2013 Half-Year Natural Catastrophe Review

July 9, 2013

Munich RE

Agenda

Welcome/Introduction
Terese Rosenthal

US/Global Natural Catastrophe Update
Carl Hedde

Special Topic: Convective Storms and Floods
Peter Höppe

Economic Implications of Natural Catastrophe Losses
Dr. Robert Hartwig

Questions and Answers

Webinar Interactivity

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

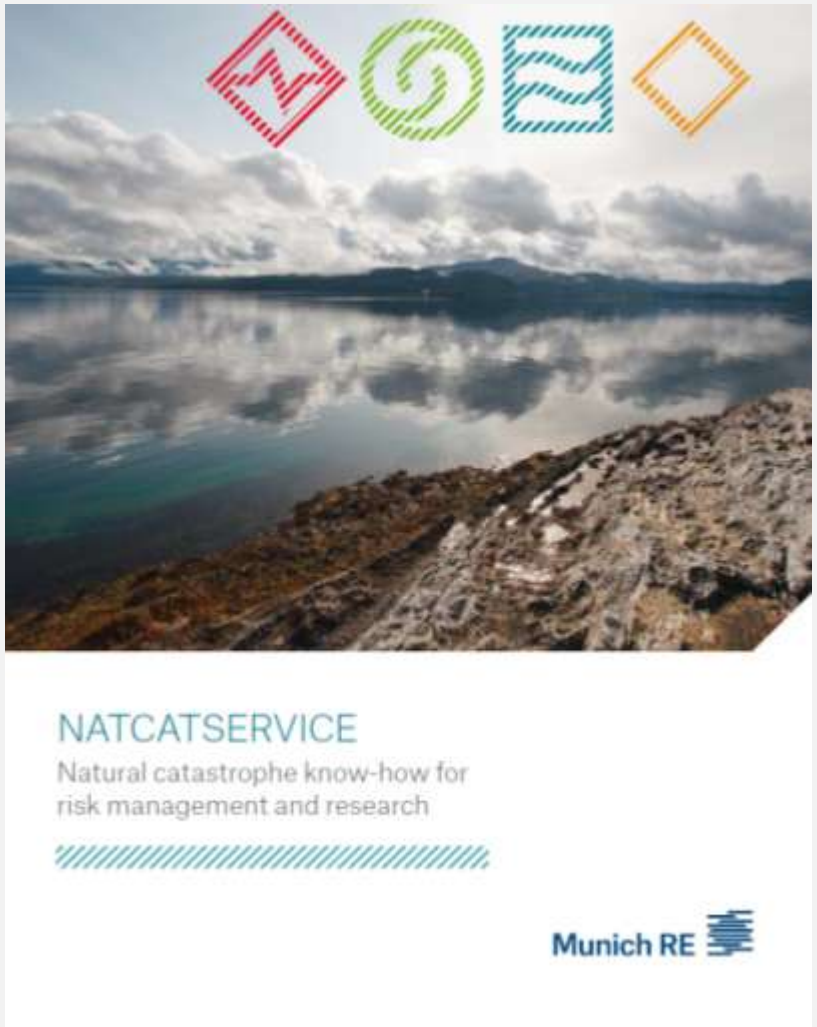
@Munichre_US @lworters @iiiorg #NATCAT2013

US/Global Natural Catastrophe Update

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

MR NatCatSERVICE

The world‘s largest database on natural catastrophes



The Loss Database Today

- 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. Vesuvio (3,000 historical data sets).
- **Currently more than 33,000 events**

2013 Headlines

- Insured losses in the United States during the first half of 2012 totaled $**7.9** billion – far below the 2000 to 2012 January – June average loss of $**13.8** billion (in 2013 Dollars).
- Despite a relatively quiet year for tornadoes, insured losses from thunderstorm events exceeded $**6.0** billion.
- Severe drought cripples agriculture over large section of central United States.
- Dry conditions lead to the most damaging wildfire in Colorado history, breaking the previous record set in 2012.

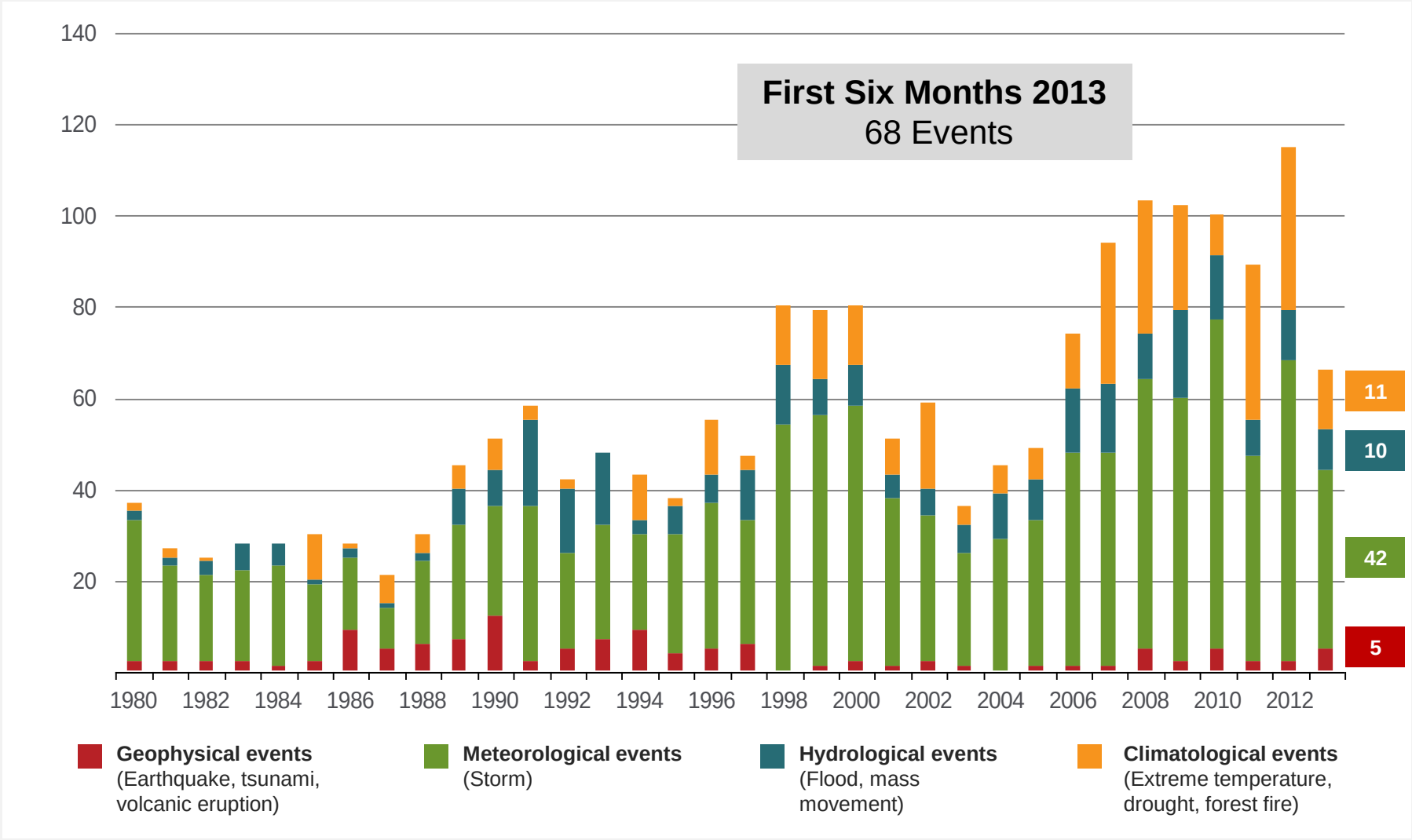
Natural Disaster Losses in the United States, 2013

As of July 1, 2013	Number of Events	Fatalities	Estimated Overall Losses (US $m)	Estimated Insured Losses (US $m)
Severe Thunderstorm	29	66	10,180	6,325
Winter Storm	13	17	2,434	1,255
Flood	10	9	500	Minor
Earthquake & Geophysical	5	0	Minor	Minor
Tropical Cyclone	1	1	Minor	Minor
Wildfire, Heat, & Drought	11	23	700	365
Totals	**68**	**116**	**13,814**	**7,945**

Source: MR NatCatSERVICE

Natural Disasters in the United States, 1980 – 2013

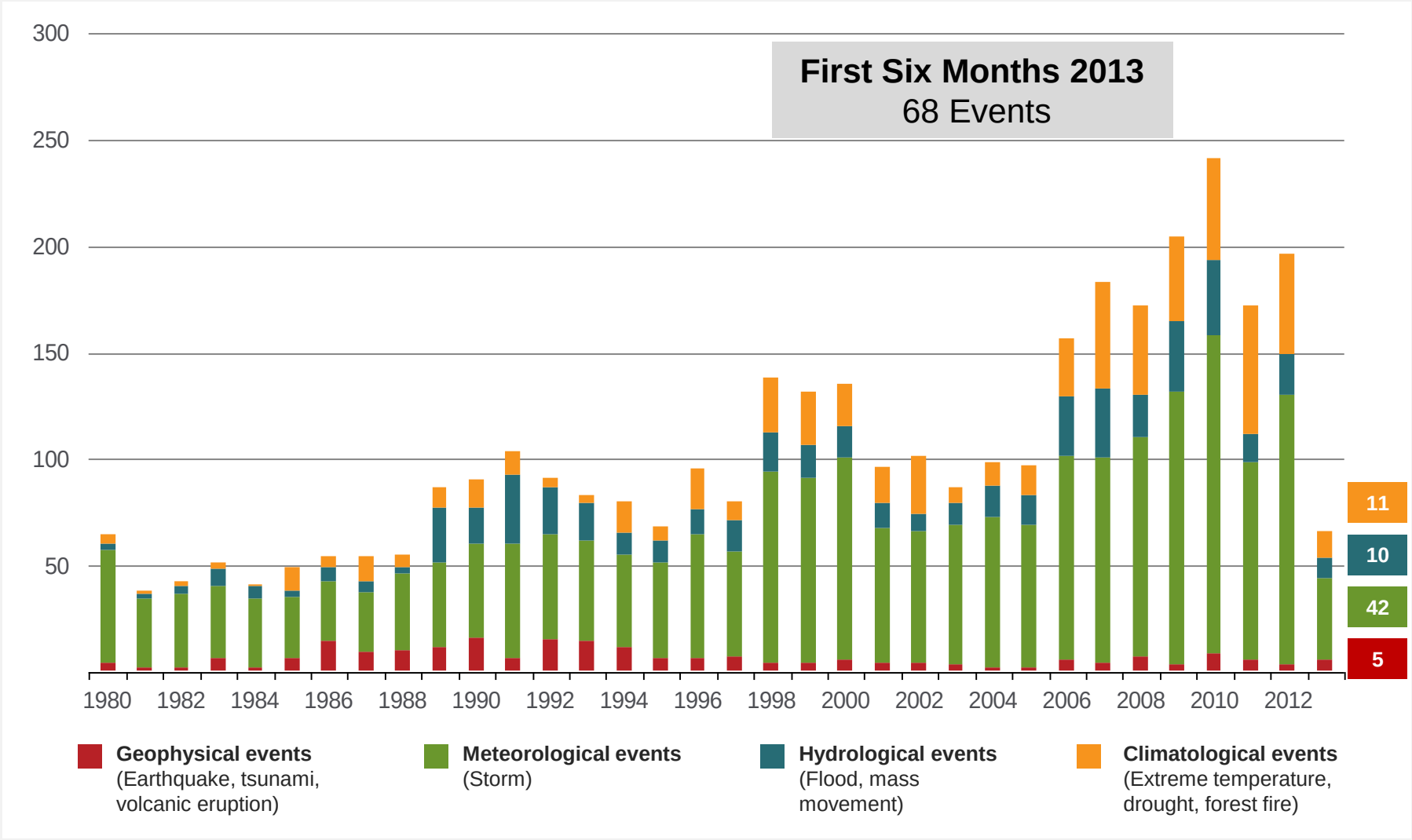
Number of Events, January – June only



Source: MR NatCat*SERVICE*

Natural Disasters in the United States, 1980 – 2013

Number of Events (Annual Totals 1980 – 2012 vs. First Six Months 2013)

