# Natural Catastrophe Review Webinar
# First Half of 2015

July 14, 2015

Munich RE

# Agenda

**Introduction**
Sharon Cooper
Press Spokesperson, Munich Re America

**US Natural Catastrophe Update**
Carl Hedde
Head of Risk Accumulation, Munich Re America

**Update on El Niño & Global Natural Catastrophes**
Dr. Peter Höppe
Head of Geo Risks Research, Munich Re

**Economic Implications of Natural Catastrophe Losses**
Dr. Robert Hartwig
President & Economist, Insurance Information Institute

# Webinar Interactivity

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## Questions and Answers

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

An operator will facilitate your participation.

## Live Tweeting

@Munichre_US @lworters @iii

#NATCAT2015

# US Natural Catastrophes - First Half of 2015

Carl Hedde, Head of Risk Accumulation
Munich Reinsurance America, Inc.

Source: FEMA

# US Headlines – First Half 2015

- Insured losses in US totaled $8.2 billion – far below 2000 - 2014 average loss of $11.2 billion (Jan-June)
- Drought conditions in California continue to worsen, creating increased risk of wildfires. El Niño conditions may bring much needed rains this winter
- Record rainfall in Texas and Oklahoma alleviate drought, but cause severe flash flooding in Houston and Texas Hill Country
- Eastern U.S. experienced second winter of brutal cold/snow; damage estimated to exceed $2.9 billion, a new record (in terms of original loss dollars)
- Severe thunderstorm events caused estimated $5.1 billion in insured loss, lowest half-year total since 2006

# Natural disaster losses in the U.S. 2015

## Based on perils (January – June only)

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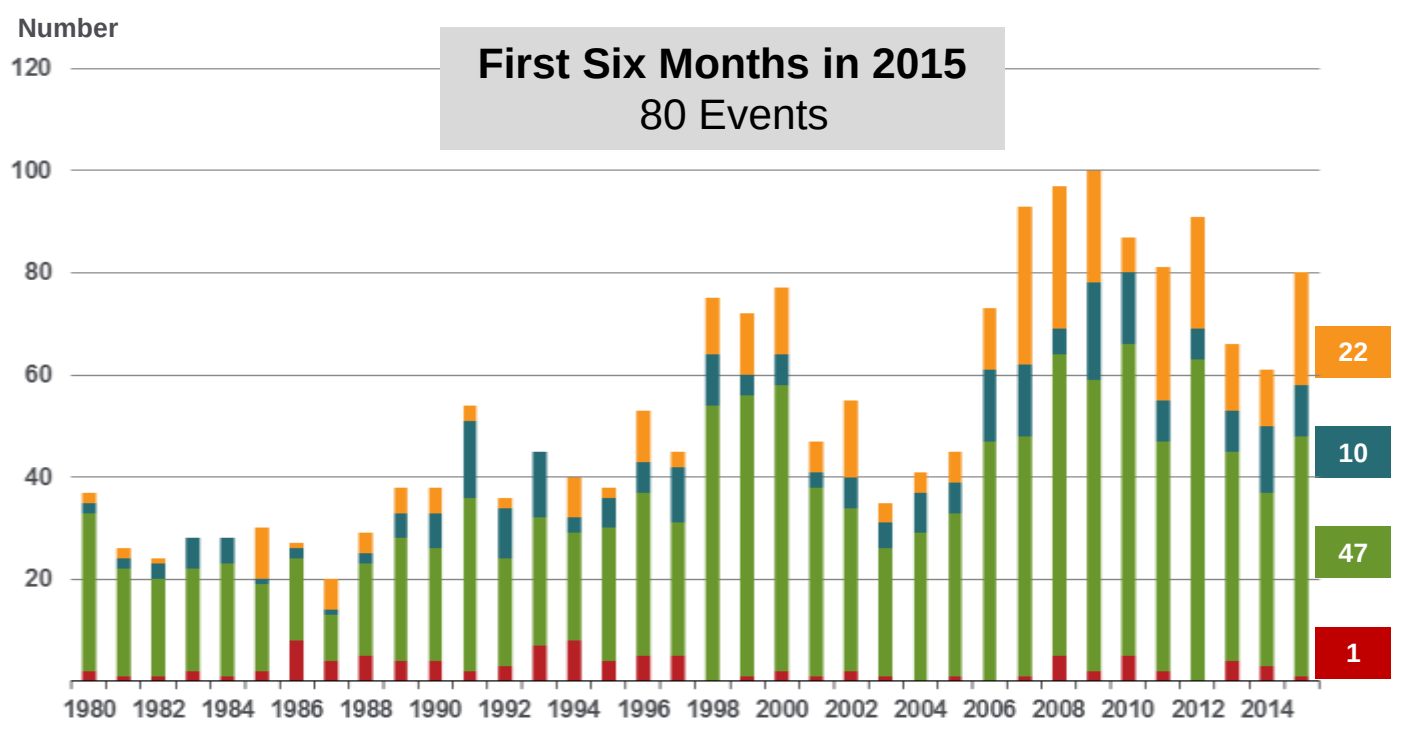
| As of July 1, 2015 | Number of Events | Fatalities | Estimated Overall Losses (US $m) | Estimated Insured Losses (US $m)* |
|---|---|---|---|---|
| Severe Thunderstorm | 38 | 66 | 7,000 | 5,100 |
| Winter Storms & Cold Waves | 11 | 80 | 3,800 | 2,900 |
| Flood, Flash Flood | 10 | 4 | 500 | 150 |
| Earthquake & Geophysical | 1 | - | - | - |
| Tropical Cyclone | 2 | 4 | 100 | 60 |
| Wildfire, Heat Waves, & Drought | 18 | - | 1,300 | Minor market loss |
| **Totals** | **80** | **154** | **12,600** | **8,200** |

*Source: Property Claim Services (PCS) as of 7.7.2015

# Loss events in the U.S. 1980 – 2015

## Number of events (January – June only)




**Geophysical events**
(Earthquake, tsunami, volcanic activity)

**Meteorological events**
(Tropical storm, extratropical storm, convective storm, local storm)

**Hydrological events**
(Flood, mass movement)

**Climatological events**
(Extreme temperature, drought, forest fire)

Source: Munich Re, NatCatSERVICE

# Loss events in the U.S. 1980 – 2015

## Overall and insured losses (January – June only)

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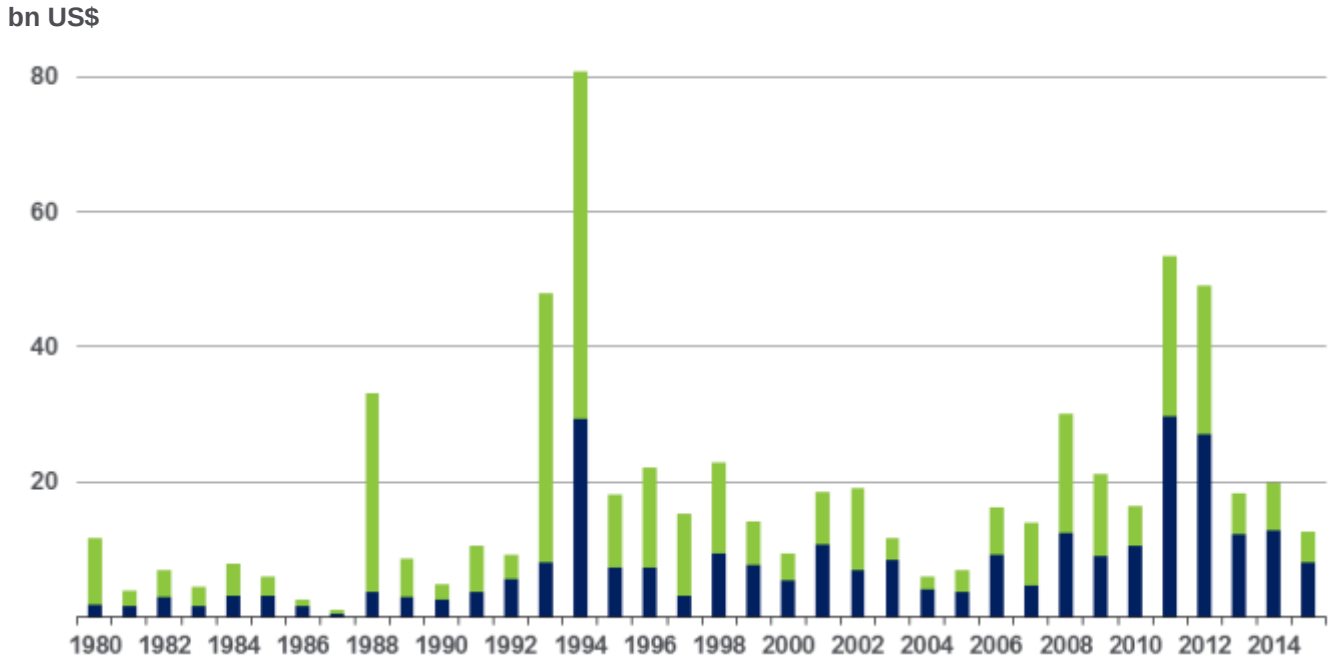
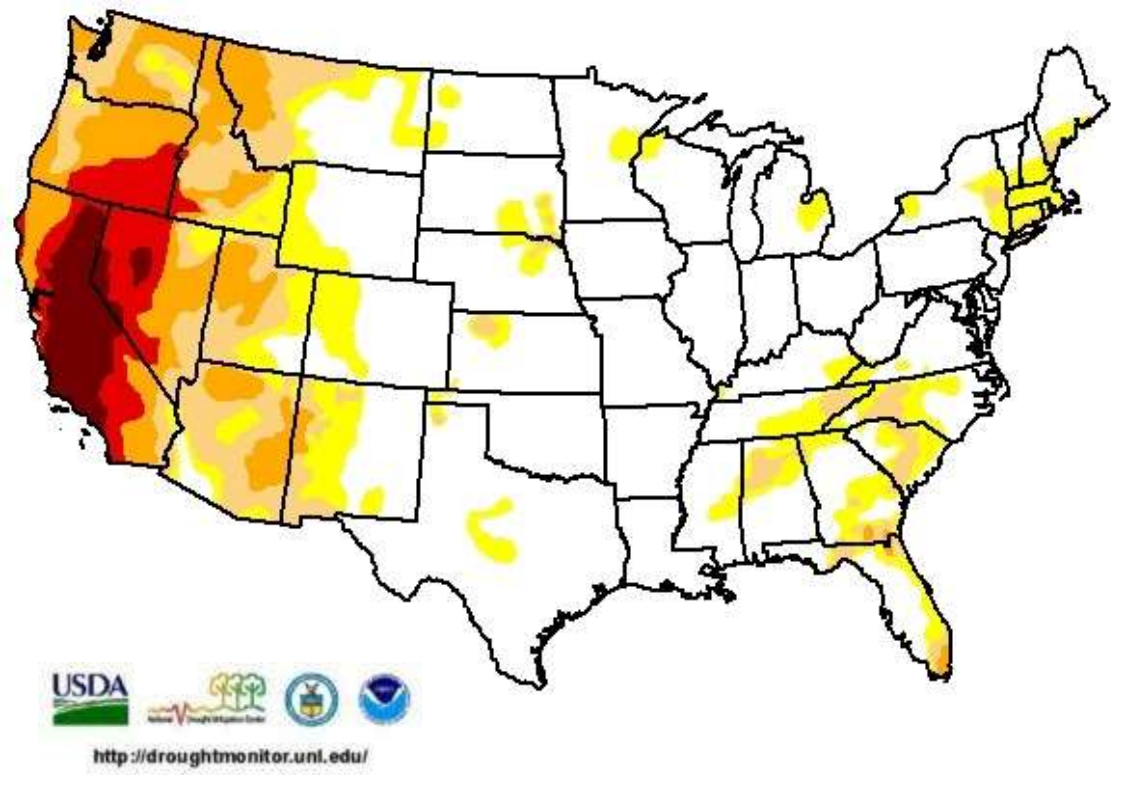
### Overall losses totaled US$ 12.6bn; Insured losses totaled US$ 8.2bn




Source: Munich Re, NatCatSERVICE


# Notable U.S. Events First Half of 2015

# Drought Conditions as of 30 June 2015




*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 61.47 | 38.53 | 25.88 | 15.54 | 6.76 | 2.86 |
| **Last Week** 6/23/2015 | 59.88 | 40.12 | 25.13 | 14.31 | 6.76 | 2.86 |
| **3 Months Ago** 3/31/2015 | 41.43 | 58.57 | 36.84 | 18.60 | 8.97 | 3.34 |
| **Start of Calendar Year** 12/30/2014 | 53.20 | 46.80 | 28.68 | 16.93 | 8.96 | 2.54 |
| **Start of Water Year** 9/30/2014 | 52.22 | 47.78 | 30.57 | 18.66 | 9.41 | 3.85 |
| **One Year Ago** 7/1/2014 | 55.57 | 44.43 | 34.01 | 25.00 | 11.98 | 2.98 |

