanes in U.S. History

10 of the 12 most costly hurricanes in insurance history occurred over the past 9 years (2004—2012)

(Insured Losses, 2012 Dollars, $ Billions)

Hurricane Sandy became the 3rd costliest hurricane in US insurance history

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

*PCS estimate as of 4/12/13.

Sources: PCS; Insurance Information Institute inflation adjustments to 2012 dollars using the CPI.
Hurricane Sandy
Storm Case Study

Pre-Sandy
Storm Case Study

Post-Sandy
What Happened
Sandy at a Glance

- On Monday October 29, 2012 Superstorm Sandy made landfall just south of Atlantic City with winds in excess of 80 mph
- Largest hurricane ever to hit the mid-Atlantic and Northeast regions of the United States
  - Winds extending 580 miles from the center approximately 1,000 miles wide (twice the size of Texas)
  - Delivered over 12” of rain in certain areas of the northeast over a 36 hour span
  - Massive flooding throughout the NY Metro area
What Happened
Sandy at a Glance

- Storm surge reached 12.5 ft in some areas
- Storm surge level at Battery Park was nearly 4 feet higher than the record set by Hurricane Donna in 1960
  - Peak surge of the storm hit within 30 minutes of high tide
  - Full moon
- Sandy was more than double the size of Katrina in diameter and affected over 2.5M more people
Economic Losses
Quantifying the Devastation

- Over 8.6MM people lost power according to the US Dept of Energy
- At least 110 confirmed deaths in the United States
- According to FEMA, the assistance to NY, NJ and CT will total more than $455M
- NYSE closed for 2 days
  - First time since 1888 that this happened due to a weather event
- Almost 20,000 flights cancelled accordingly to FlightAware
Insurable Losses
Quantifying the Devastation

- Insured Losses topped $20B, Sandy is the second most expensive hurricane in history, trailing only Hurricane Katrina’s $41.1B.

- Based on density population, the volume of claims reported broke industry records in personal and commercial insurance markets.
  - NY Metro region has the highest population density in the country.
  - Population affected by Sandy is over 17.5M (compared to 15M in Katrina).

- More than 70,000 property owners filed claims with NFIP according to FEMA.

Issues Facing Real Estate Firms
Areas of Concern – Rebuild & Recover After Sandy

- **Lease Review and Contract Certainty**
  - Rent abatement and lease termination clauses
    - Loss of rent or extended business interruption
    - Marketing to prospective tenants
    - Possibility for reimbursement only up to 12 months
  - Every lease is different

- **Increased cost of construction in NYC**
  - Highest in nation
  - High demand but low supply – demand surge for contractors and materials
  - Loss Invoices were higher than under normal industry conditions

- **Rebuilding and Code Issues**
  - Reconstruction permits and enforcement of stringent building codes:
    - American with Disabilities Act (ramps, elevators, restrooms)
    - Electrical. Sprinklers, Roof/Structural
    - Generators to higher floors

- **Redevelopment of Coastal/Waterfront Areas**
  - New code
  - Mayor Bloomberg Report on Sandy
Insurance Market Impact
How Sandy Will Affect the Insurance Marketplace

- Analytical Modeling – shift due to Sandy and Irene
  - Tier 1 & Tier 2 Counties
  - Wind models traditionally focused on Florida and Texas
  - Northeast coastal exposures have greater focus post Sandy & Irene

- Lenders and Loan Covenants
  - Loan Covenants have increased focus on mandated windstorm and flood coverage within the NY Metro area and Northeast

- Pricing
  - Underwriters may look for price adjustments in conjunction with deductible increases
  - Portfolio allocations may change dramatically in the Mid-Atlantic/Northeast

- Business Continuity Planning and Hurricane Preparedness

- Insurance and Reinsurance Market Conditions
  - Capital & Surplus has reached record levels in 2014
  - New RMS PML Models released in 2013
  - 2013 benign Hurricane Season
  - Windstorm risk including Northeast Wind is a focus as well as flooding risk
Reinsurance/Insurance Industry Analytics
Regional Property Catastrophe Rate Online Index

Tracking CAT Losses Including:
- Severe Weather
- Floods
- Fires
- Winter Storms
- Mine Collapse
- Explosions
- Tornadoes
- Wildfires
- Hailstorms
- Satellite losses
- Airplane Crashes
- Train Crash/Explosions
- Hurricane
- Terrorist Attacks
- Typhoon
- Cyclone
- Windstorms
- Ice Storms

(Source: Guy Carpenter)
Reinsurance/Insurance Industry Analytics

Global Property Catastrophe Reinsurance Rate-on-Line Index

Inferring pricing cycles and stabilization from history

- Winter storm Daria + Typhoon Mirielle ($15 bn)
- Hurricane Andrew ($26 bn)
- Northridge ($22 bn)
- 9/11 ($24 bn)
- Katrina, Rita, Wilma ($99 billion)
- Ike ($22 billion)
- Credit crunch (at least $15 bn)
- Chile, Xynthia, Deepwater, etc ($30 billion)
- Superstorm Sandy ($20 bn)
- Tohoku, Christchurch, Thailand, etc (at least $120 billion)

Source: Guy Carpenter & Company, LLC

(all losses in 2012 USD)
Questions and Answers