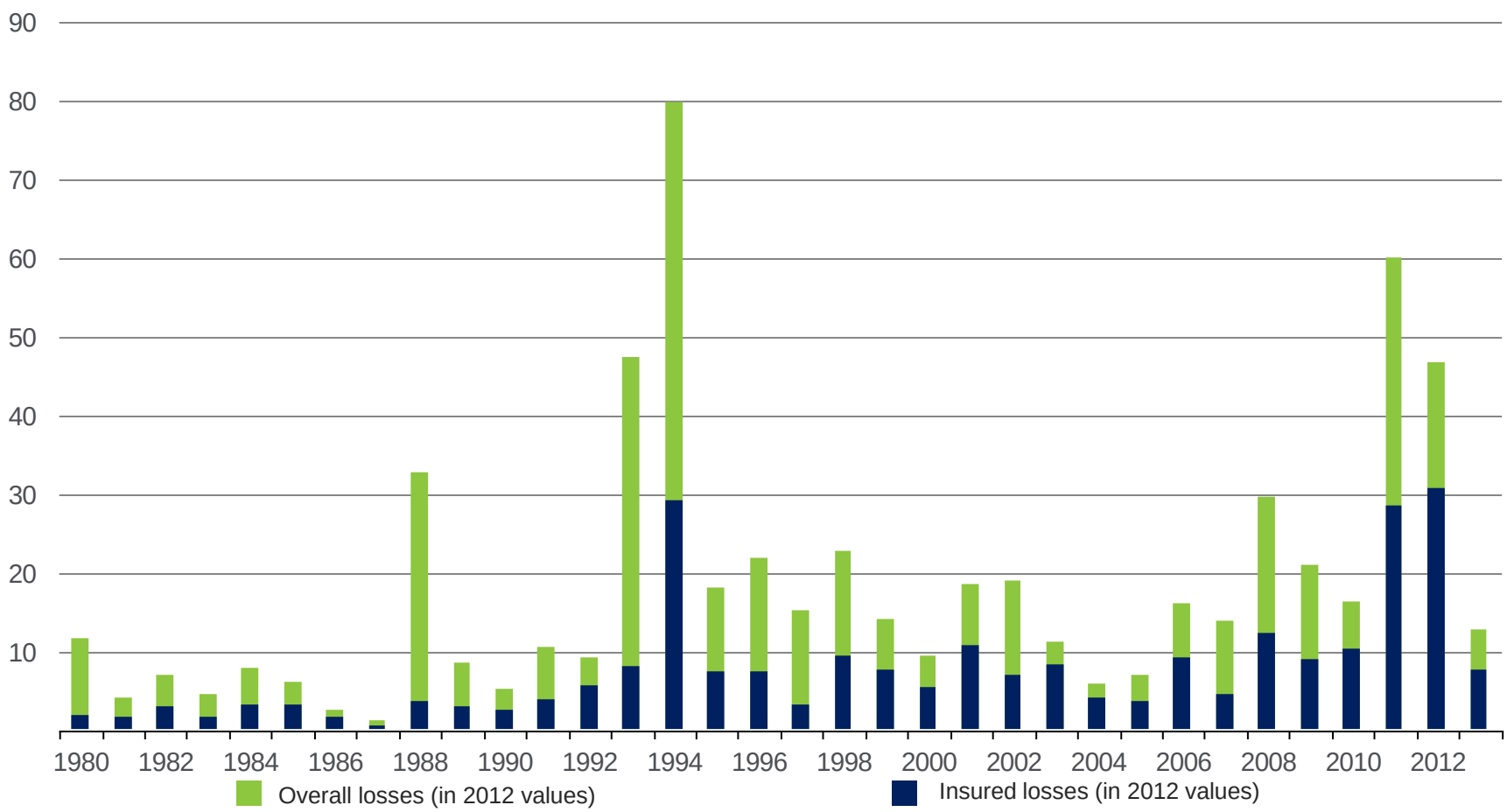


Source: MR NatCat*SERVICE*

Losses Due to Natural Catastrophes in the United States

1980 – 2013 (Jan – June only)

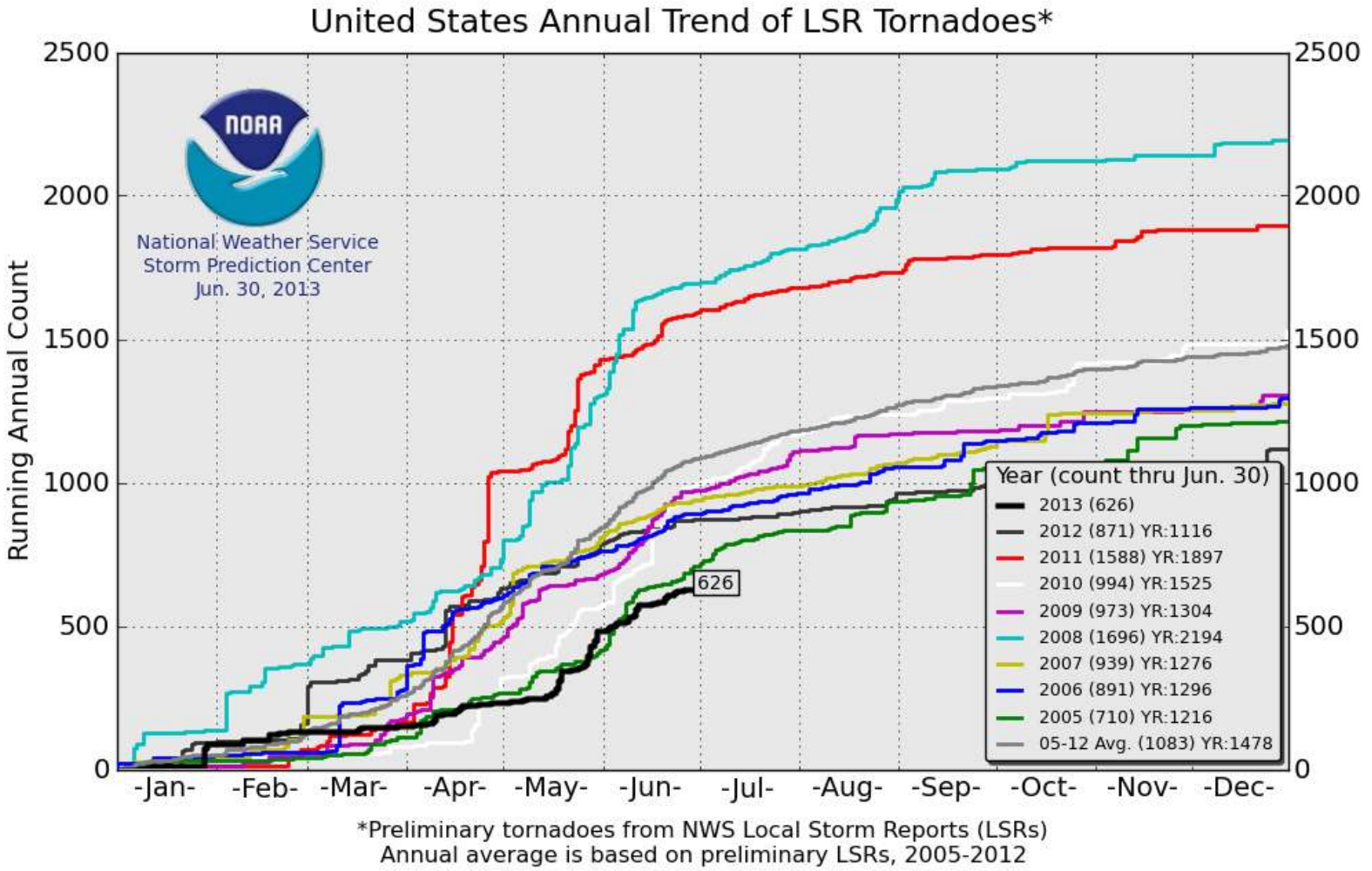
Insured losses in the US totaled US$ 7.9bn



Sources: MR NatCatSERVICE, Property Claims Services

2013 US Thunderstorm Season

US Tornado Count
First Half 2013

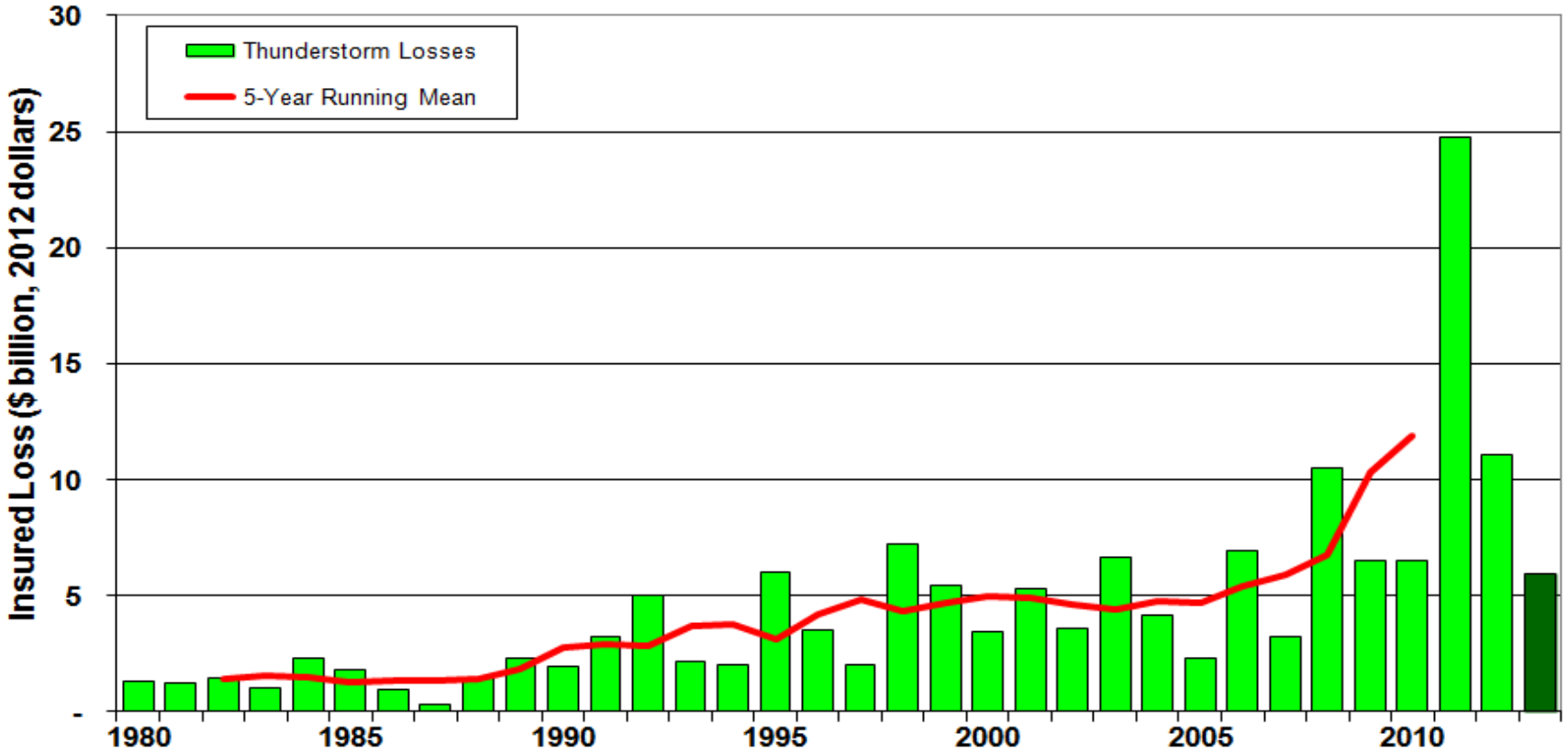


US Thunderstorm Loss Trends

January – June only, 1980 - 2012

Munich RE

Thunderstorm losses for the period January – June in 2013 are lower than the past two years, but in line with experience over the past 10 years.