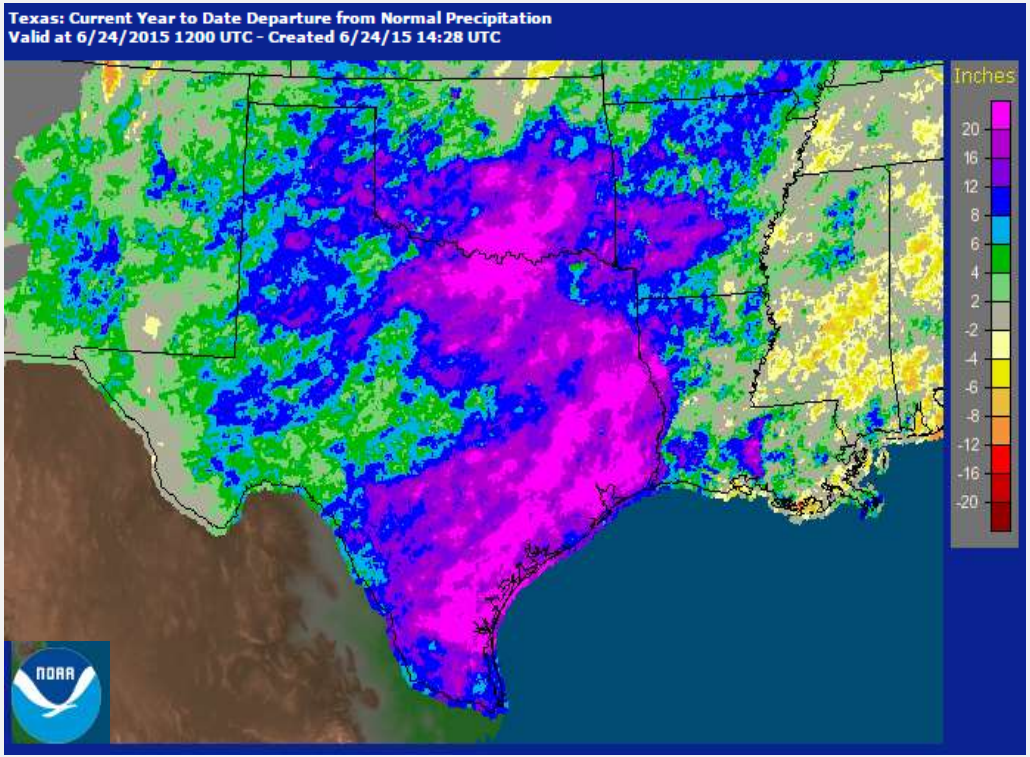
*Intensity:*

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

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

# Extreme Precipitation in Texas & Oklahoma

- The United States saw its wettest month of May on record.
- May 2015 was also the wettest month in the history of Oklahoma and Texas, in terms of statewide average rainfall.
- OK: 14.18” (Previous 10.75”, October 1941)
- TX: 7.54” (Previous 6.66”, June 2004)



# Winter storms

## First Half 2015

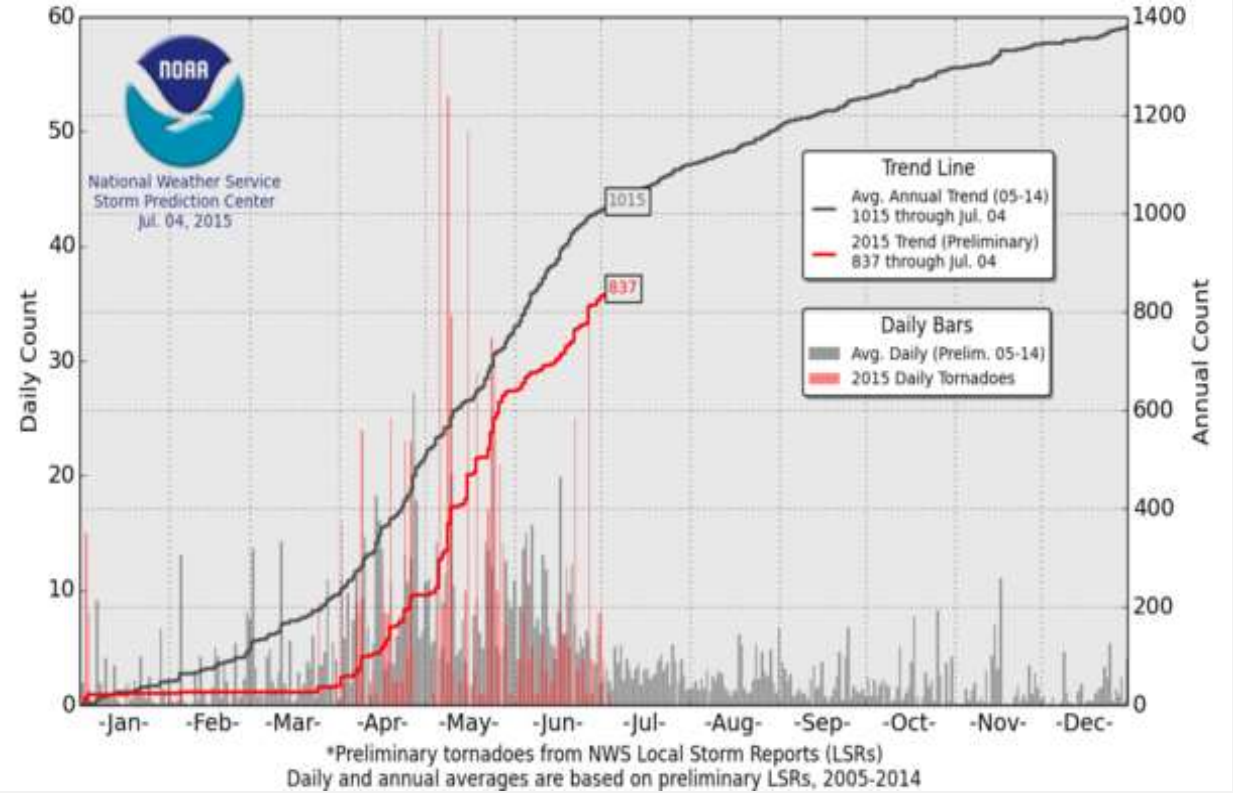
- For second straight year, persistent ridge over western North America caused frigid air to stream southward into eastern US
- Record snowfalls across New England, caused numerous roof collapses, while frigid temperatures burst pipes
- Aggregate insured losses estimated at $2.9 billion, largest total in terms of original loss dollars

Source: FEMA

Source: Property Claims Service; MR NatCatSERVICE

# Thunderstorms

## Tornado Count for First Half 2015




- Preliminary tornado counts for first half of 2015 about 200 below the 2005-2014 average.
- Tornado counts in April (185) and May 2015 (414) were much higher than in 2014.

Source: NOAA

# Insured Loses Due to Convective Storms*
## January – June Only, 1980 - 2015

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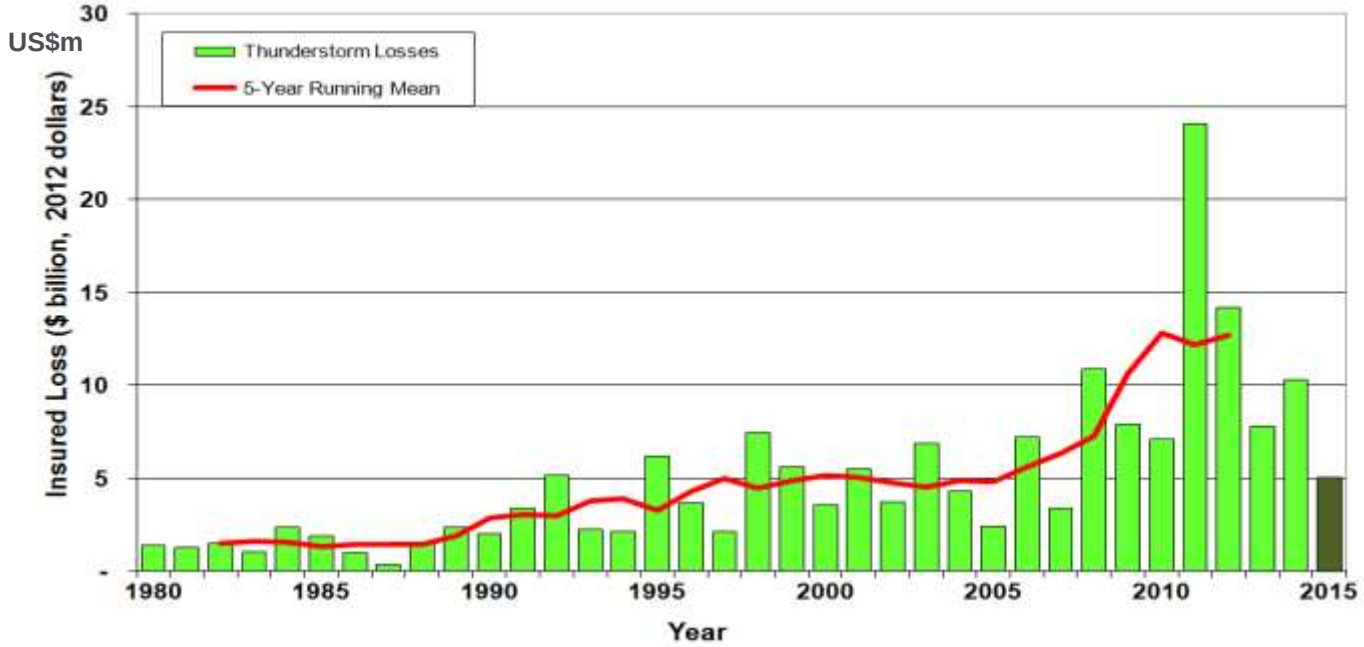
**Overall losses totaled US$ 7.0bn; Insured losses totaled US$ 5.1bn**




Insured losses (in 2014 values)**

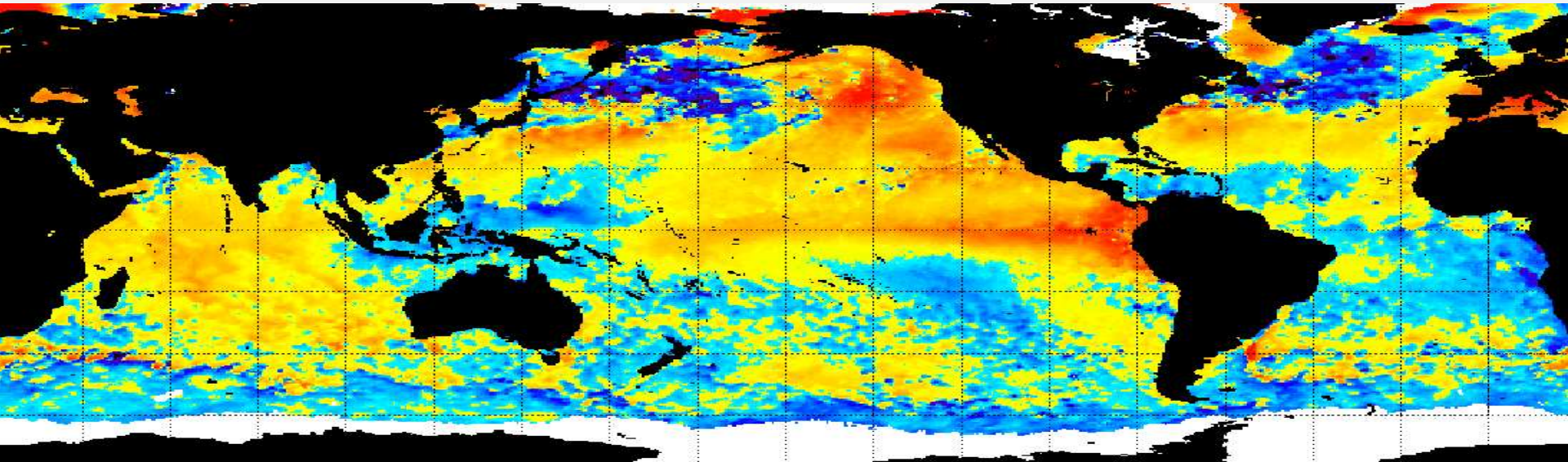
5 year Mean

*Convective storms include tornadoes, hail, and straight-line winds

**Losses adjusted to inflation based on country CPI

# Update on El Niño

Dr. Peter Höppe, Head of Geo Risks Research
Munich Re



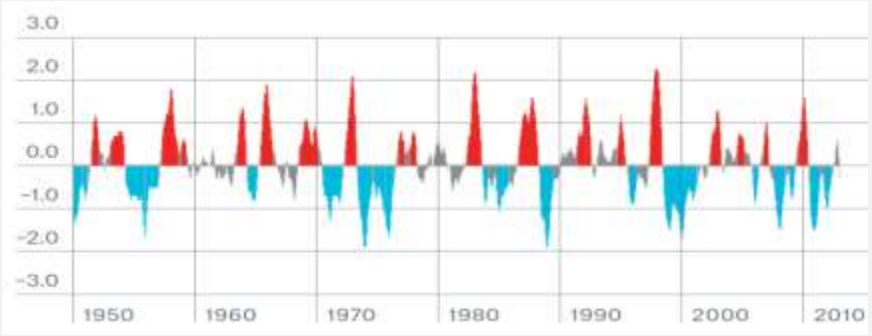
# ENSO (El Niño/Southern Oscillation)
## Definitions

- ENSO (El Niño/Southern Oscillation): natural climate oscillation in tropical Pacific Ocean, which affects both ocean and atmosphere.
- Anomaly of sea surface temperature in so called Niño3.4-Region (= Niño3.4-Index) is used to define ENSO-Phases:

- El Niño (Niño3.4-Index >0,5)
- Neutral Phase (Niño3.4-Index <0,5 und >-0,5)
- La Niña (Niñno3.4-Index <-0,5)

Location of Niño 3.4-region

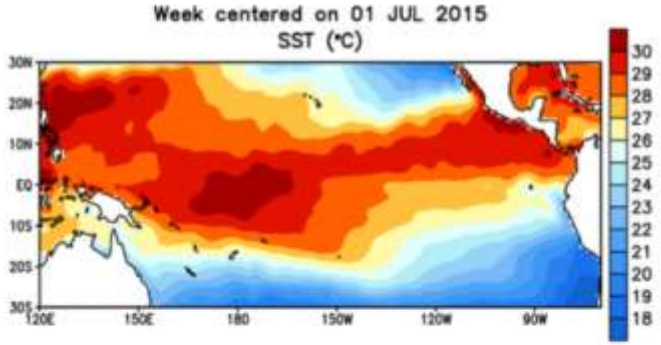

Anomalies of sea surface temperatures in Niño3.4-region since 1950

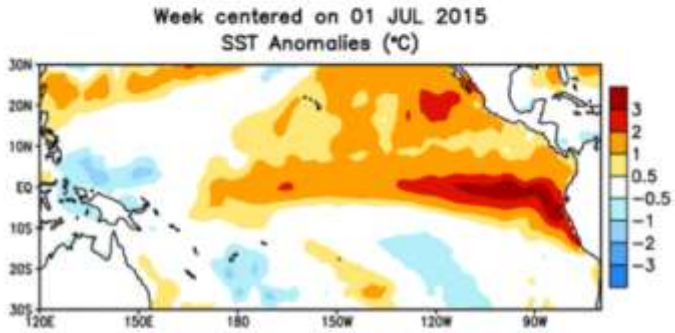



Source: Climate Prediction Center/NOAA

# The 2015-2016 El Niño

- Moderate El Niño conditions have developed over past 6 months over eastern equatorial Pacific
- Forecasts indicate this will likely be strongest El Niño event since 1997-1998
- If strong El Niño develops, there is high probability for a La Niña next year
- Current Impacts:
  - Record amount of Accumulated Cyclone Energy (ACE) released by northern hemisphere tropical cyclones so far this year (166 vs. normal of 54 through 30 June)
  - Disruption of monsoons in South Asia; has contributed to the record heat wave there.