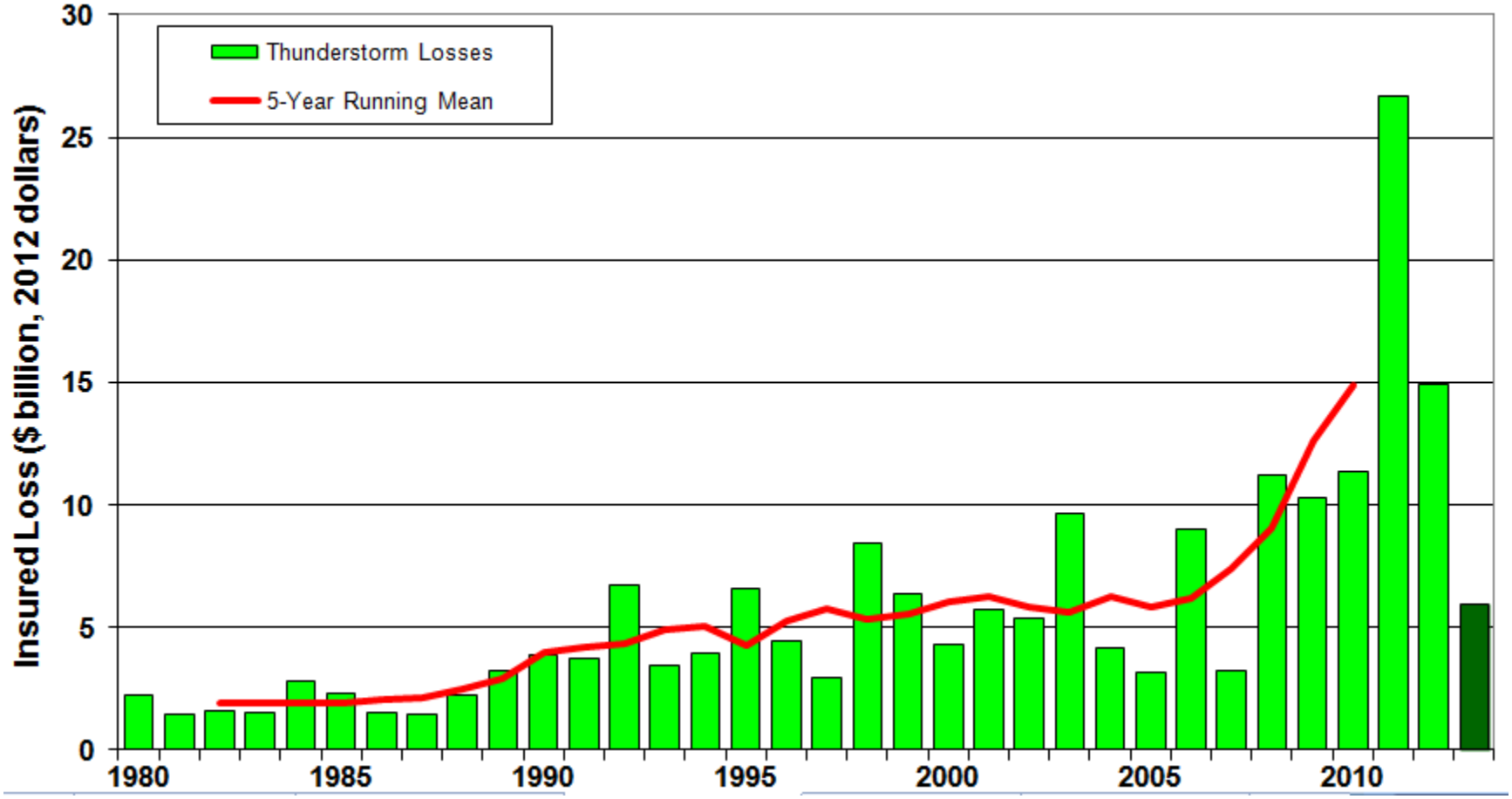
Source: Property Claims Service
MR NatCat*SERVICE*

US Thunderstorm Loss Trends

Annual Totals 1980 – 2013 YTD

Munich RE

Average thunderstorm losses have increased sevenfold since 1980.



Source: Property Claims Service
MR NatCat*SERVICE*

Notable Thunderstorm Events
First Half 2013

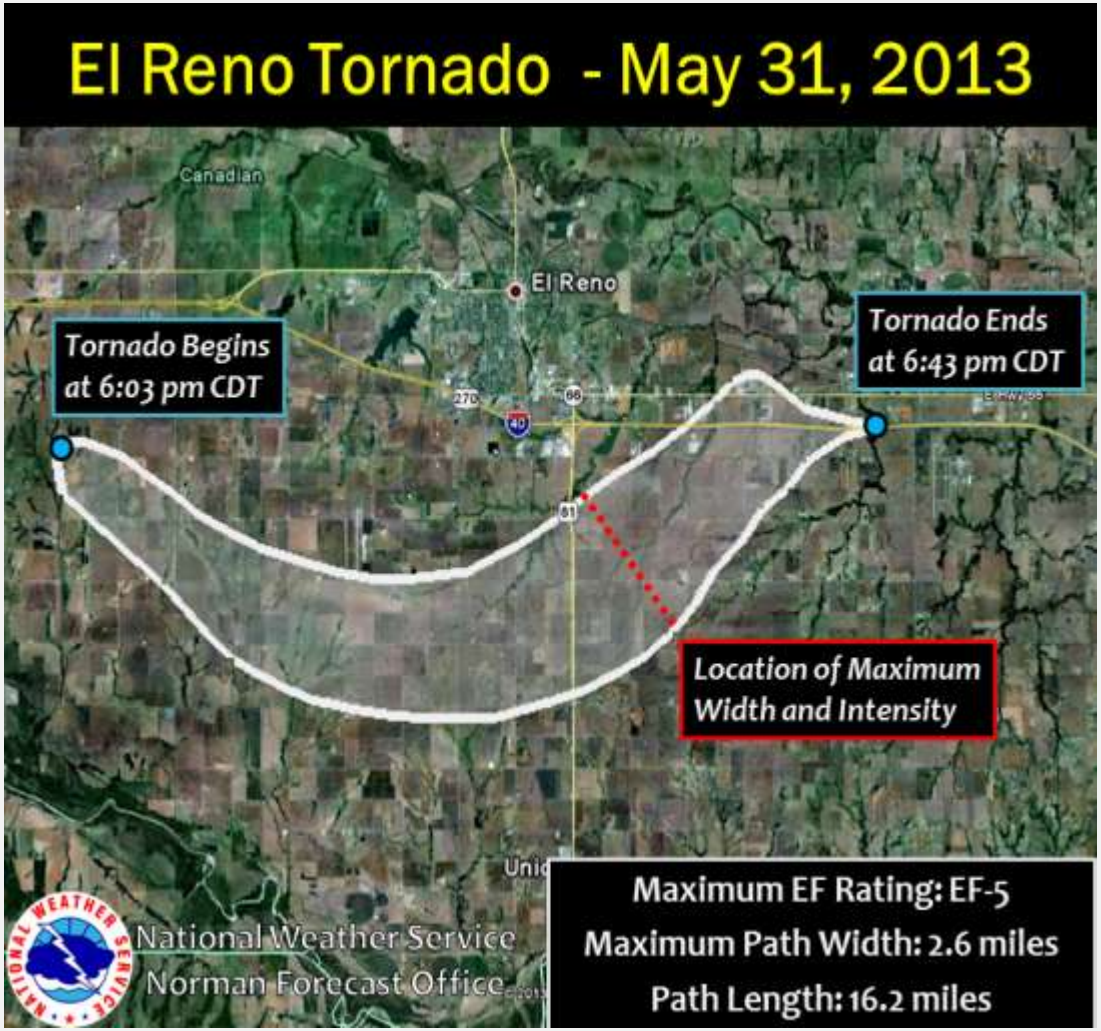
May 18-20: Large outbreak of over 60 tornadoes across the midwest and southern Great Plains. Moore, Oklahoma, was hit by an EF5 tornado (5th tornado strike of EF2 or above in the town since 1998). Thousands of homes, 2 schools, and a hospital destroyed. Overall insured losses from the outbreak are estimated at US$ 1.6 billion.

Source: FEMA

Source: Property Claims Service
MR NatCat*SERVICE*

Notable Thunderstorm Events
First Half 2013

May 28-31: Another large outbreak occurred over the southern Plains. The city of El Reno, Oklahoma, was hit by an EF5 tornado that possessed the largest diameter ever observed in a tornado, over 2 miles. Fortunately, downtown El Reno was not hit. Overall insured losses from the outbreak are estimated at US$ 815 million.



Source: NWS

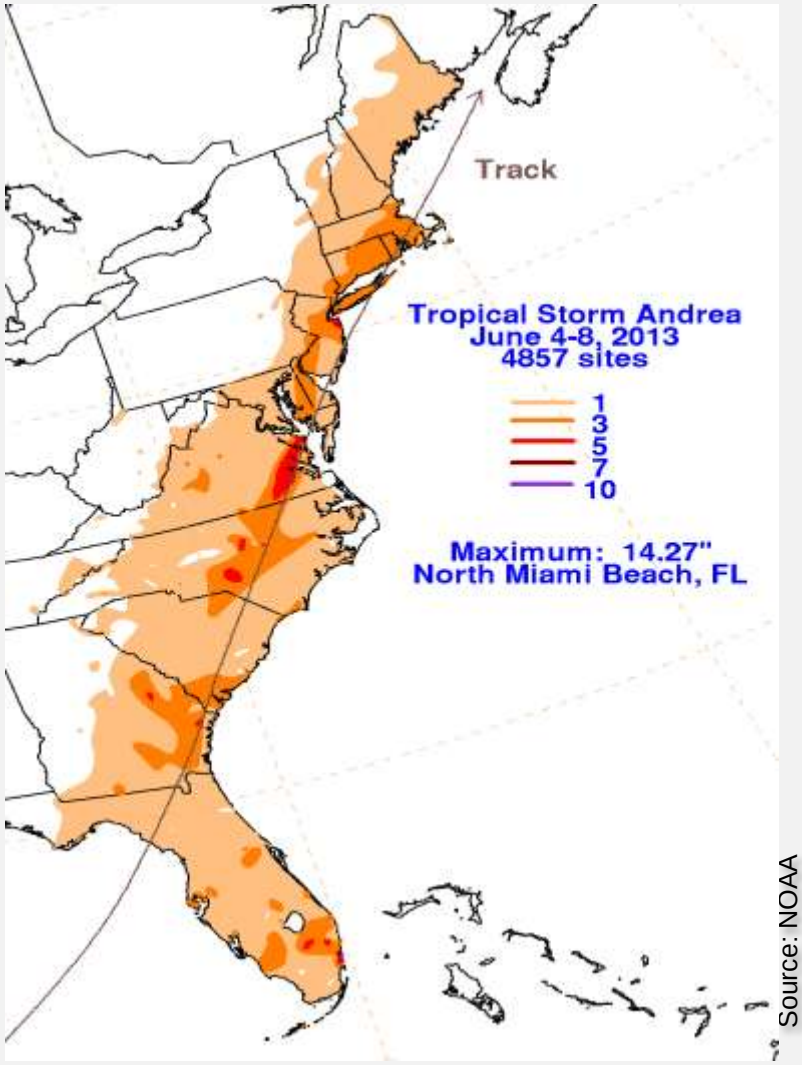
US Tropical Cyclones 2013

U.S. Tropical Cyclones in 2013

First Six Months 2013

Tropical Storm Andrea

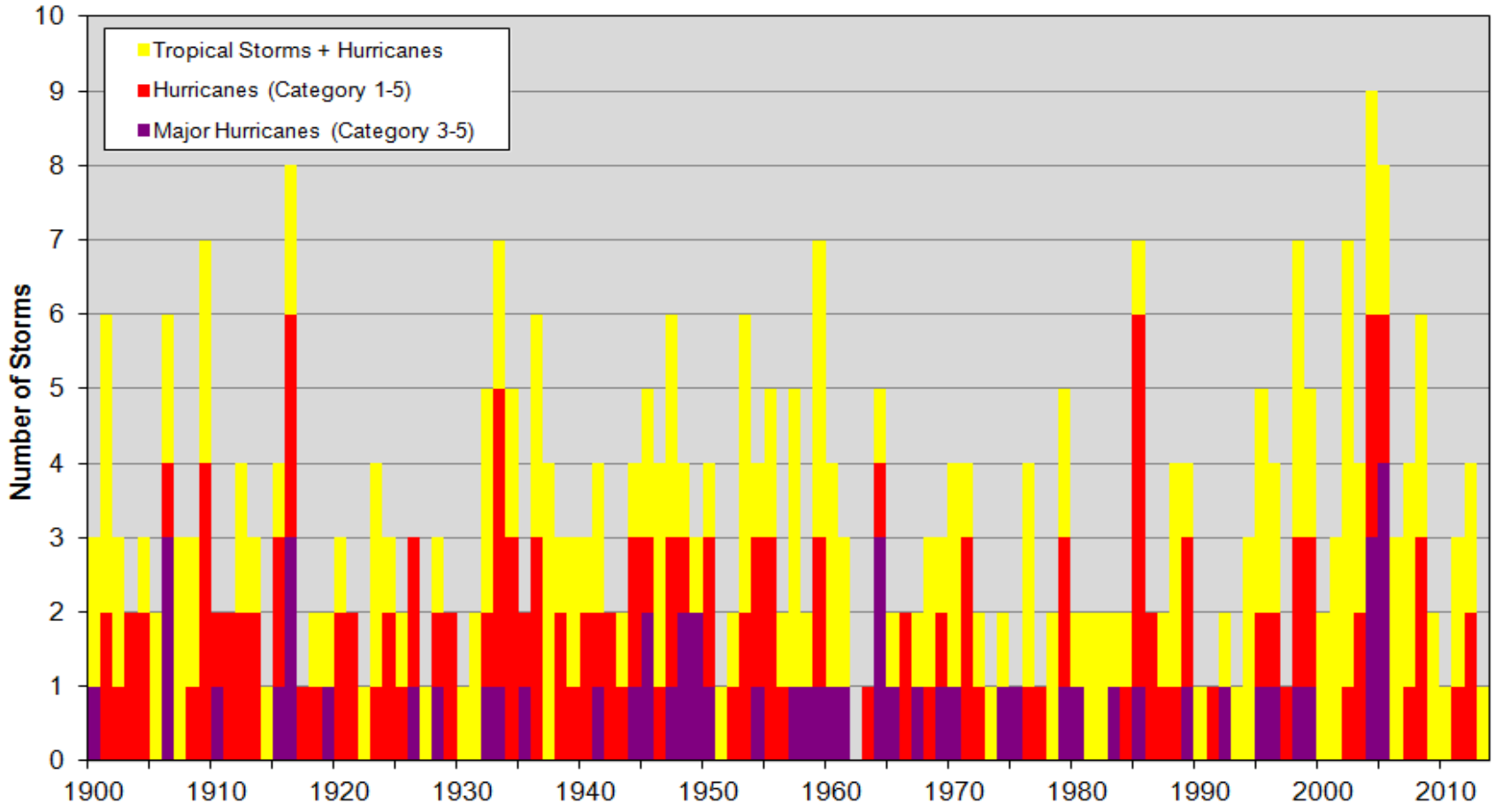
- Landfall on June 6 near Cedar Key, Florida as a tropical storm with sustained winds of 65 mph.
- Minor wind damage in Florida, storm and its remnants causes localized flooding along length of eastern seaboard.



Number of US Landfalling Tropical Cyclones 1900 – 2013 YTD

Munich RE

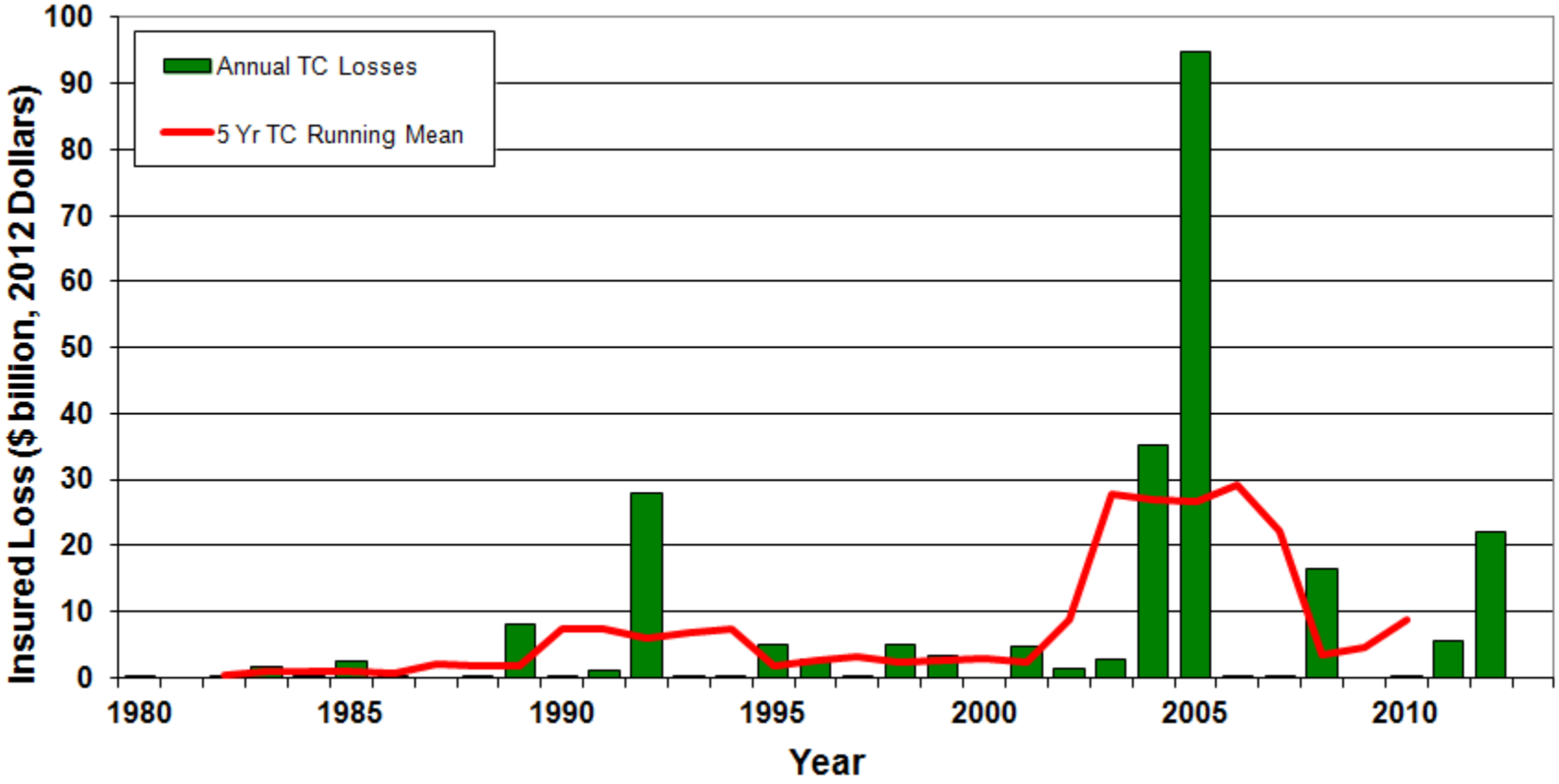
There has not been a major hurricane landfall in the US since Wilma in 2005.



Source: NOAA

Insured US Tropical Cyclone Losses, 1980 - 2013

The current 5-year average (2008-2012) for privately insured tropical cyclone losses are $8.8 billion per year.



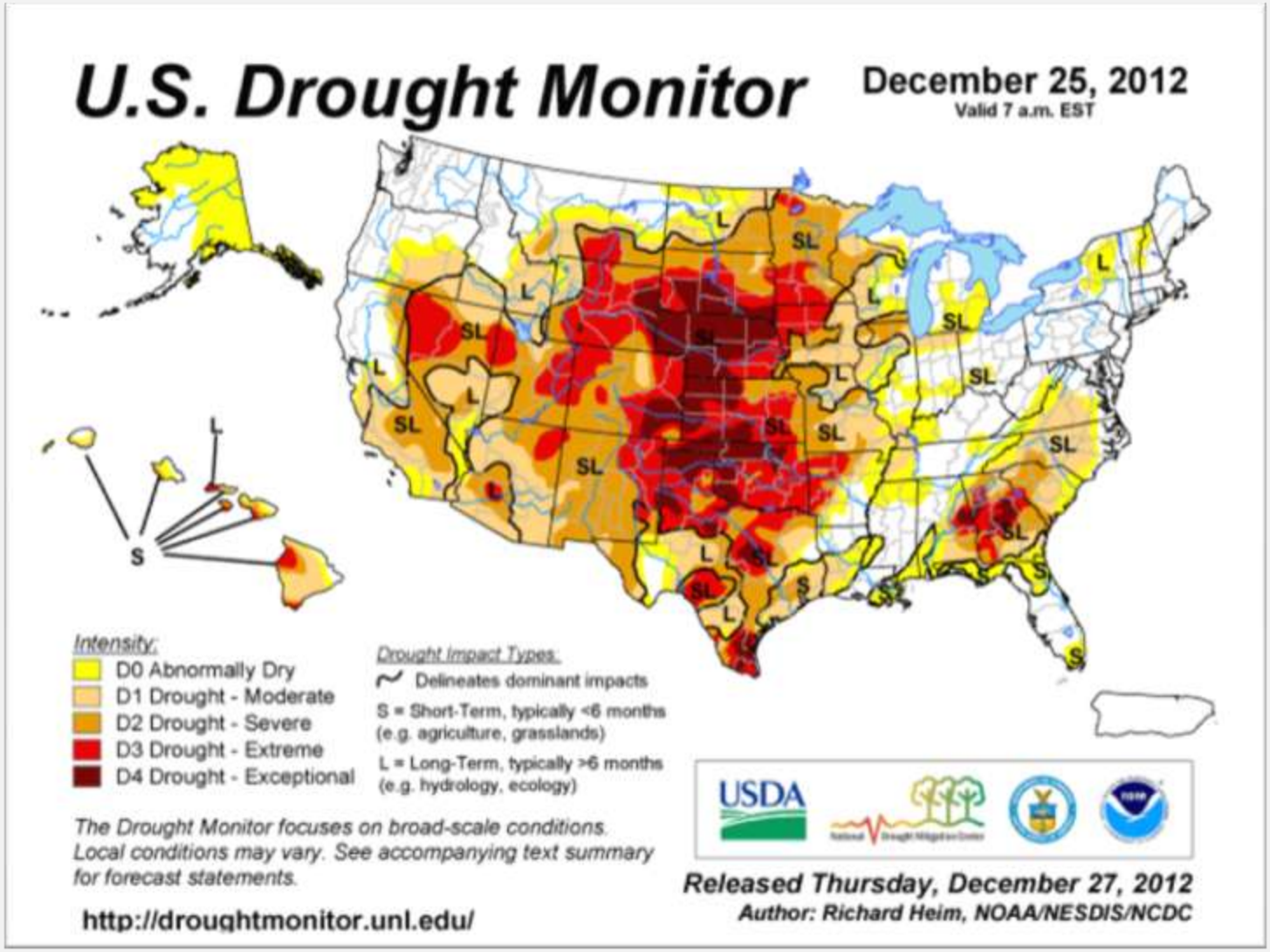
Sources: Property Claims Service, MR NatCat*SERVICE*, NFIP