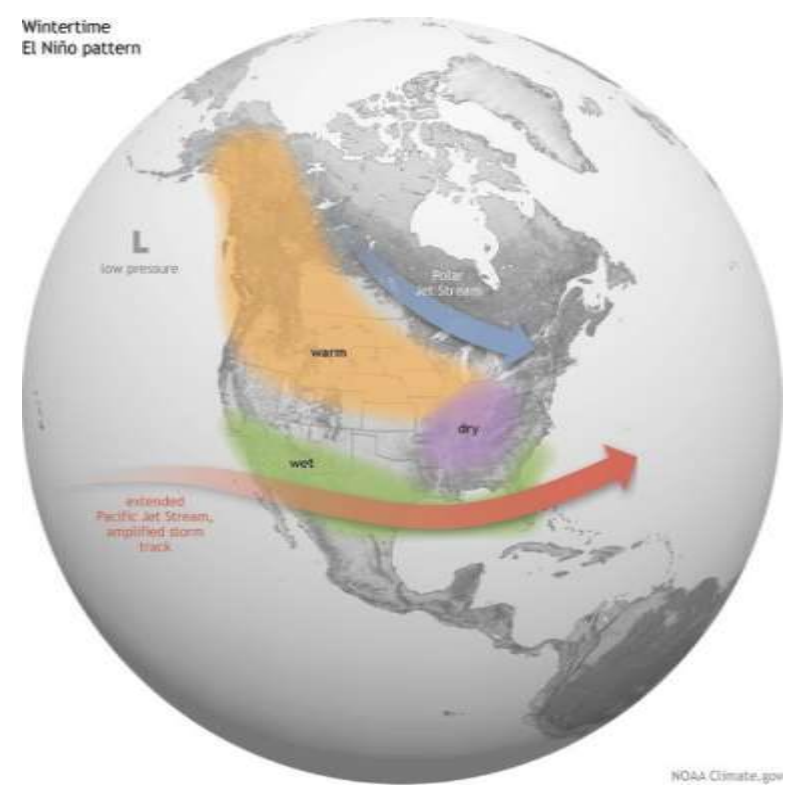




Source: NOAA/CPC

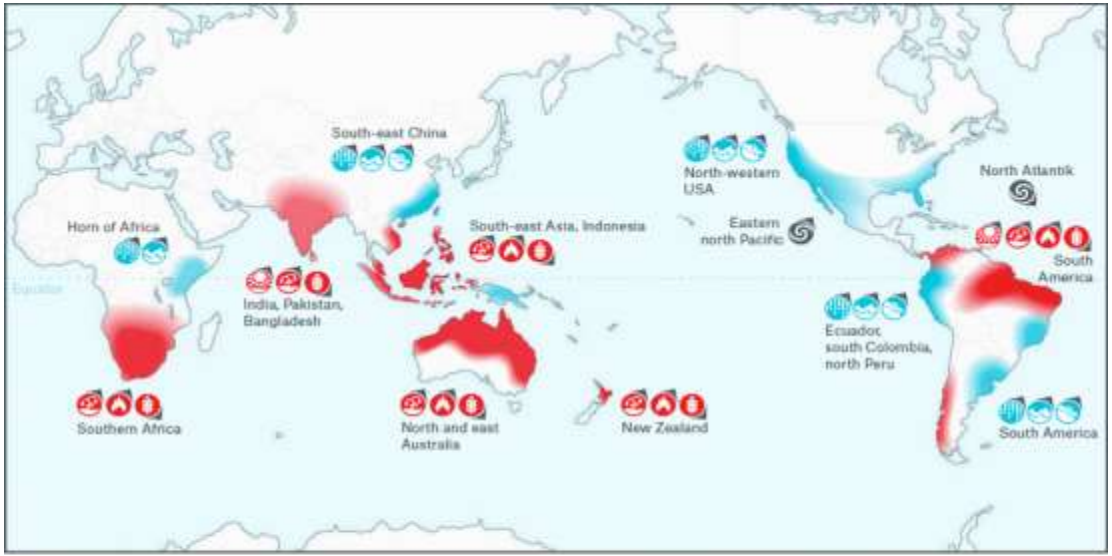
# The 2015-2016 El Niño

## Expected U.S. Impacts:

- Cooler and wetter than normal along southern third of nation
- Drier than normal in Pacific Northwest and Ohio River valley; warmer than normal from Alaska to Northern Plains
- Reduced tropical cyclone risk in Atlantic; increased risk in Eastern Pacific and Hawaii.
- Potential for heavy rains, mudslides in California
- Potential for reduced winter tornado outbreaks over south-central U.S. ; increased risk of winter tornadoes over Florida peninsula



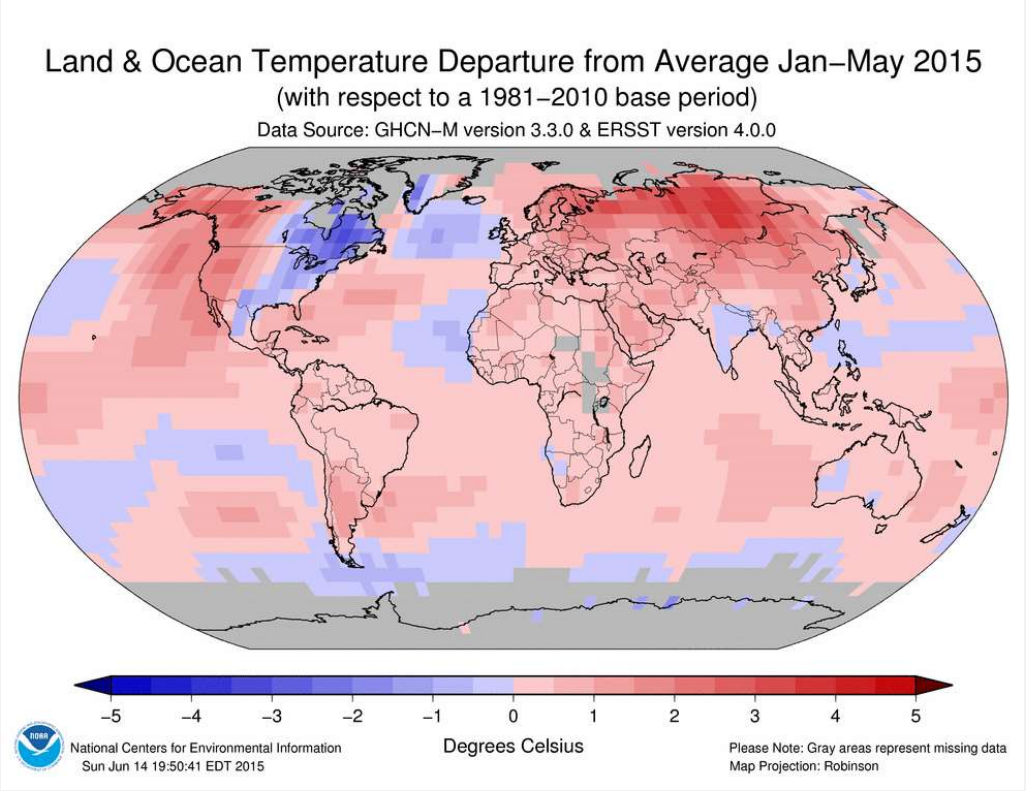
# Global characteristic changes in El Niño phases




- Lower TS activity in Atlantic ocean; higher in East-Pacific
- Increased flood risks in South America; Southeast China
- Increased drought risk in East and North Australia; Southeast and South Asia; Southern Africa; North/Northeast Brazil

# State of Climate (NOAA): 2014 warmest year on record! 2015 starts with new record!

- 2014 was the warmest year across global land and ocean surfaces since records began in 1880
- 9 of 10 warmest years in 135-year period of record have occurred in 21st century
- 1998 currently ranks as fourth warmest year on record.
- January to May 2015 warmest first five months on record!



# G7 Climate Risk Insurance Initiative

- G7 decided to support people in developing countries to protect themselves against economic consequences of more intense and frequent extreme weather events
- Target: extra 400 million people earning less than US$ 2 per day get access to direct (100 m) or indirect (300 m) insurance of losses caused by weather extremes
- German Government already pledged € 150 million for first two project years with option of more to follow later
- Munich Re has been involved w/German government in preparation of G7 initiative: directly with in house geo risks research expertise and indirectly by Munich Climate Insurance Initiative (MCII)
- CRII has high potential to become milestone on climate change adaptation and resilience for poor countries.

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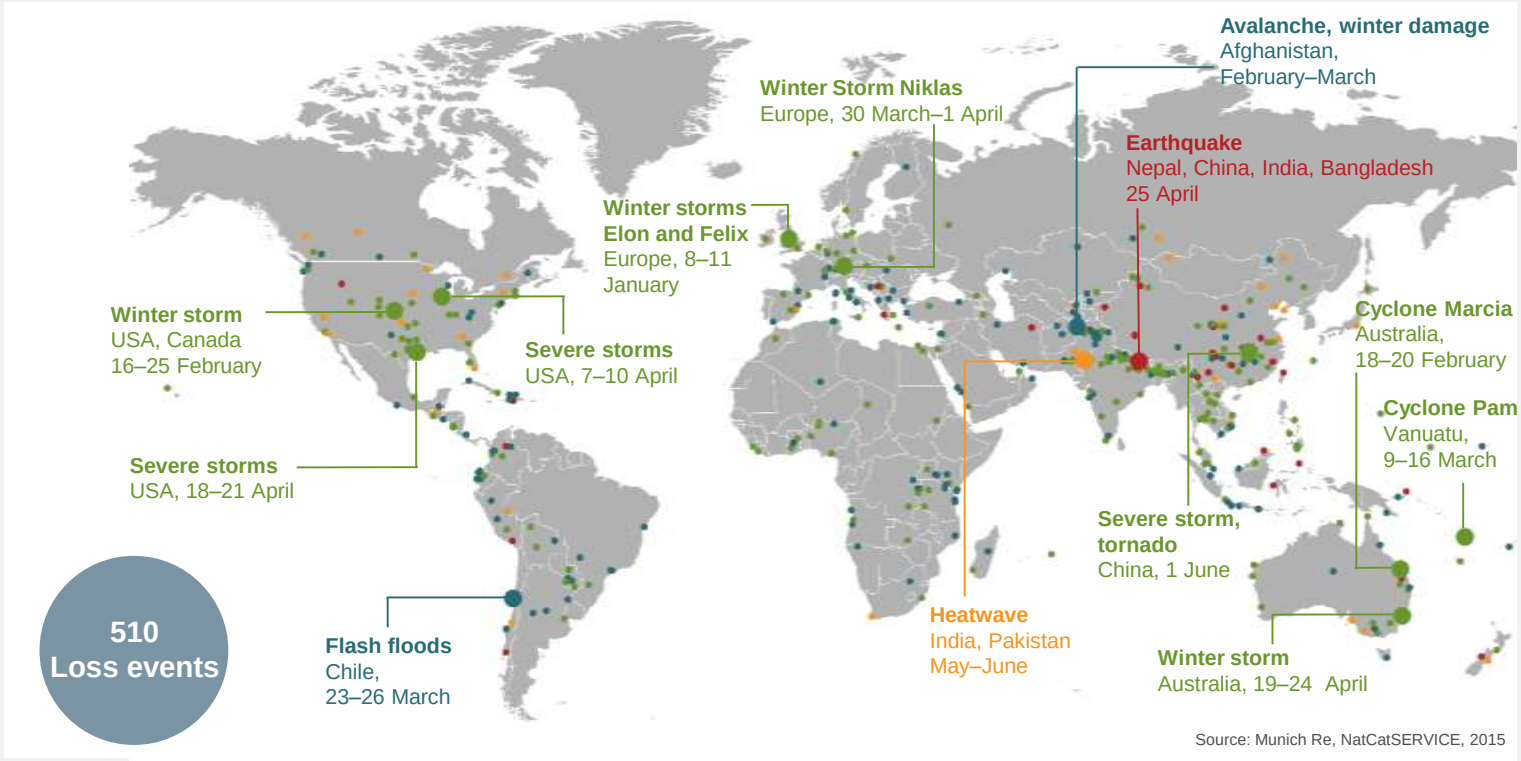
# Global Natural Catastrophes - First Half of 2015

# Loss events worldwide Jan – June 2015
## Geographical overview



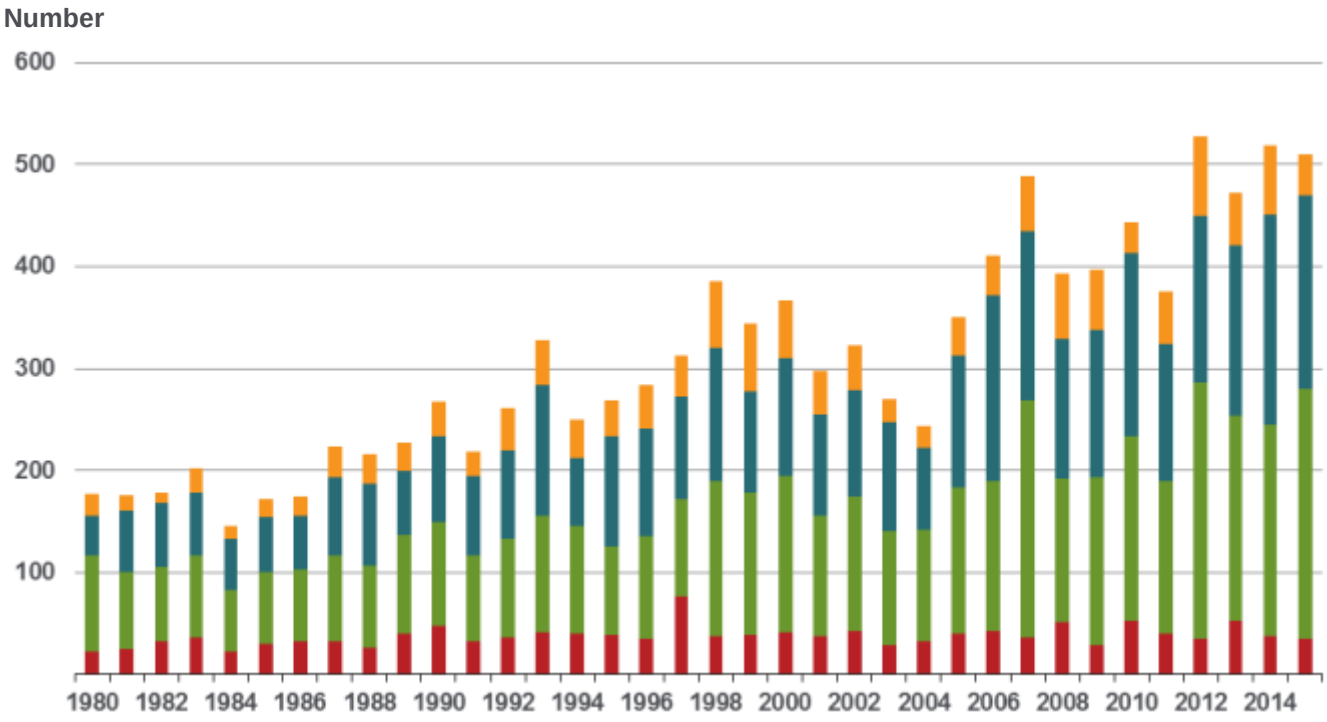

- **Geophysical events** (Earthquake, tsunami, volcanic activity)
- **Meteorological events** (Tropical storm, extratropical storm, convective storm, local storm)
- **Hydrological events** (Flood, mass movement)
- **Climatological events** (Extreme temperature, drought, wildfire)

- **Loss events**
- **Selection of Catastrophes**

Source: Geo Risks Research, NatCatSERVICE – As at July 2015

# Loss events worldwide 1980 – 2015

## Number of events (January – June only)

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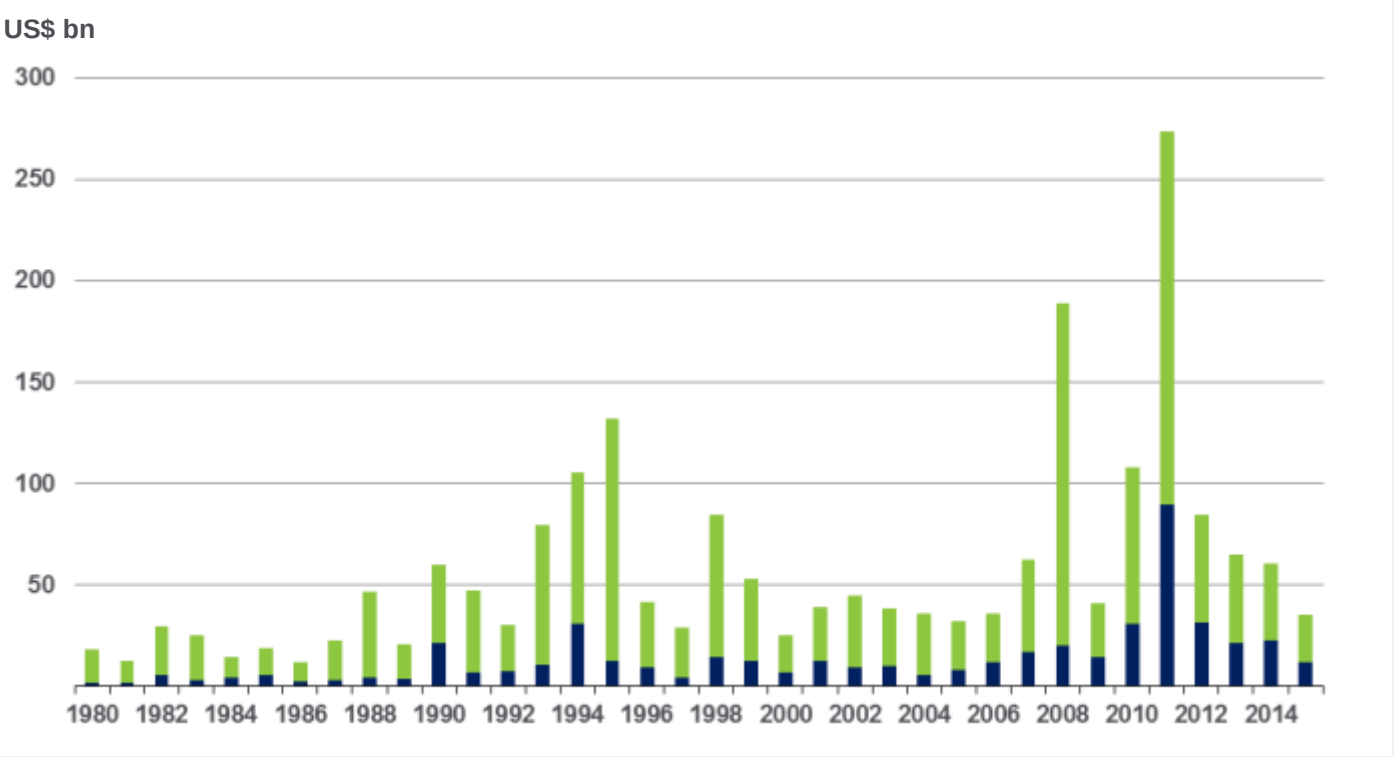
# Loss events worldwide 1980 – 2015

## Overall and insured losses (January – June only)




Source: Munich Re, NatCatSERVICE – As at July 2015

# Loss events worldwide 2015

## Overview and comparison with previous years

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| | 2015 (Jan – June) | 2014 (Jan – June) | Average of the last 10 years 2005-2014 (Jan – June) | Average of the last 30 years 1985-2014 (Jan – June) | Top Year 1985 -2014 (Jan – June) |
|---|---|---|---|---|---|
| Number of events | 510 | 520 | 440 | 330 | 620 **(2012)** |
| Overall losses in US$ m (original values) | 35,000 | 60,000 | 95,000 | 64,000 | 302,000 **(2011, EQ Japan)** |
| Insured losses in US$ m (original values) | 12,000 | 23,000 | 27,000 | 15,000 | 82,000 **(2011, EQ Japan)** |
| Fatalities | 16,200 | 2,800 | 46,000 | 27,000 | 230,000 **(2010, EQ Haiti)** |

# Loss events worldwide 2015

## The five costliest natural catastrophes for the insurance industry

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| Date | Region | Event | Fatalities | Overall losses US$ m | Insured losses US$ m |
|---|---|---|---|---|---|
| 16-25.2.2015 | United States, Canada | Winter storm | 39 | 2,400 | 1,800* |
| 30.3-1.4.2015 | Europe | Winter Storm Niklas | 11 | 1,400 | 1,000 |
| 7-10.4.2015 | United States | Severe storms | 3 | 1,400 | 990* |
| 18-21.4.2015 | United States | Severe storms | - | 1,100 | 780* |
| 23-28.5.2015 | United States | Severe storms | 32 | 1,300 | 750* |

*Date based on information from PCS

# Costliest natural catastrophes since 1980

## Ranked by insured losses

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| Year | Event | Region | Insured loss US$m (in original values) |
|---|---|---|---|
| 2005 | Hurricane Katrina | USA | 60,500 |
| 2011 | EQ, tsunami | Japan | 40,000 |
| 2012 | Hurricane Sandy | USA, Caribbean | 29,500 |
| 2008 | Hurricane Ike | USA, Caribbean | 18,500 |
| 1992 | Hurricane Andrew | USA | 17,000 |
| 2011 | EQ Christchurch | New Zealand | 16,500 |
| 2011 | Floods | Thailand | 16,000 |
| 1994 | EQ Northridge | USA | 15,300 |
| 2005 | Hurricane Wilma | USA, Caribbean | 12,500 |
| 2012 | Drought | USA | 12,000 |

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# Market & Financial Impact of Catastrophe Losses:
## *First Half 2015 Summary*

**Insurance Information Institute**
**July 14, 2015**

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

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# WINTER STORM LOSSES: *Significant Economic Impact—Again!*

## Losses from Snow, Ice, Freezing and Related Causes Typical Cost Insurers Between $1 Billion and $2 Billion Annually *($2.3B+ in 2014/15)*

# US Real GDP Growth*

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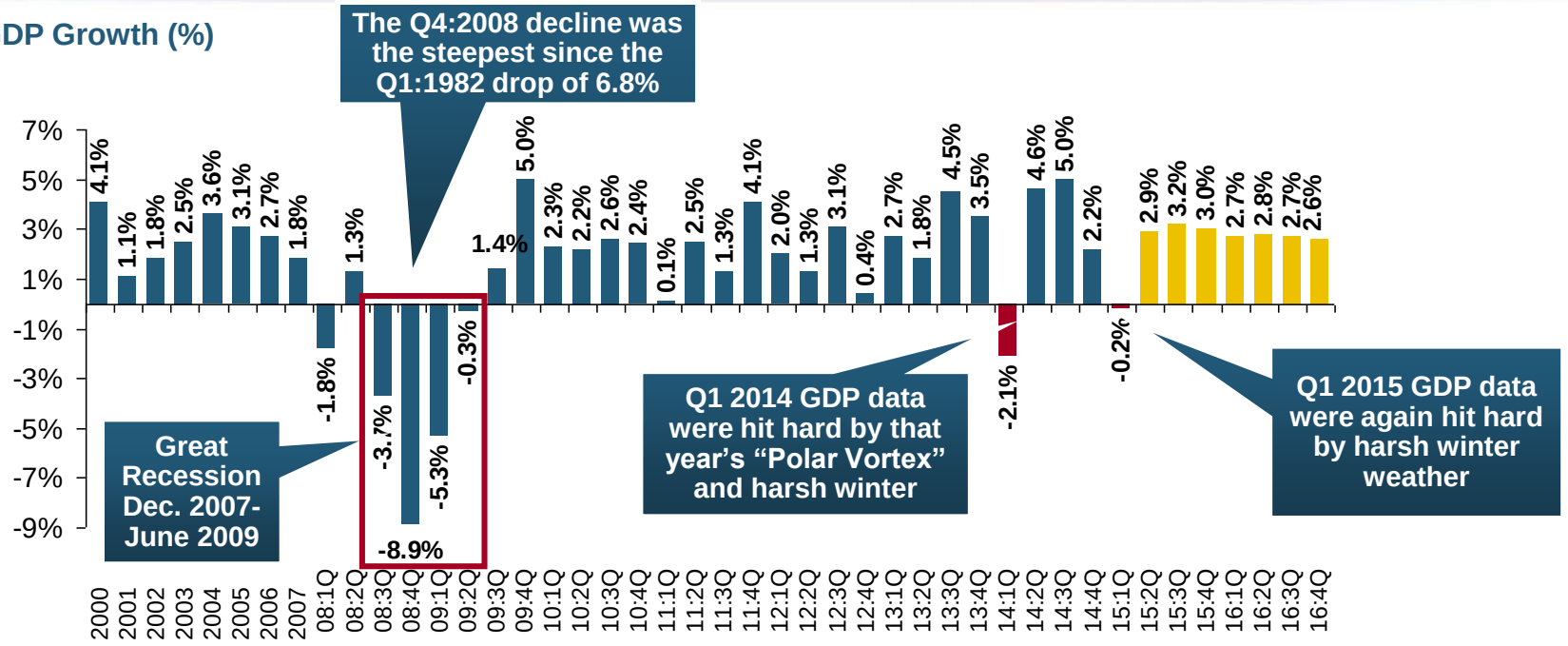
## Real GDP Growth (%)