© 2013 Munich Re

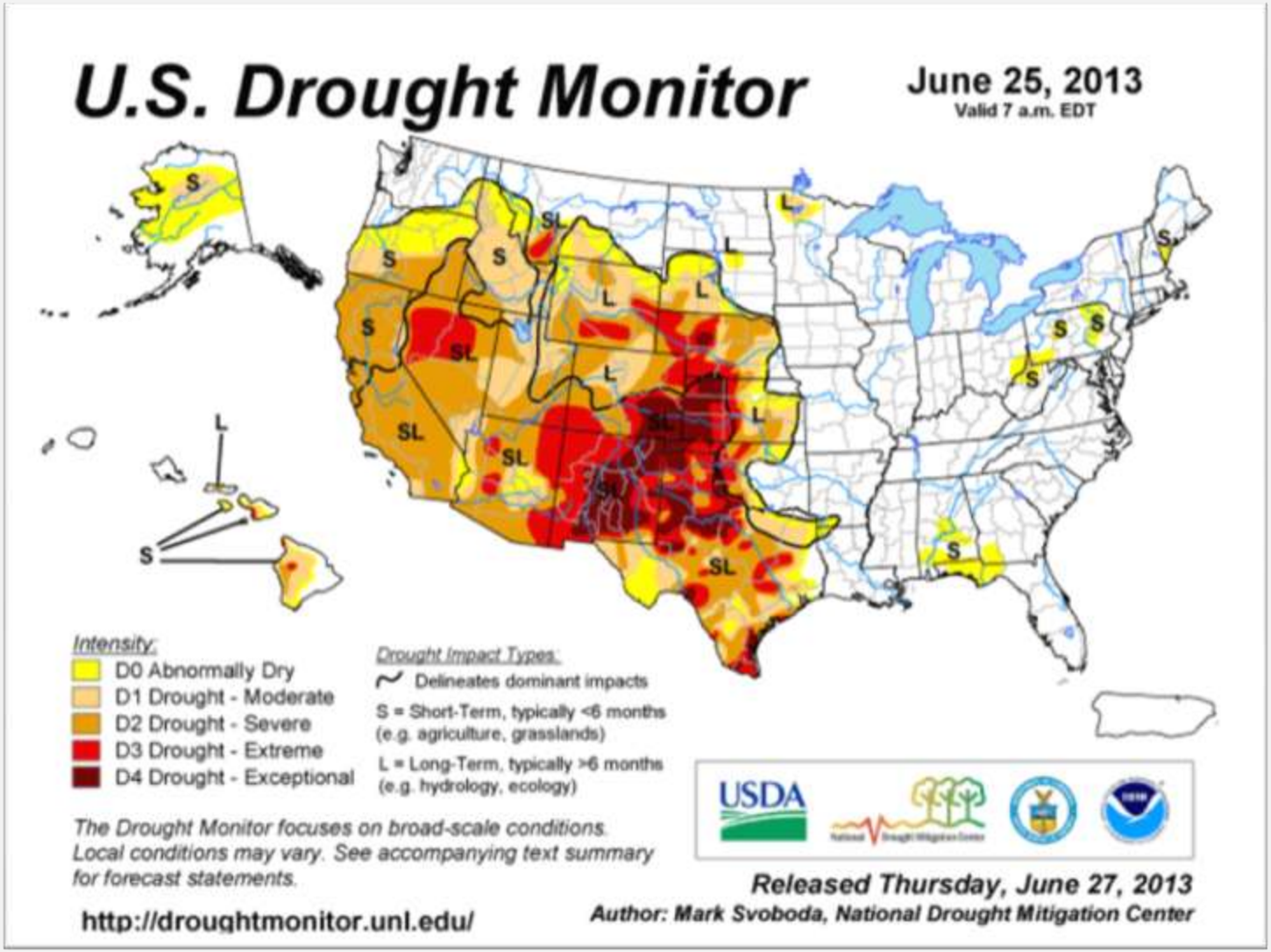
Other US Natural Catastrophes in 2013

Source: NASA

US Drought Conditions in December 2012

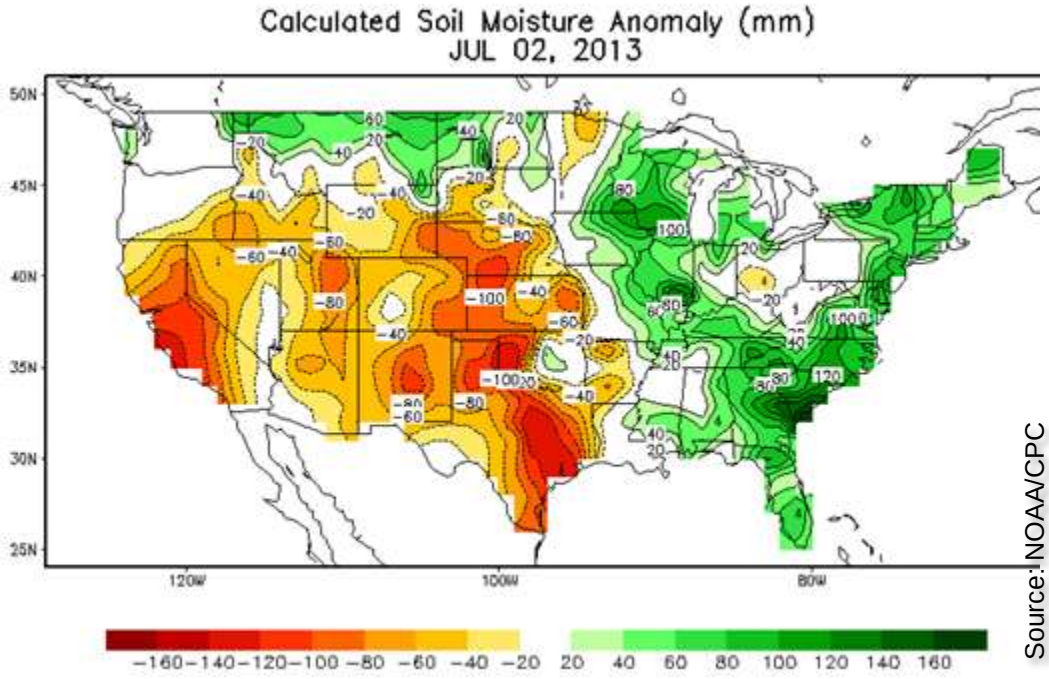


Current US Drought Conditions

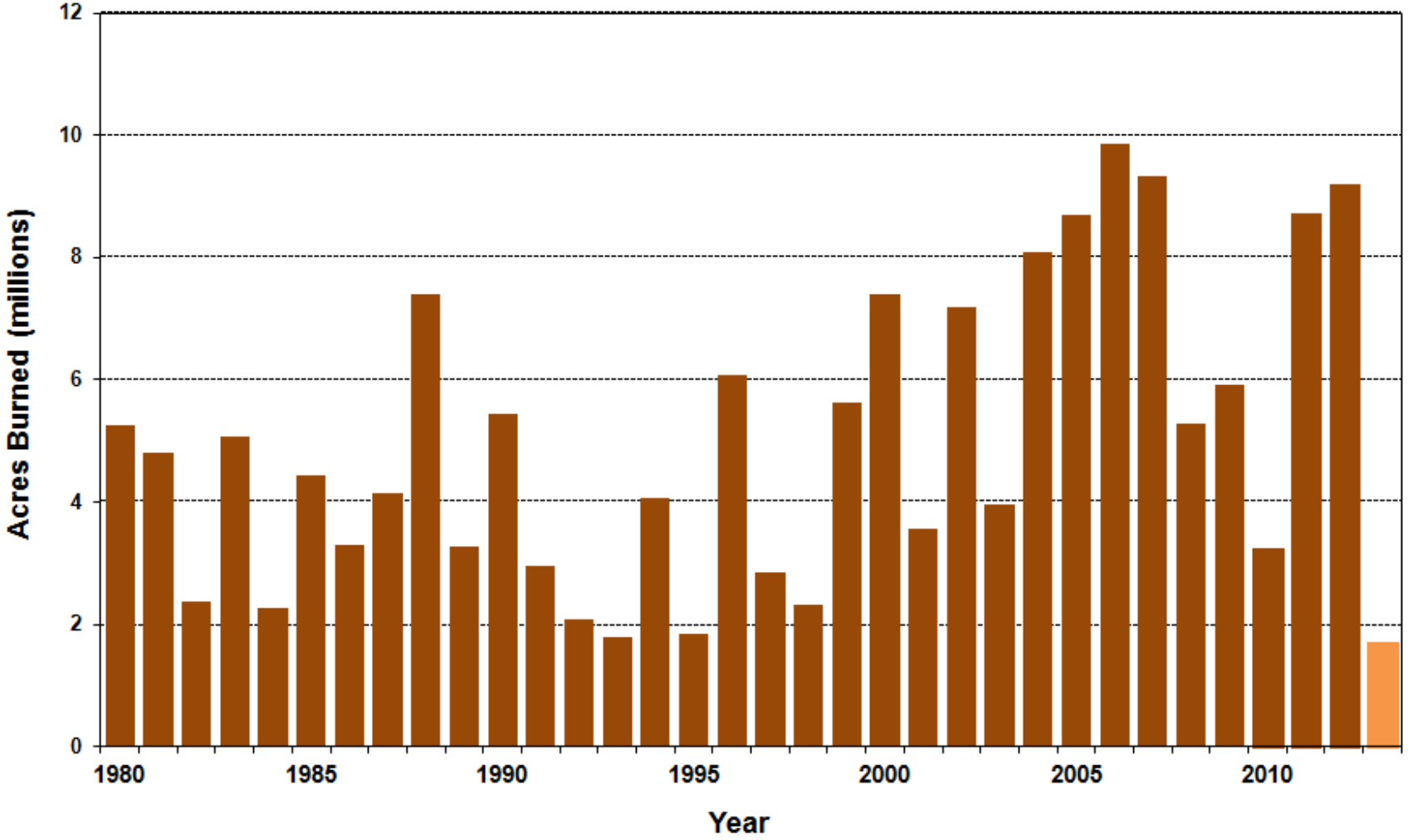


2013 Western US Drought Impacts

- Severe drought continues over large area of western United States, encompassing 15 states and almost of half of the area of the lower 48 states.
- Severe damage to crops (soybeans, sorghum) and livestock
- Record setting heat in the desert southwest.
- Ongoing economic losses from the drought are estimated at over $20 billion



Number of Acres Burned in Wildfires, 1980 – 2013 YTD



Source: National Interagency Fire Center

Notable Wildfires in 2013

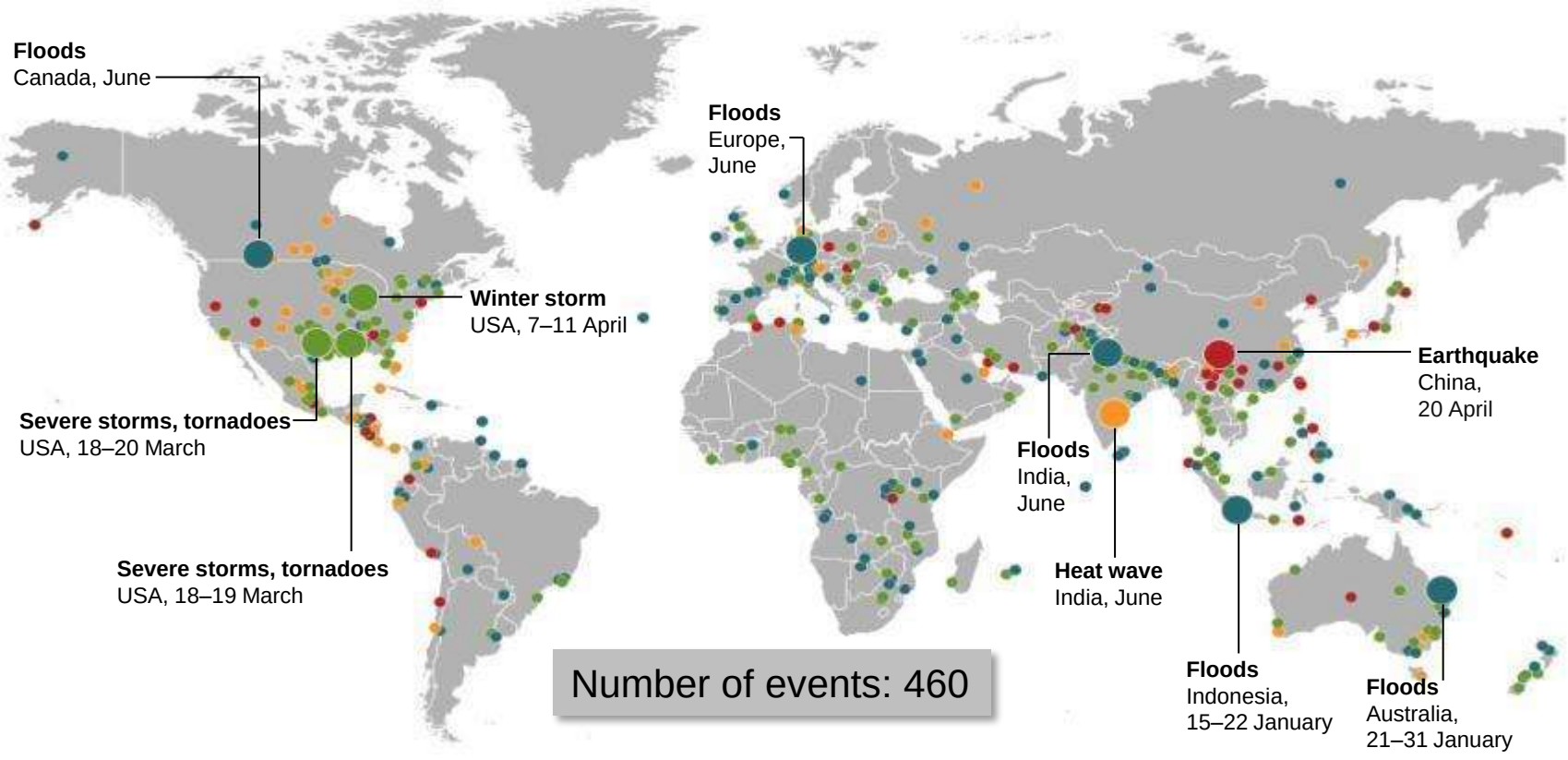
- **Colorado:** “Black Forest” fire near Colorado Springs destroyed 511 homes, becoming the most damaging fire in state history, surpassing the losses from the “Waldo Canyon” fire in 2012. The insured loss estimate from this fire is US$ 365m.
- **Arizona: “**Yarnell Hill” fire near Prescott consumes over 8,400 acres, destroys over 200 buildings, and claimed the lives of at least 19 firemen, the sixth-worst loss of firemen from a single event in U.S. history.