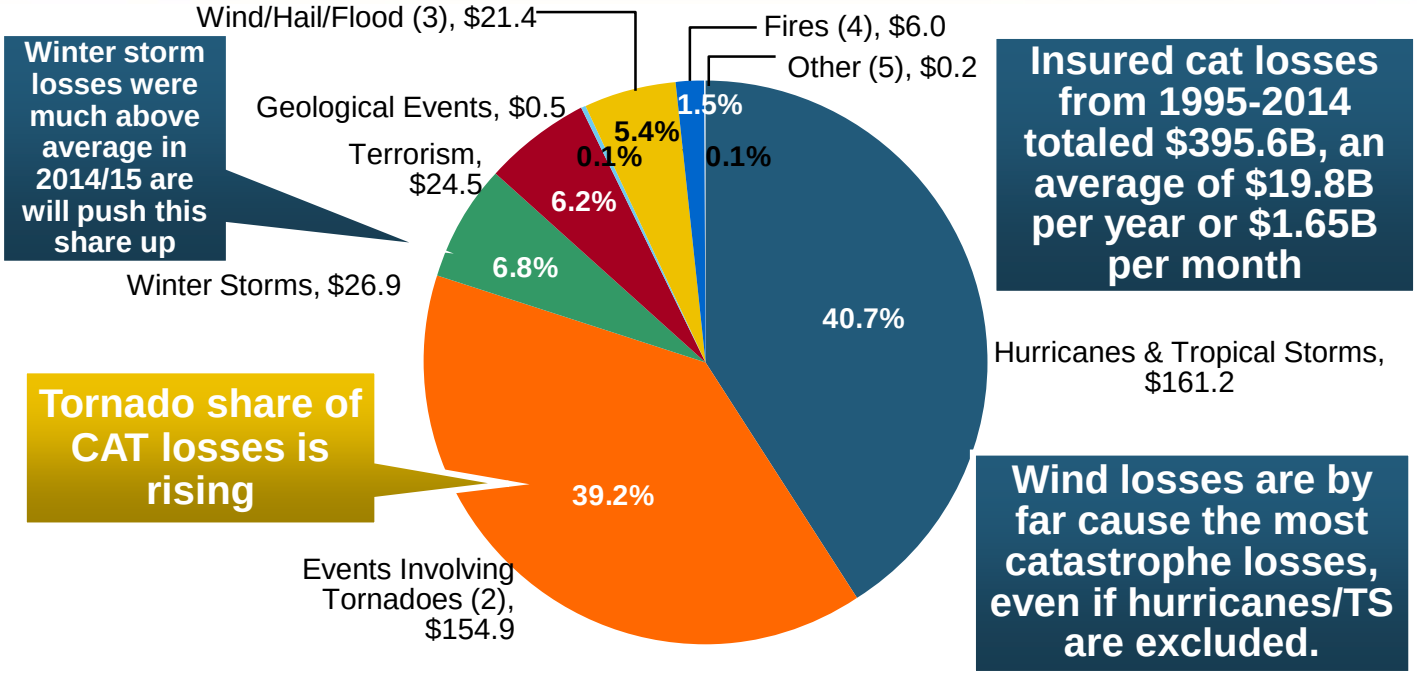



**Demand for Insurance Should Increase in 2015 as GDP Growth Accelerates Modestly and Gradually Benefits the Economy Broadly**

* Estimates/Forecasts from Blue Chip Economic Indicators.

Source: US Department of Commerce, Blue Economic Indicators 7/15; Insurance Information Institute.

# Inflation Adjusted U.S. Catastrophe Losses by Cause of Loss, 1995–2014[1]




1. Catastrophes are defined as events causing direct insured losses to property of $25 million or more in 2014 dollars.
2. Excludes snow.
3. Does not include NFIP flood losses
4. Includes wildland fires
5. Includes civil disorders, water damage, utility disruptions and non-property losses such as those covered by workers compensation.

Source: ISO's Property Claim Services Unit.

# Top 16 Most Costly Disasters in U.S. History—Katrina Still Ranks #1

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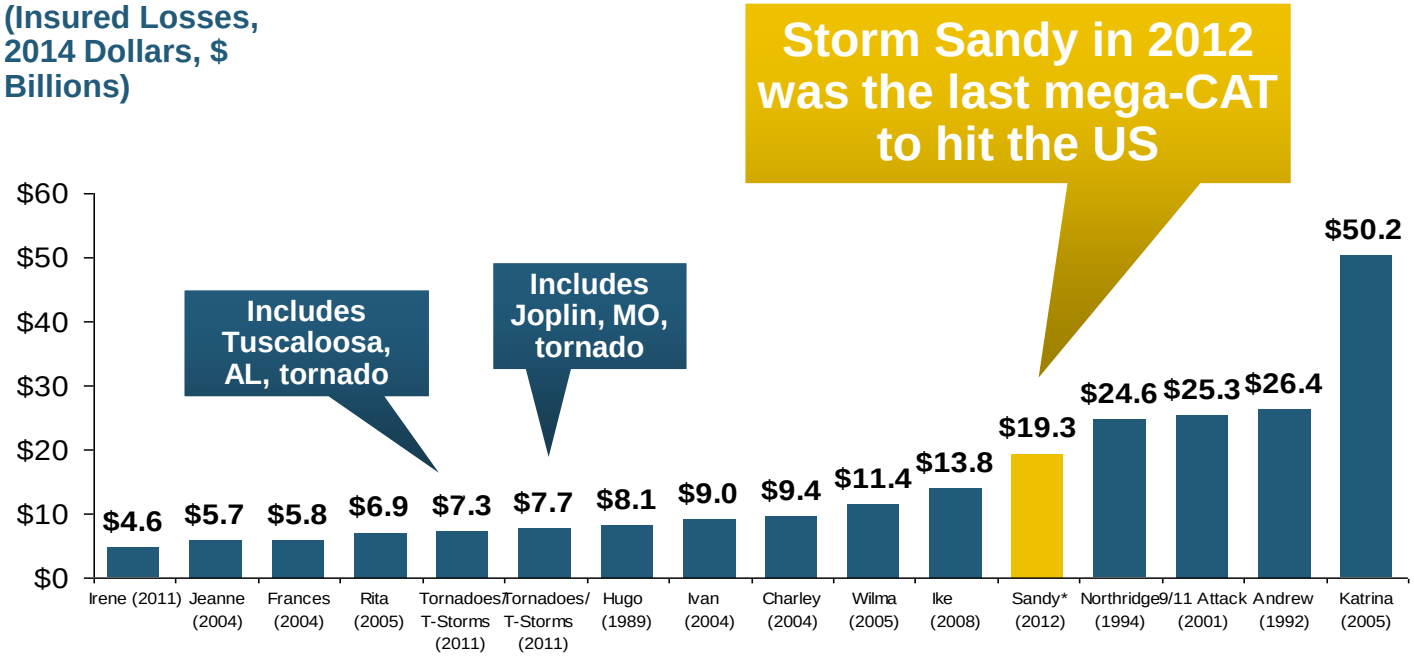
(Insured Losses, 2014 Dollars, $ Billions)




12 of the 16 Most Expensive Events in US History Have Occurred Since 2004

Sources: PCS; Insurance Information Institute inflation adjustments to 2014 dollars using the CPI.

# I.I.I. Poll: 10 Years After Katrina, Most Understand Flood Is Not Covered Under Standard HO Policies

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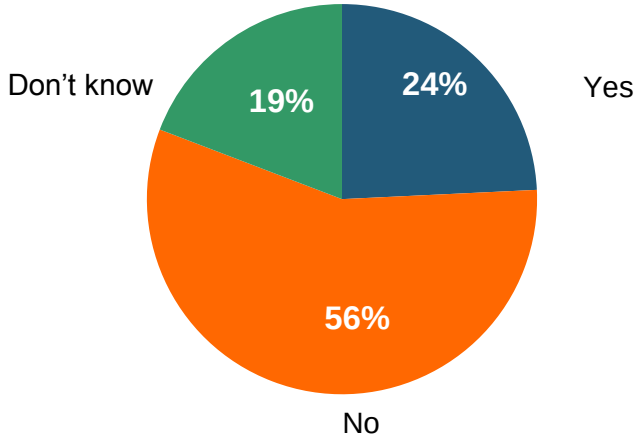
**Q. Does your homeowners policy cover damage from flooding during a hurricane?[1]**




**More Than Half of Homeowners Know Their HO Insurance Does Not Cover Flood From a Hurricane, But A Significant Proportion Either Think It Does Or Do Not Know.**

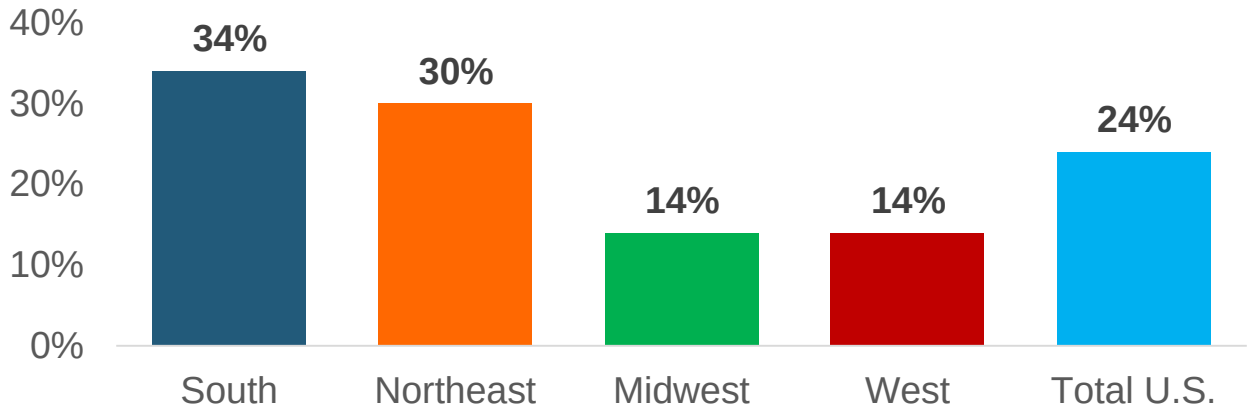
[1]Asked of those who have home insurance.

Source: Insurance Information Institute Annual *Pulse* Survey.

# I.I.I. Poll: Flooding from Hurricanes

**Q. Does your homeowners policy cover damage from flooding during a hurricane?[1]**

**Respondents answering "yes".**




**Homeowners in the South and Northeast Were Most Likely to Think Home Insurance Pays for Flood Damage.**

[1]Asked of those who have home insurance.

Source: Insurance Information Institute Annual *Pulse* Survey.

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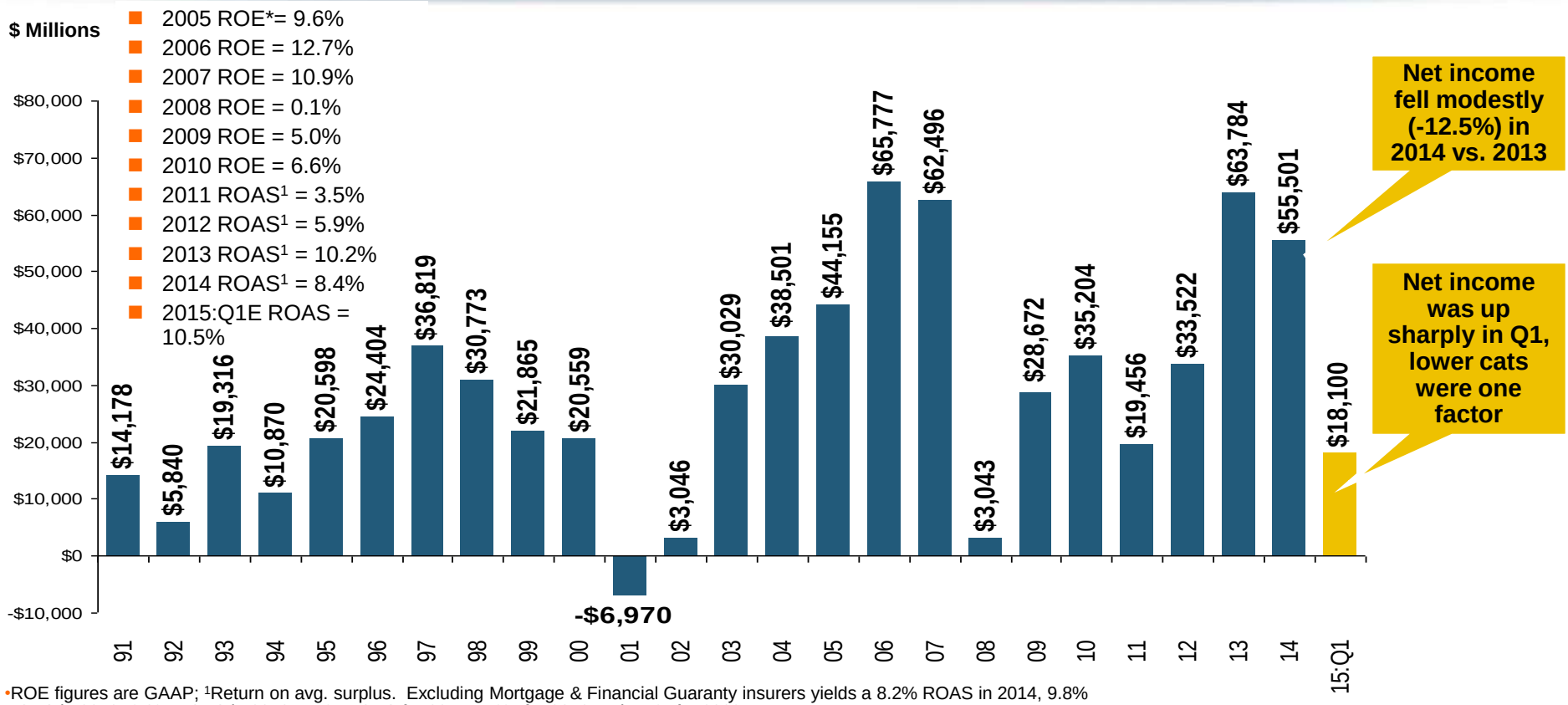
# P/C Insurance Industry: *Financial Update*