Source: USDA

Global Natural Catastrophe Update

Natural Catastrophes January – June 2013

World map with significant events



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

Natural Catastrophes Worldwide 2013

Overview and Comparison with Previous Years

	2013 (Jan – June)
Number of events	460
Overall losses in US$m (original values)	45,000
Insured losses in US$m (original values)	13,000
Fatalities	4,000

Source: MR NatCatSERVICE

© 2013 Munich Re

Natural Catastrophes Worldwide 2013

Overview and Comparison with Previous Years

	2013 (Jan – June)	2012 (Jan – June)
Number of events	460	520
Overall losses in US$m (original values)	45,000	58,000
Insured losses in US$m (original values)	13,000	19,000
Fatalities	4,000	4,500

Source: MR NatCat*SERVICE*

Natural Catastrophes Worldwide 2013

Overview and Comparison with Previous Years

	2013 (Jan – June)	2012 (Jan – June)	Average of the last 10 years 2003-2012 (Jan –June)
Number of events	460	520	390
Overall losses in US$m (original values)	45,000	58,000	85,000
Insured losses in US$m (original values)	13,000	19,000	22,000
Fatalities	4,000	4,500	53,000

Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 2013

Overview and Comparison with Previous Years

	2013 (Jan – June)	2012 (Jan – June)	Average of the last 10 years 2003-2012 (Jan –June)	Average of the last 30 years 1983-2012 (Jan –June)
Number of events	460	520	390	300
Overall losses in US$m (original values)	45,000	58,000	85,000	61,600
Insured losses in US$m (original values)	13,000	19,000	22,000	13,500
Fatalities	4,000	4,500	53,000	30,000

Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 2013

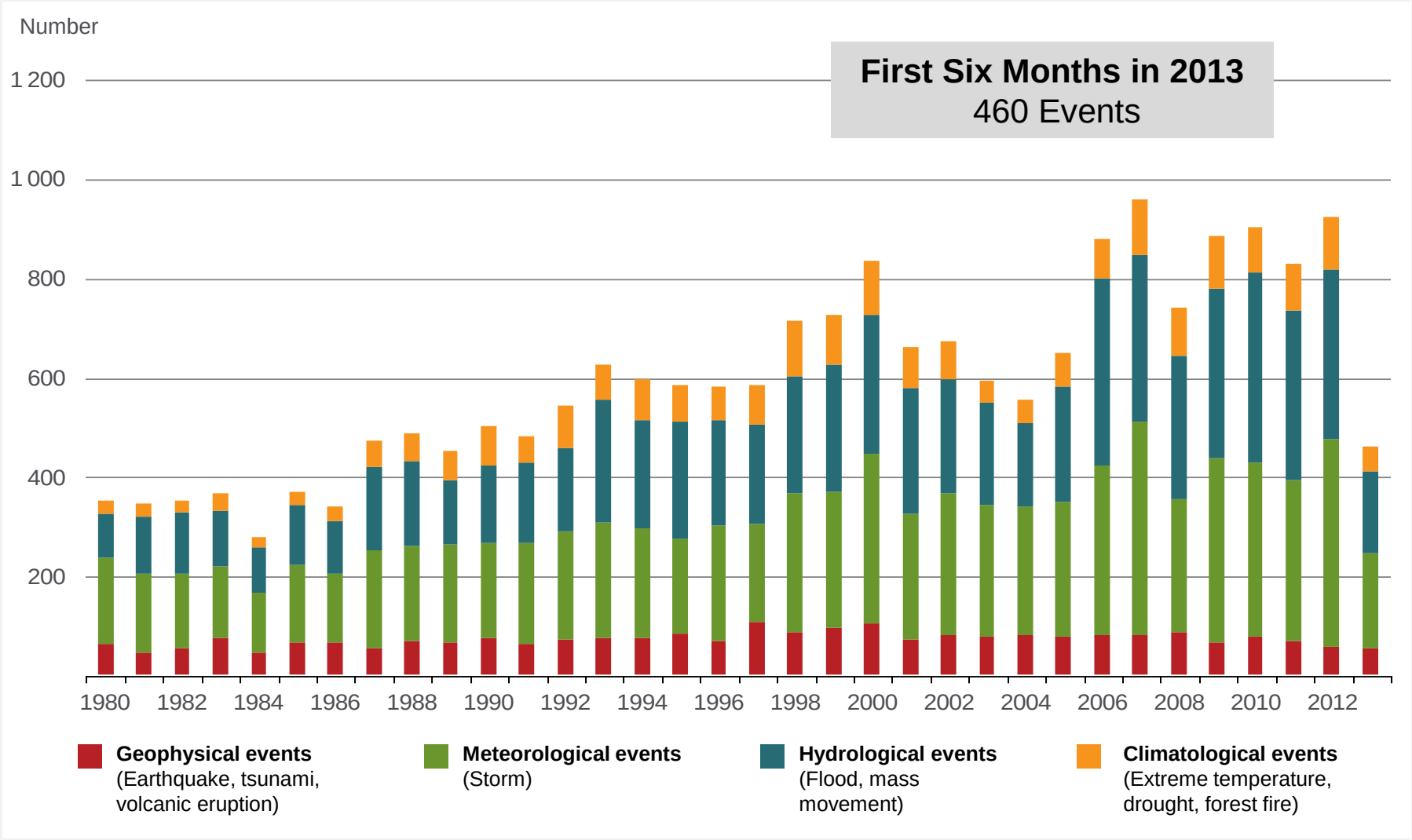
Overview and Comparison with Previous Years

	2013 (Jan – June)	2012 (Jan – June)	Average of the last 10 years 2003-2012 (Jan –June)	Average of the last 30 years 1983-2012 (Jan –June)	Top Year 1983 -2012 (Jan – June)
Number of events	460	520	390	300	**2012** 620
Overall losses in US$m (original values)	45,000	58,000	85,000	61,600	**2011** (EQ Japan) 302,000
Insured losses in US$m (original values)	13,000	19,000	22,000	13,500	**2011** (EQ, Japan) 82,000
Fatalities	4,000	4,500	53,000	30,000	**2010** (EQ Haiti) 230,000

Source: MR NatCat*SERVICE*

Natural Catastrophes Worldwide 1980 – 2013

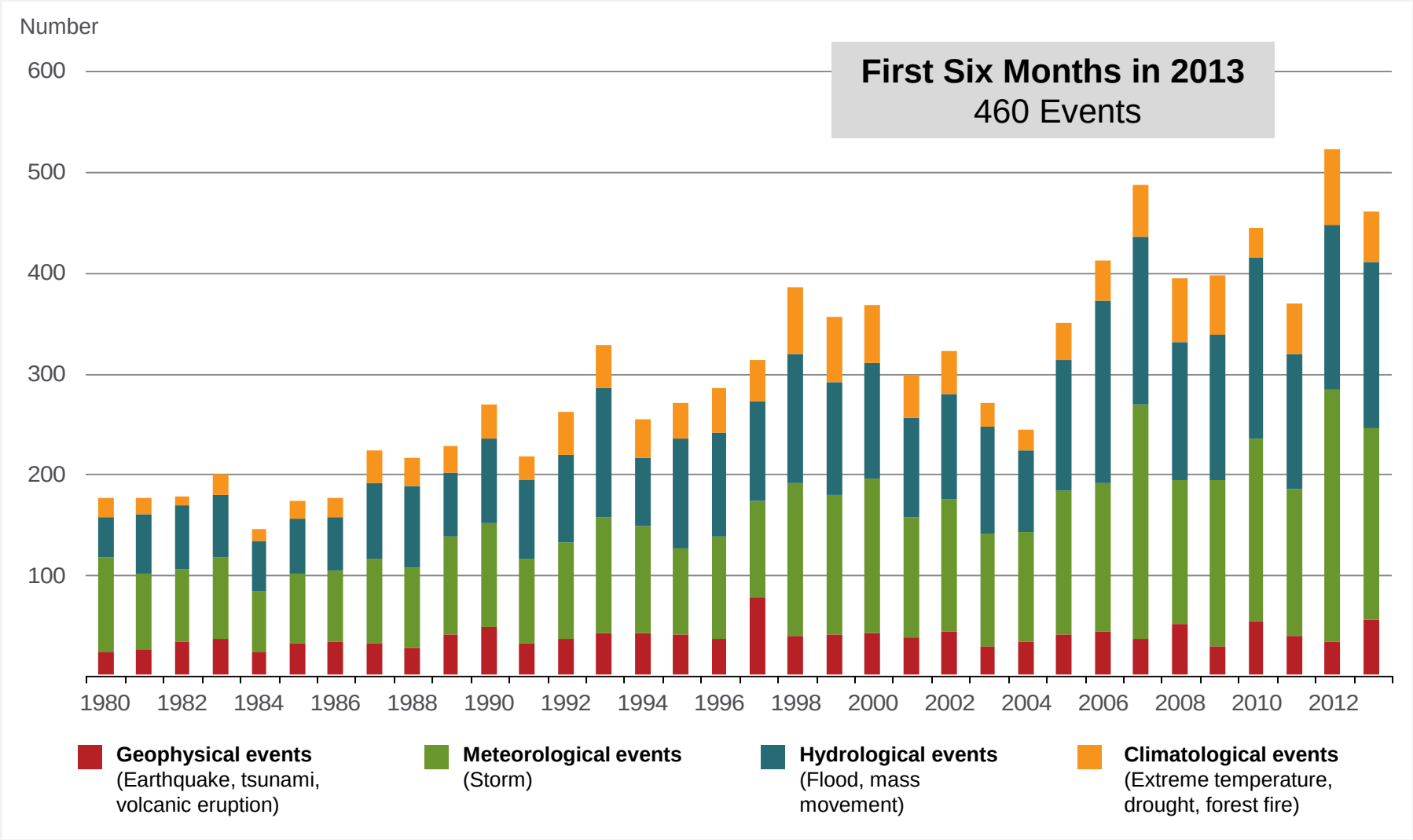
Number of Events (Annual Totals 1980 – 2012 vs. First Six Months 2013)



Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 1980 – 2013

Number of Events (January – June only)



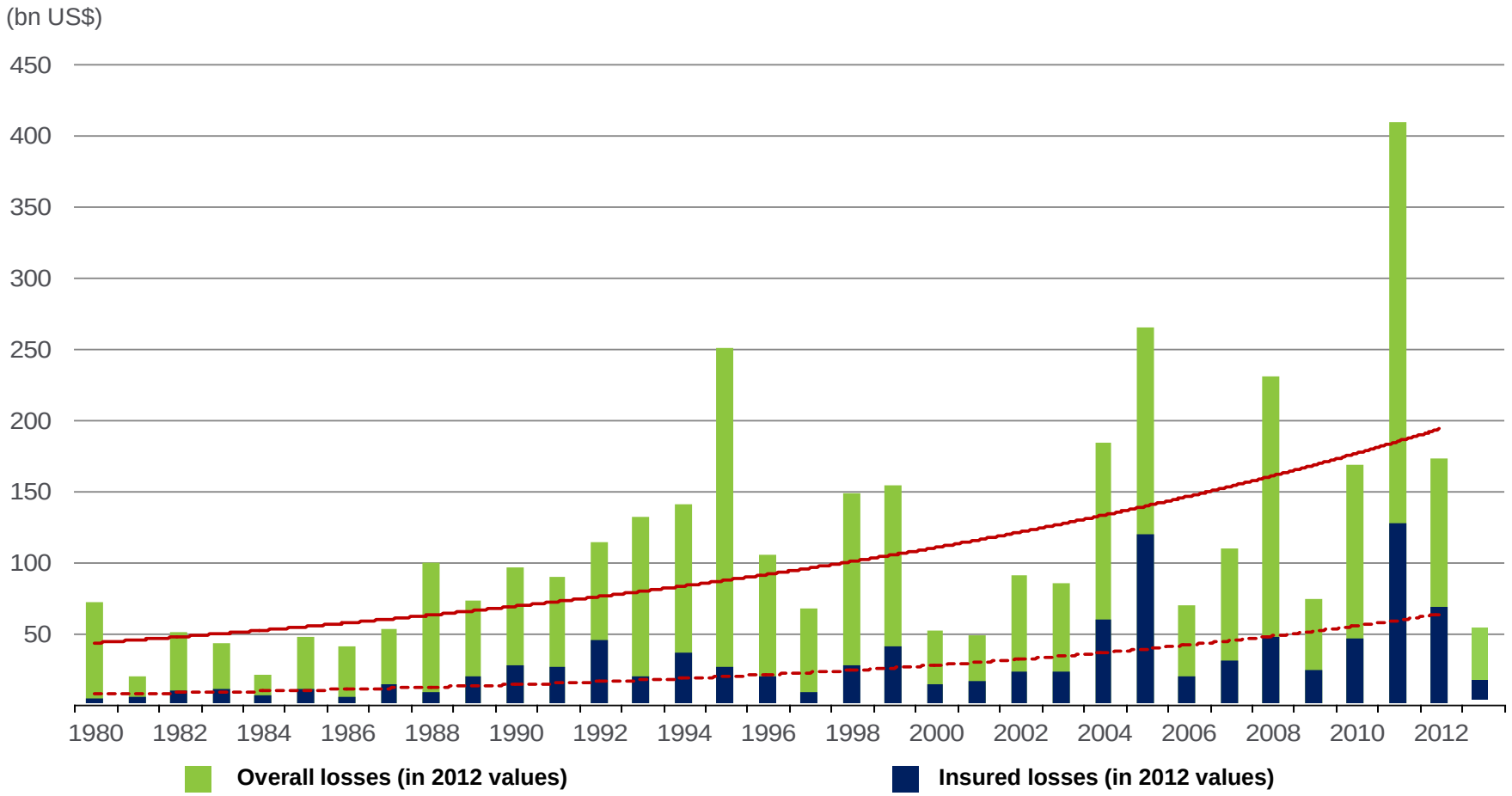
Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 1980 – 2013