## 2015 Is Likely to Be One of the Strongest Years in the Post-Recession Era

## (2013 Was Best)

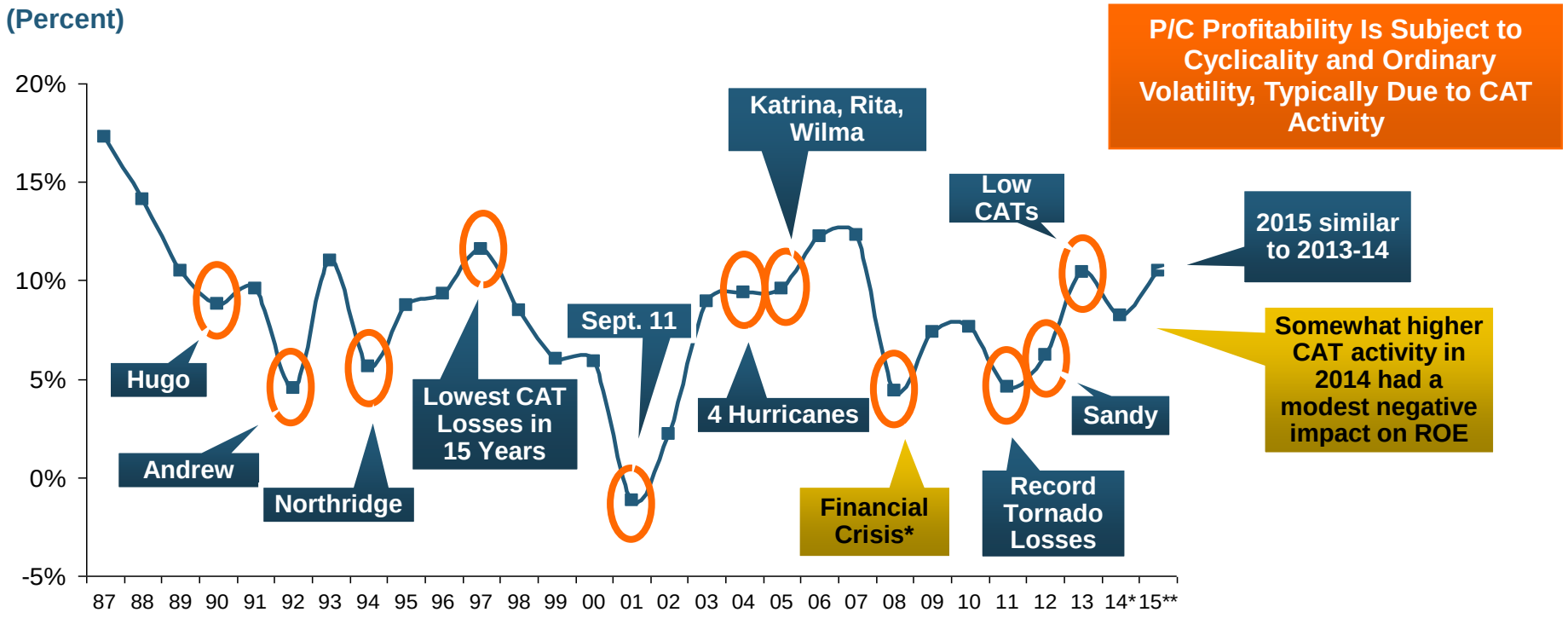
# P/C Industry Net Income After Taxes 1991–2015:Q1




•ROE figures are GAAP; [1]Return on avg. surplus. Excluding Mortgage & Financial Guaranty insurers yields a 8.2% ROAS in 2014, 9.8% ROAS in 2013, 6.2% ROAS in 2012, 4.7% ROAS for 2011, 7.6% for 2010 and 7.4% for 2009.

Sources: A.M. Best, ISO; Insurance Information Institute

# ROE: Property/Casualty Insurance by Major Event, 1987–2015:Q1




* Excludes Mortgage & Financial Guarantee in 2008 – 2014.
Sources: ISO; Insurance Information Institute.

# A 100 Combined Ratio Isn't What It Once Was: Investment Impact on ROEs

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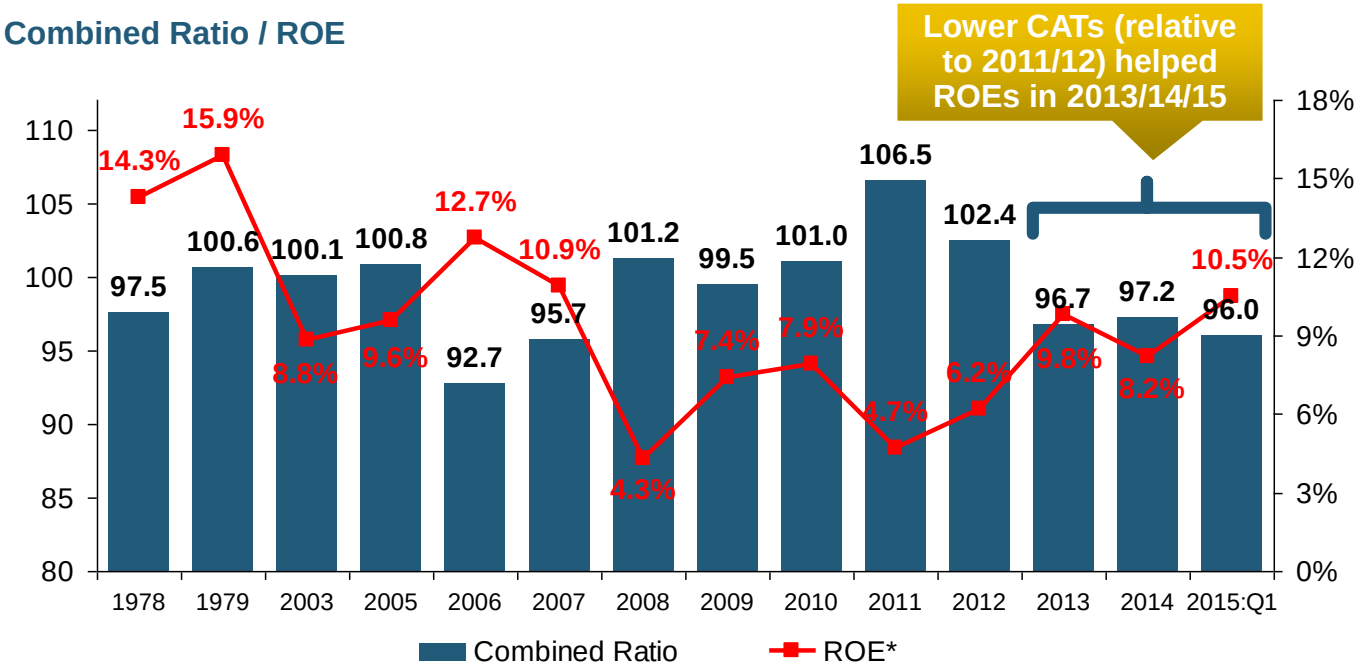


**A combined ratio of about 100 generates an ROE of ~7.0% in 2012/13, ~7.5% ROE in 2009/10, 10% in 2005 and 16% in 1979**

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

* 2008 -2014 figures are return on average surplus and exclude mortgage and financial guaranty insurers. 2014: combined ratio including M&FG insurers is 97.0; 2013 = 96.1; 2012 =103.2, 2011 = 108.1, ROAS = 3.5%.

Source: Insurance Information Institute from A.M. Best and ISO Verisk Analytics data.

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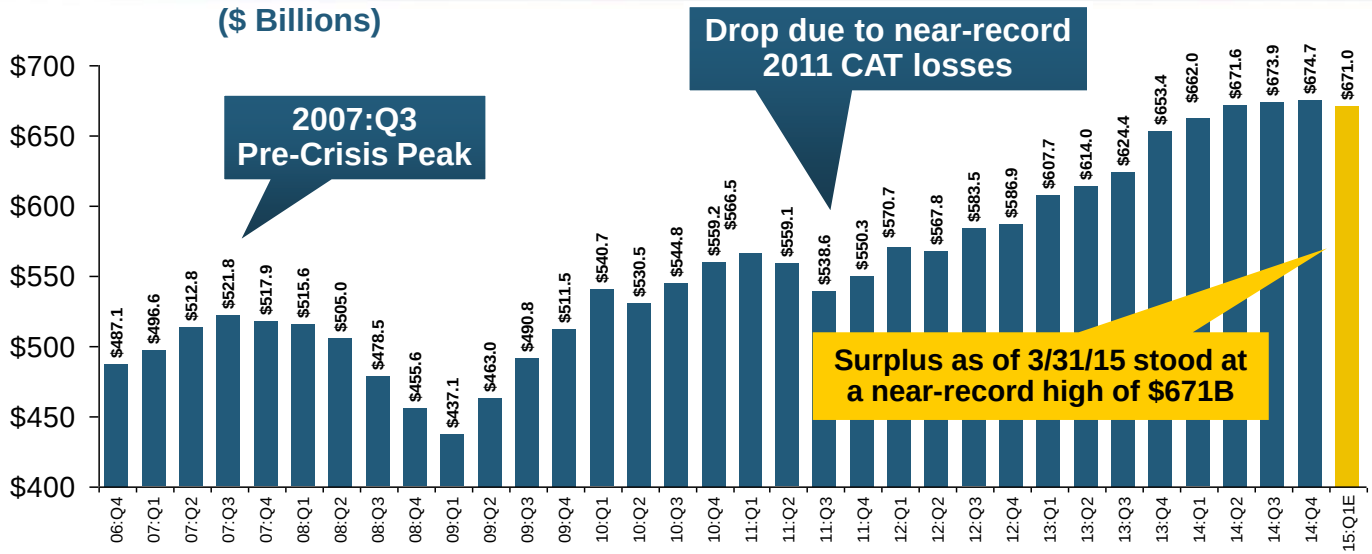
# SURPLUS/CAPITAL/CAPACITY

## Industry Claims Paying Capital Stands at Near Record High as of mid-2015

***(Re)Insurance Industry is Well Positioned to Manage Large Scale Catastrophe Losses***

# Policyholder Surplus, 2006:Q4–2015:Q1E




**The P/C insurance industry entered 2015 (and the 2015 hurricane season on June 1) in very strong financial condition.**

**The industry now has $1 of surplus for every $0.73 of NPW, close to the strongest claims-paying status in its history.**

2010:Q1 data includes $22.5B of paid-in capital from a holding company parent for one insurer's investment in a non-insurance business.

Sources: ISO, A.M .Best;
I.I.I. estimate for Q1:2015

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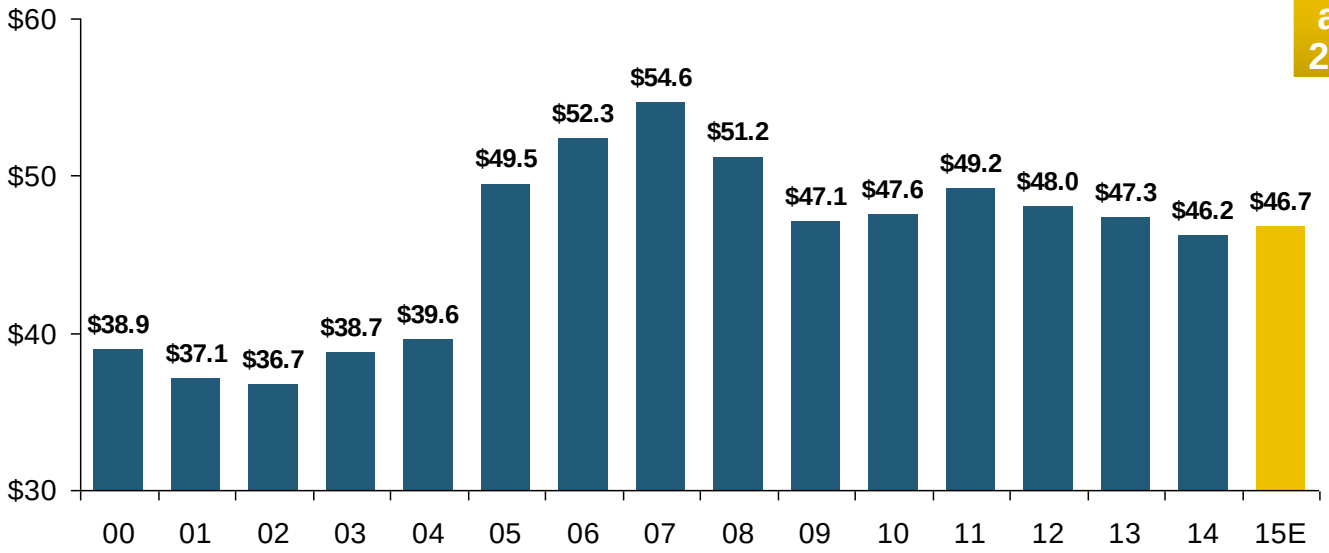
# Investments: The New Reality

## Investment Income Offsets Less Loss than in the Past, Including Losses from Catastrophes

# Property/Casualty Insurance Industry Investment Income: 2000–2015E[1]

($ Billions)



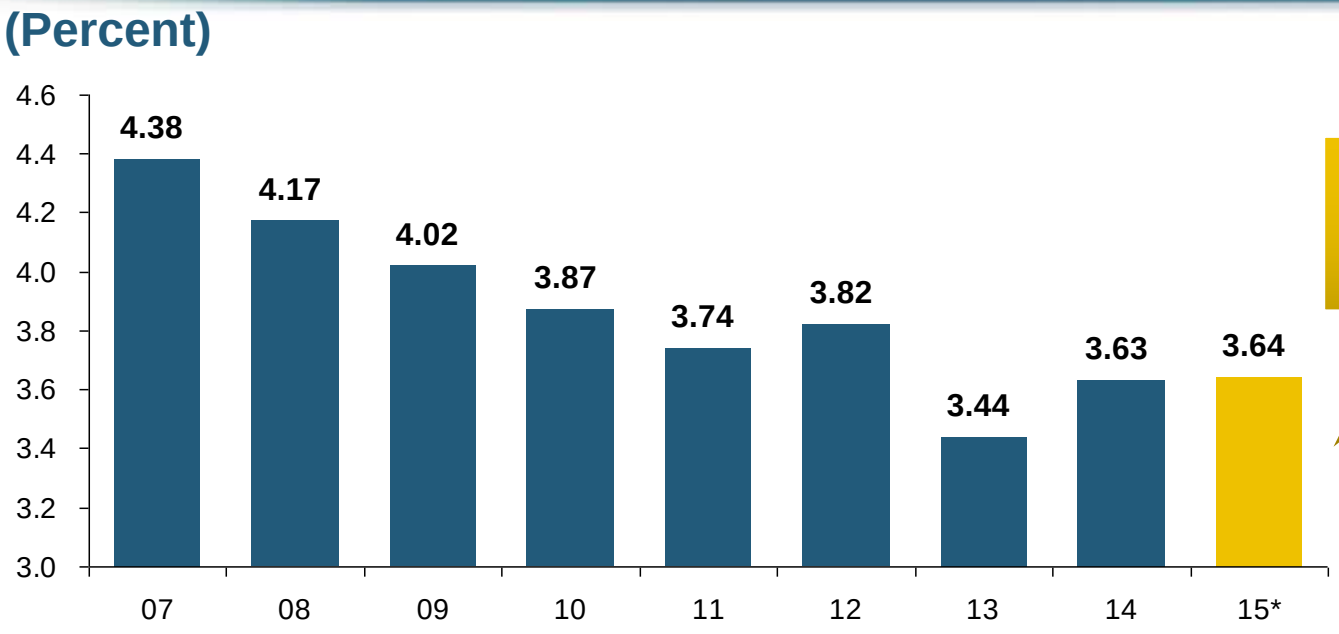

Investment earnings are still below their 2007 pre-crisis peak

**Due to persistently low interest rates, investment income fell in 2012, 2013 and 2014. A small increase in 2015 is possible as interest rates slowly increase.**

[1] Investment gains consist primarily of interest and stock dividends.
Sources: ISO; Insurance Information Institute.

*2015 figure is estimated based on annualized data through Q1.

# Book Yield on Property/Casualty Insurance Invested Assets, 2007–2015*




Book yield in 2015 is down 74 BP from pre-crisis levels

**The yield on invested assets remains low relative to pre-crisis yields. The Fed's plan to raise interest rates in late 2015 has already pushed up some yields, albeit quite modestly.**

*2015 figure is the average of the four quarters ending in 2015:Q1.
Sources: SNL Financial; Insurance Information Institute

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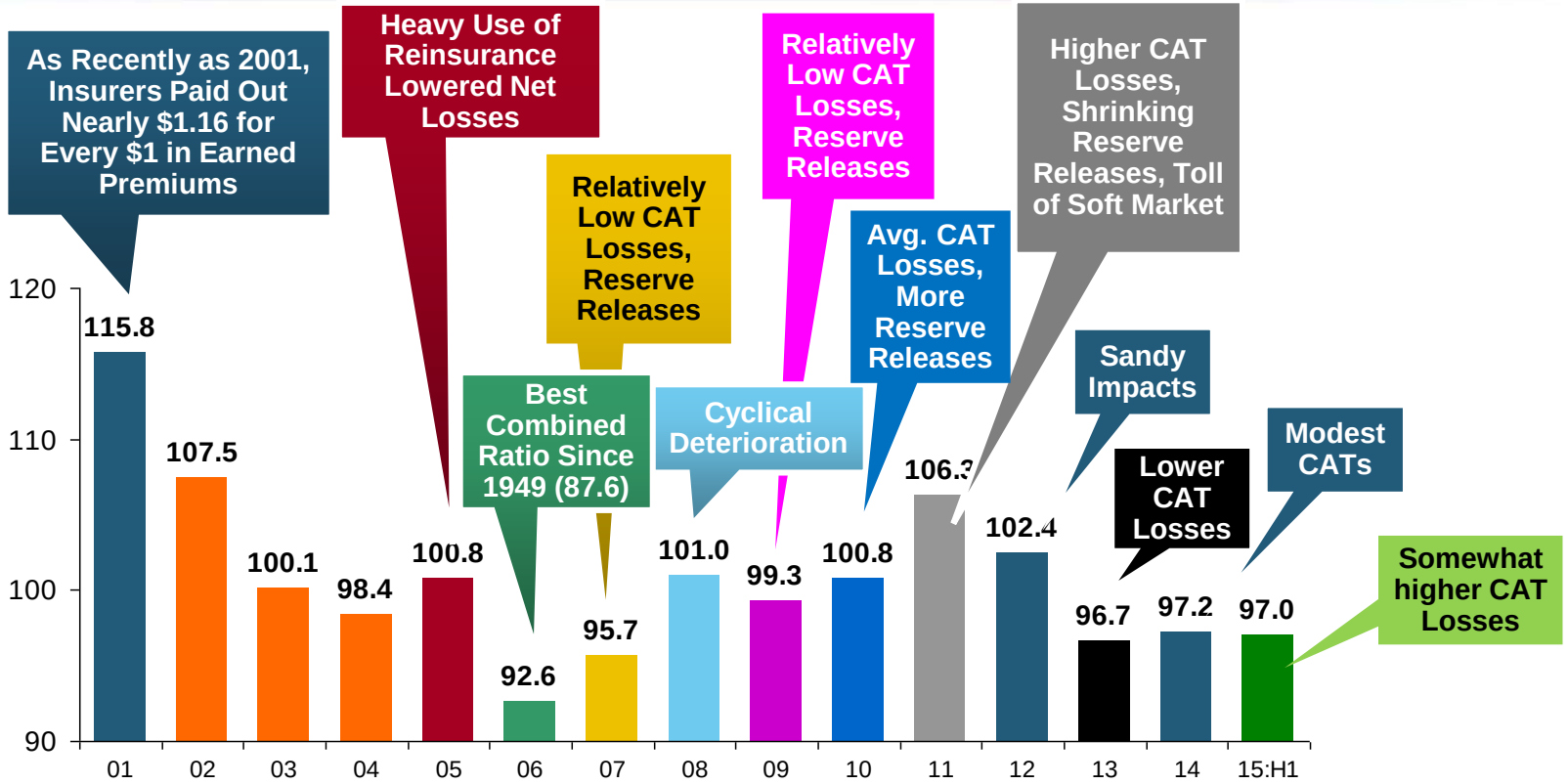
# UNDERWRITING

## Underwriting Results in 2015 (and 2013-14) Were Helped by Generally Modest Catastrophe Losses

***Welcome Respites from 2011/2012***

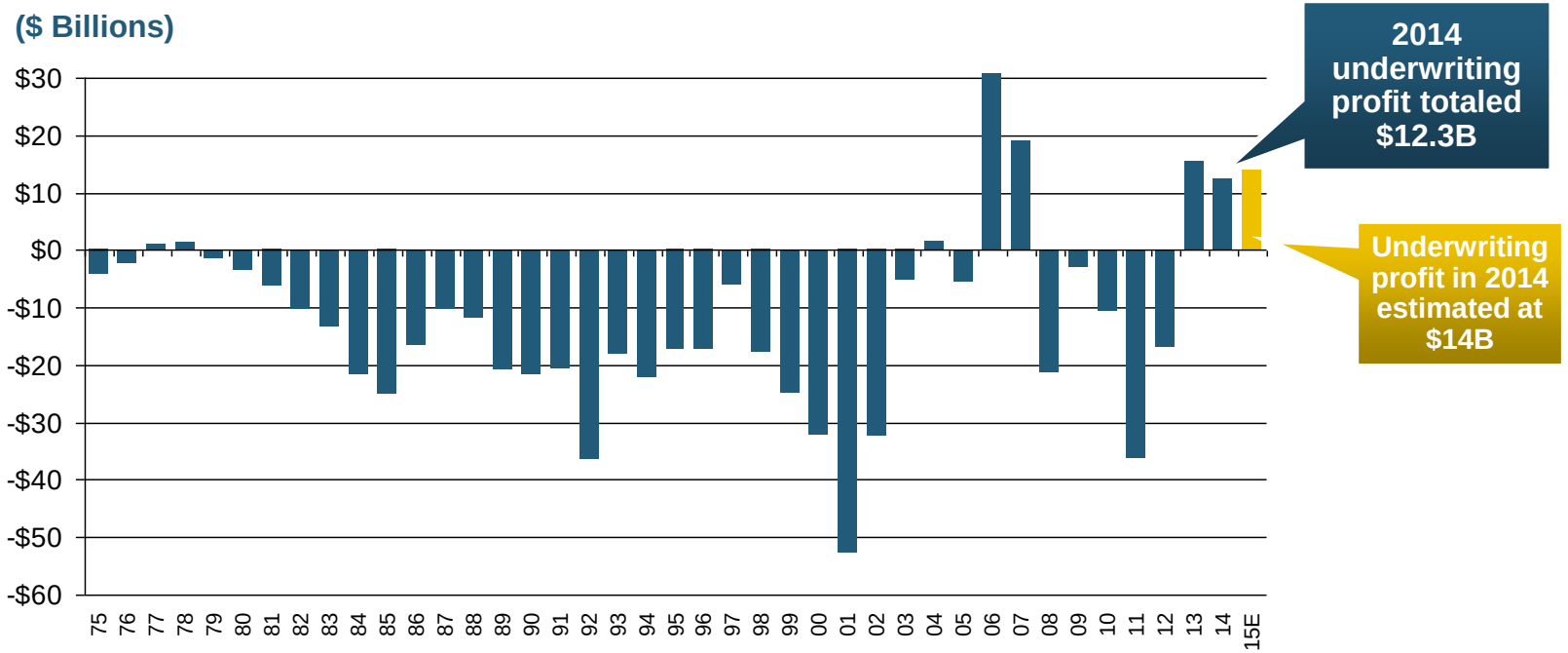
# P/C Insurance Industry Combined Ratio, 2001–2015:H1*




* Excludes Mortgage & Financial Guaranty insurers 2008--2014. Including M&FG, 2008=105.1, 2009=100.7, 2010=102.4, 2011=108.1; 2012:=103.2; 2013: = 96.1; 2014: = 97.0.

Sources: A.M. Best, ISO; I.I.I. estimate for H1:2015.