Overall and Insured Losses (Annual Totals 1980 – 2012 vs. First Six Months 2013)

Munich RE

Overall losses totaled US$ 45bn; Insured losses totaled US$ 13bn



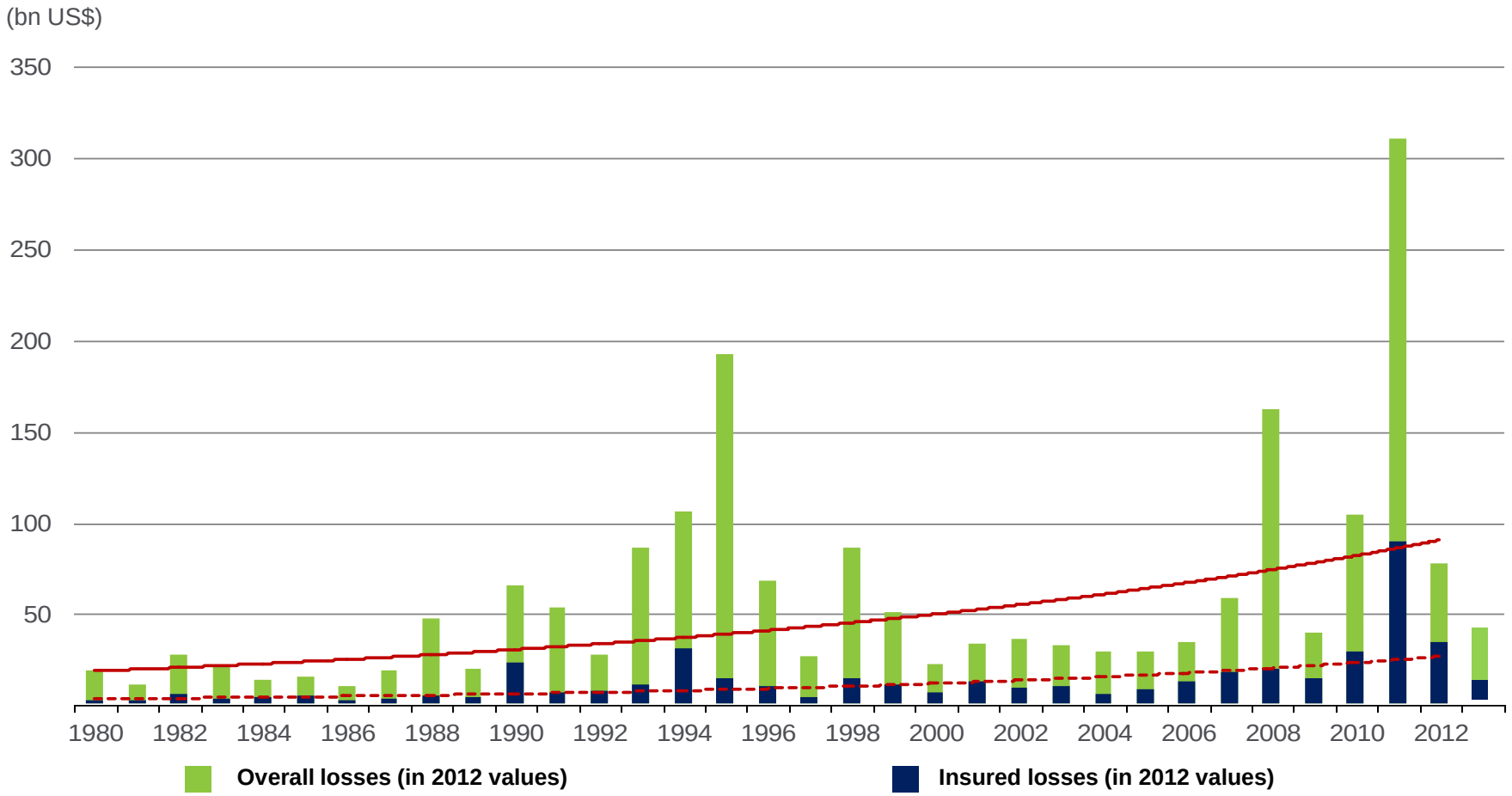
Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 1980 – 2013

Overall and Insured Losses (January – June only)

Munich RE

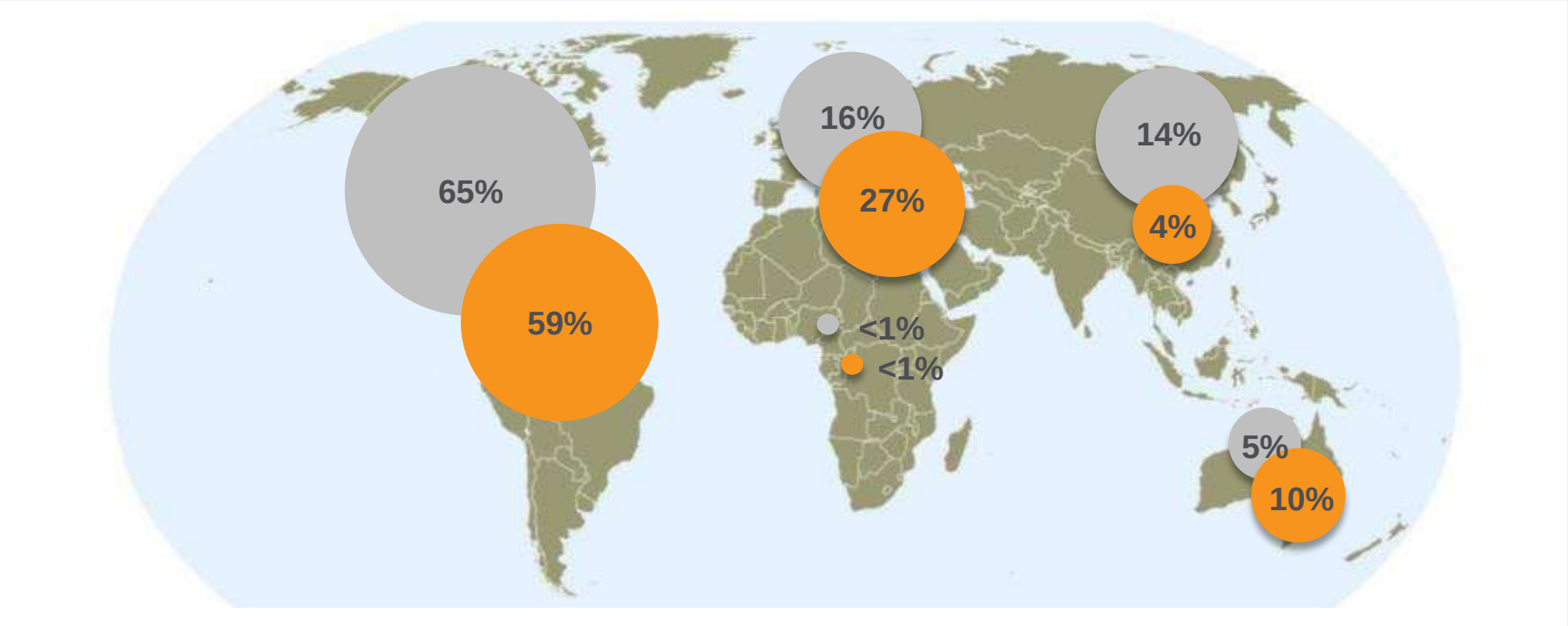
Overall losses totaled US$ 45bn; Insured losses totaled US$ 13bn



Source: MR NatCatSERVICE

Natural Catastrophes: Comparison of Insured Losses

Percentage Distribution – Annual Totals 1980 – 2012 vs. First Six Months 2013



Insured losses	US$
1980 – 2012 (annual totals):	970bn* *losses in 2012 values
2013 (first six months):	13bn

Source: MR NatCatSERVICE

Natural Catastrophes Worldwide 2013

The Five Costliest Natural Catastrophes for the Insurance Industry

Date	Region	Event	Fatalities	Overall losses US$ m	Insured losses US$ m
June 2013	Europe	Floods	22	>16,000*	~3,900*
18-20.5.2013	USA	Thunderstorms, tornado	26	3,100	1,575
18-19.3.2013	USA	Thunderstorms	2	2,000	1,415
June 2013	Canada	Floods	3	>3,000*	>1,000*
21-31.1.2013	Australia	Floods	6	2,000	1,100

*Loss estimation in progress

Source: PCS - Property Claim Services

Costliest Natural Catastrophes Since 1950

Rank by Insured Losses

Year	Event	Region	Insured loss US$m (in original values)
2005	Hurricane Katrina	USA	62,200
2011	EQ, tsunami	Japan	40,000
2012	Hurricane Sandy	USA, Caribbean	30,150
2008	Hurricane Ike	USA, Caribbean	18,500
1992	Hurricane Andrew	USA	17,000
2011	Floods	Thailand	16,000
2012	Drought	USA	16,000
1994	EQ Northridge	USA	15,300
2004	Hurricane Ivan	USA, Caribbean	13,800
2011	EQ Christchurch	New Zealand	13,000