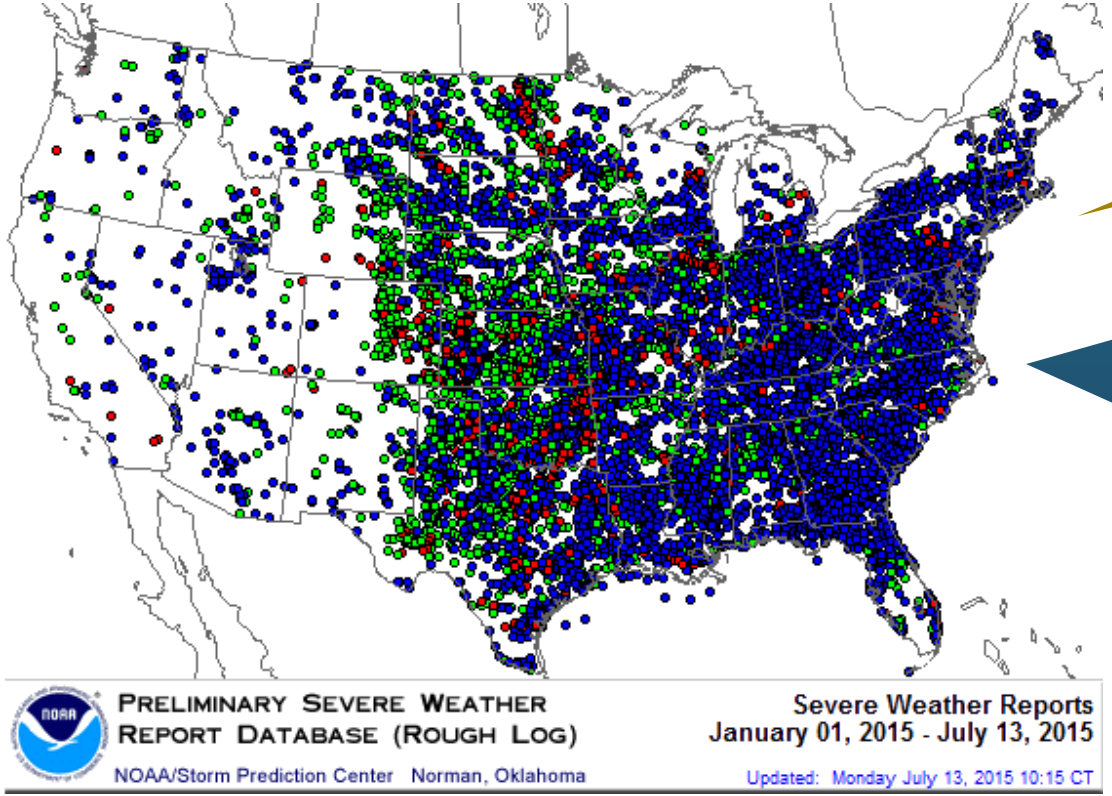
# Underwriting Gain (Loss)
# All Lines Combined, 1975–2015*




**High CAT losses in 2011 led to the highest underwriting loss since 2001. Lower CAT losses in 2013, 2014 and modest losses so far in 2015. First underwriting profits since 2007.**

Note: Includes mortgage and financial guaranty insurers in all years.
Sources: A.M. Best, ISO, Insurance Information Institute.

# Severe Weather Reports: Jan. 1 – July 13, 2015

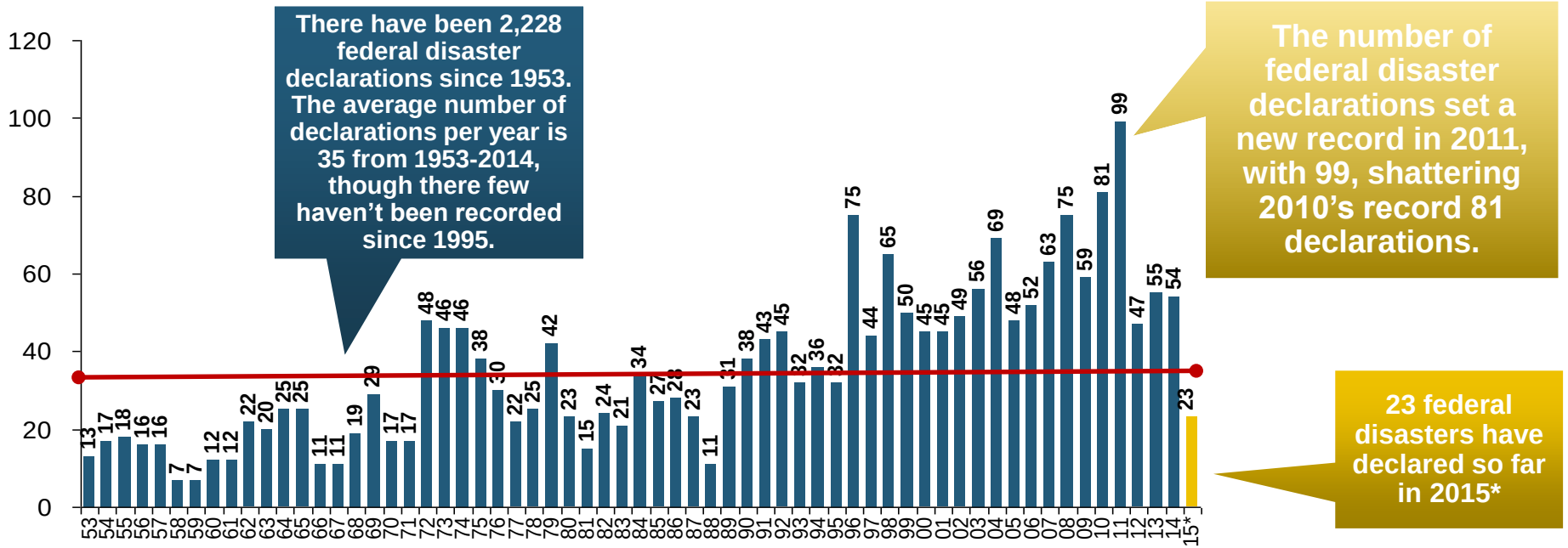



**Severe weather reports are concentrated east of the Rockies**

**weather reports through July 13, 2015; including 874 tornadoes; 3,921 "Large Hail" reports and 7,564**

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2015_annual_summary.html

# Number of Federal Major Disaster Declarations, 1953-2015*

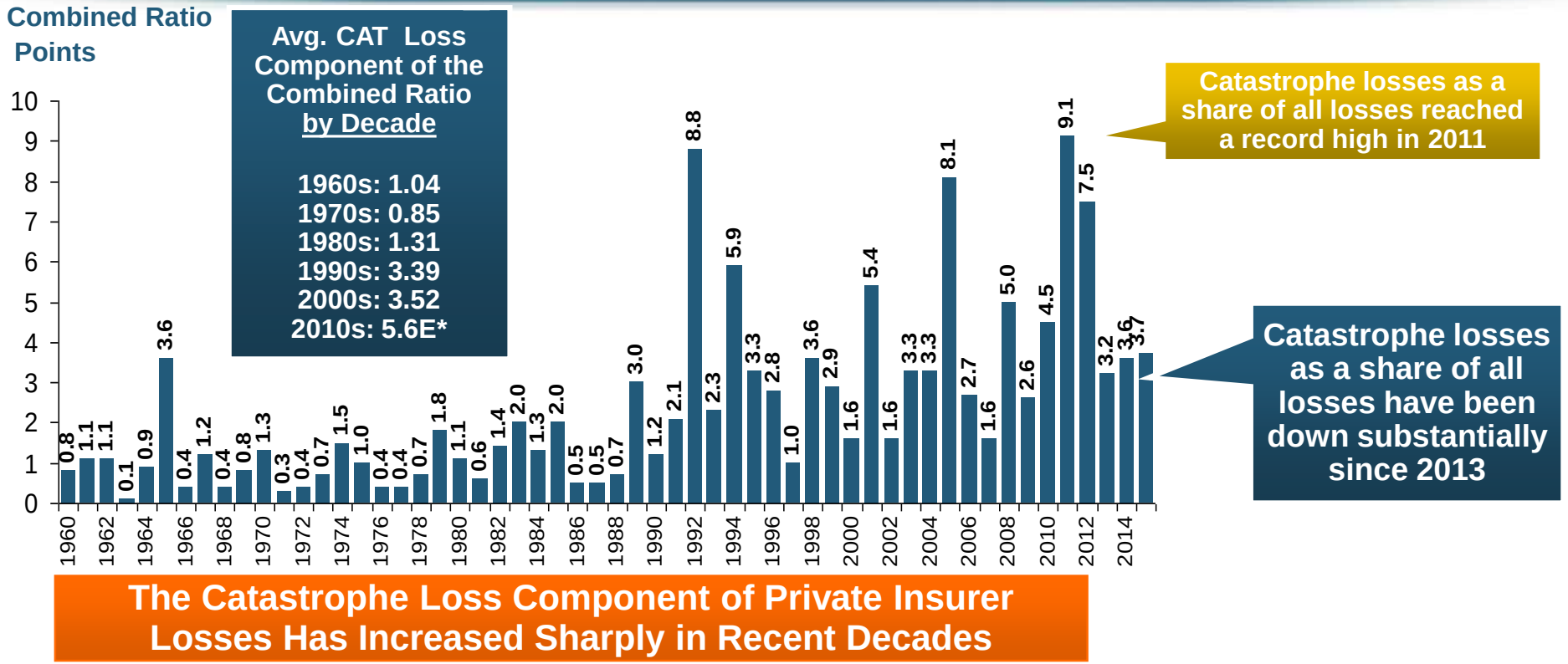



**The Number of Federal Disaster Declarations Is Rising and Set New Records in 2010 *and* 2011 Before Dropping in 2012-2014**

*Through July 12, 2015.

Source: Federal Emergency Management Administration; http://www.fema.gov/disasters; Insurance Information Institute.

# Combined Ratio Points Associated with Catastrophe Losses: 1960 – 2015E*




**The Catastrophe Loss Component of Private Insurer Losses Has Increased Sharply in Recent Decades**

*2010s represent 2010-2015E.

Notes: Private carrier losses only. Excludes loss adjustment expenses and reinsurance reinstatement premiums. Figures are adjusted for losses ultimately paid by foreign insurers and reinsurers.

Source: ISO (1960-2011); A.M. Best (2012-2014); Insurance Information Institute.

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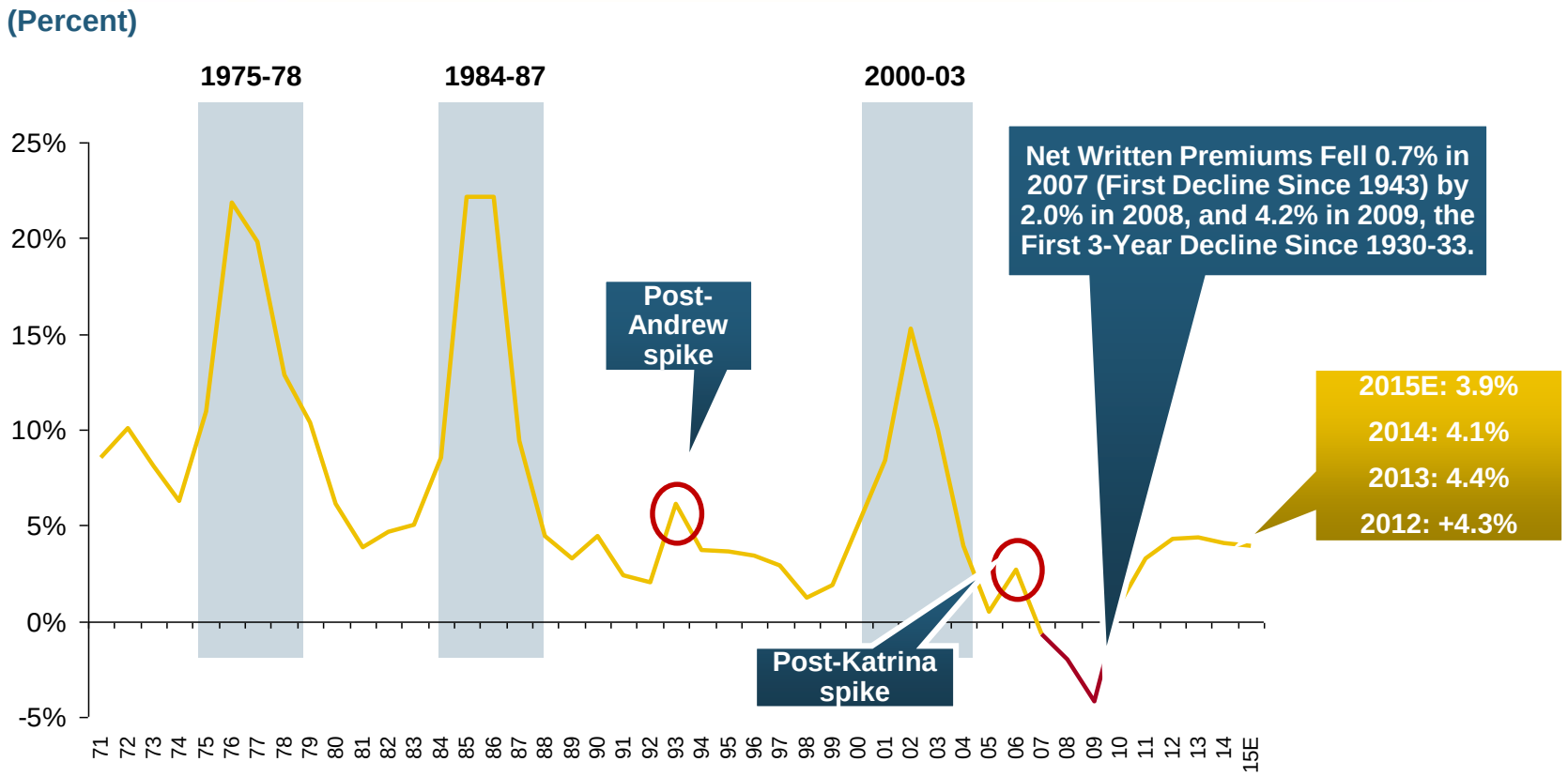
# Premium Growth

## Catastrophe Losses Impact Trajectory of Premium Growth

# Net Premium Growth: Annual Change, 1971—2015E




Shaded areas denote "hard market" periods
Sources: A.M. Best (historical and forecast), ISO, Insurance Information Institute.

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# www.iii.org

***Thank you for your time and your attention!***

***Twitter: twitter.com/bob_hartwig***

# Follow-up Information

Sharon Cooper – Media Spokesperson
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Source: FEMA

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# Press Question and Answer Process

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

An operator will facilitate your participation.

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Describe the impact of severe weather and how individuals, businesses, government, and insurers can work together to prepare for and mitigate weather risks.

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# First Half of 2015

July 14, 2015

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