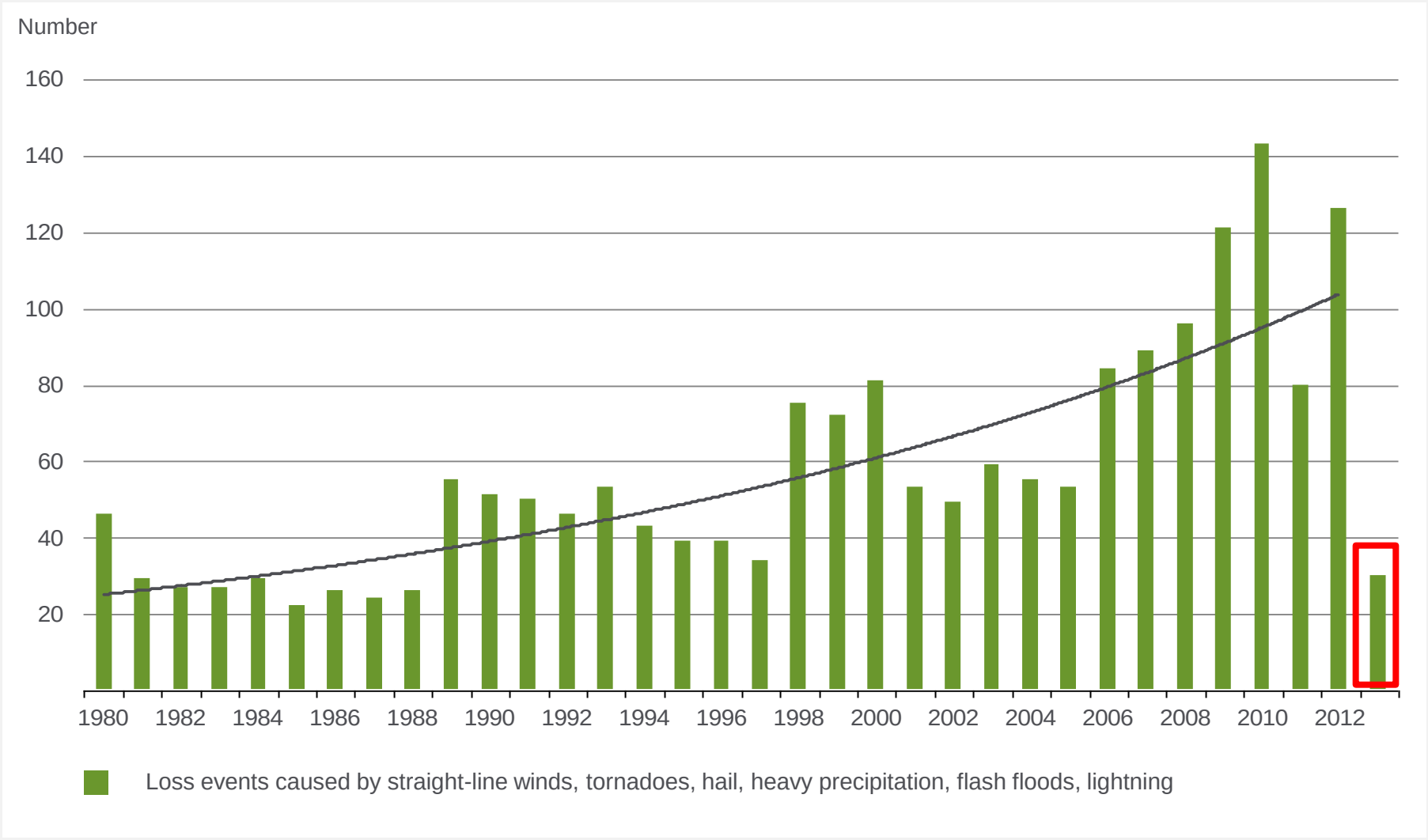
Source: MR NatCatSERVICE

Special Topic:
Convective Storms and Floods

Prof. Dr. Peter Höppe,
Head Geo Risks Research/Corporate Climate Centre,

Convective loss events in the U.S.

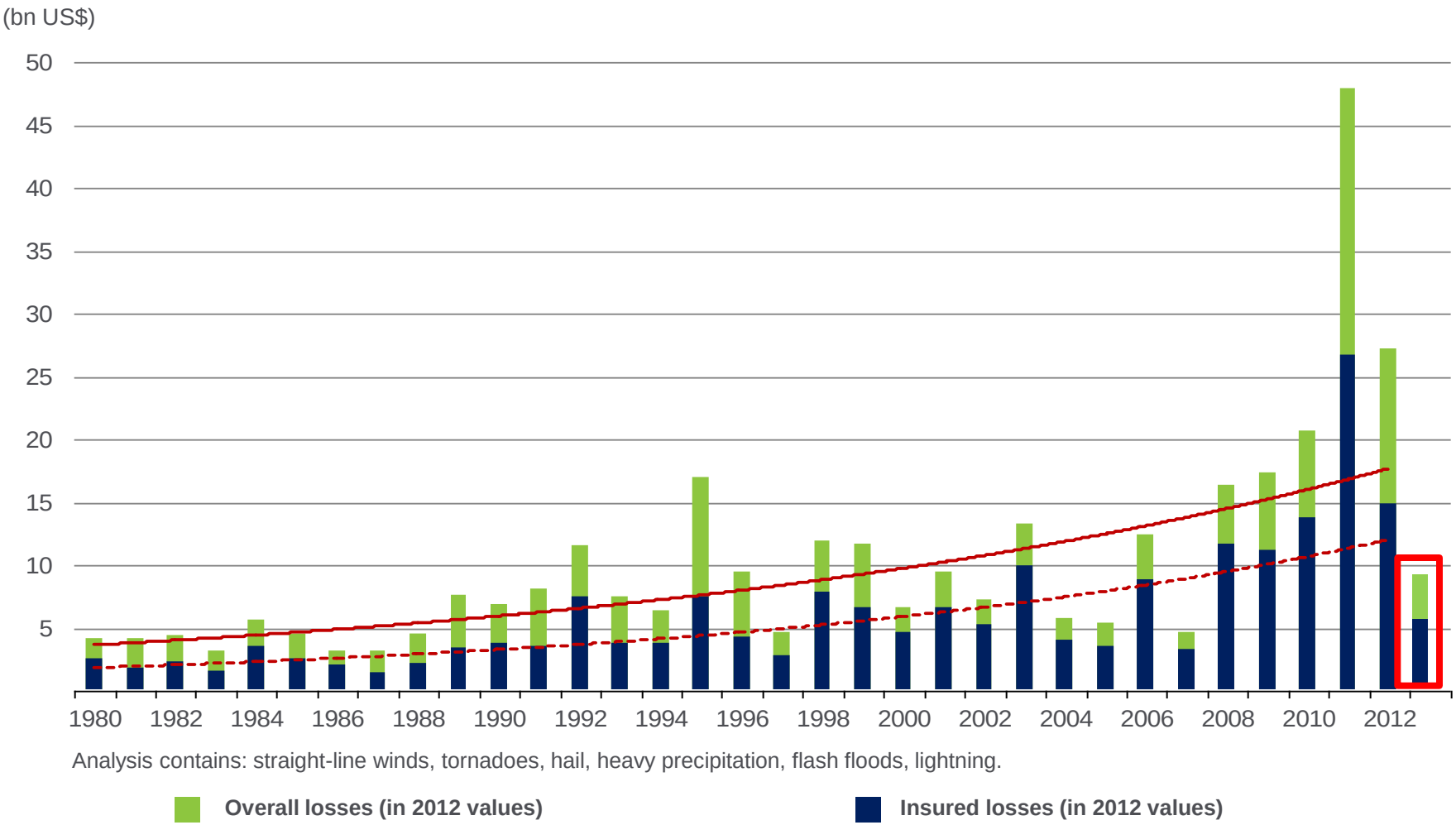
Number of events 1980 – 2012 and the half year 2013



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

Convective loss events in the U.S.

Overall and insured losses 1980 – 2012 and the half year 2013



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

New Munich Re/DLR scientific paper on U.S. Thunderstorm Trends

Munich RE

Weather, Climate and Society

Rising variability in thunderstorm-related U.S. losses as a reflection of changes in large-scale thunderstorm forcing

--Manuscript Draft--

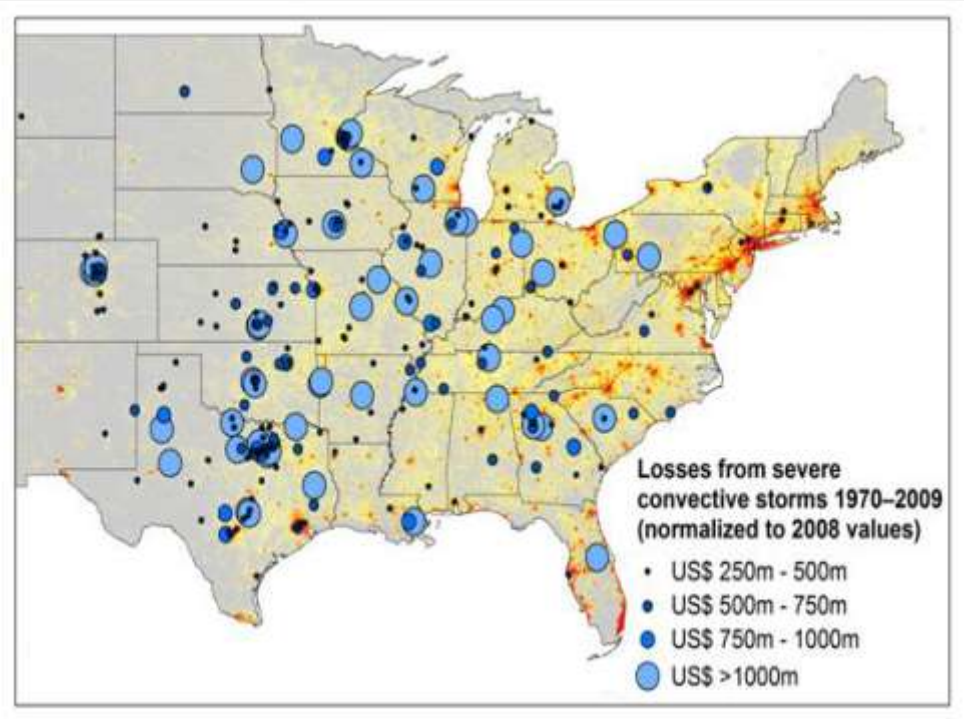
Manuscript Number:	WCAS-D-12-00023
Full Title:	Rising variability in thunderstorm-related U.S. losses as a reflection of changes in large-scale thunderstorm forcing
Article Type:	Article
Corresponding Author:	Eberhard Alfred Faust, Ph.D. Munich Reinsurance Company Munich, GERMANY
Corresponding Author's Institution:	Munich Reinsurance Company
First Author:	Julia Sander, Ph.D.
Order of Authors:	Julia Sander, Ph.D.
	Jan Falk Eichner, Ph.D.
	Eberhard Alfred Faust, Ph.D.
	Markus Steuer, M.Sc.

Published online on March 18, 2013

Major Results of New Munich Re Convective Storm Study

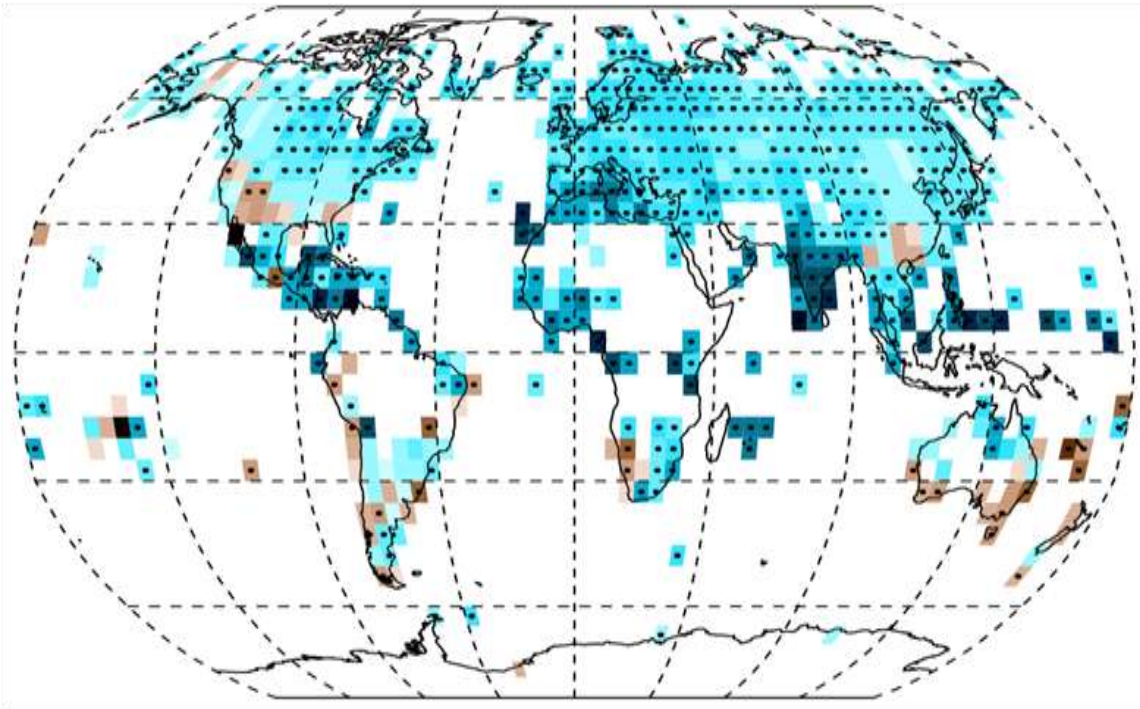
- Study examines convective (hail, tornado, thundersquall and heavy rainfall) events in the US with losses exceeding US$ 250m in the period 1970–2009 (80% of all losses)
- Past losses are normalized to currently exposed values
- After normalization there are still increases of losses
- Increases are correlated with the increase in the meteorological potential for severe thunderstorms and its variability

For the first time it could be shown that climatic changes have already influenced US thunderstorm losses!



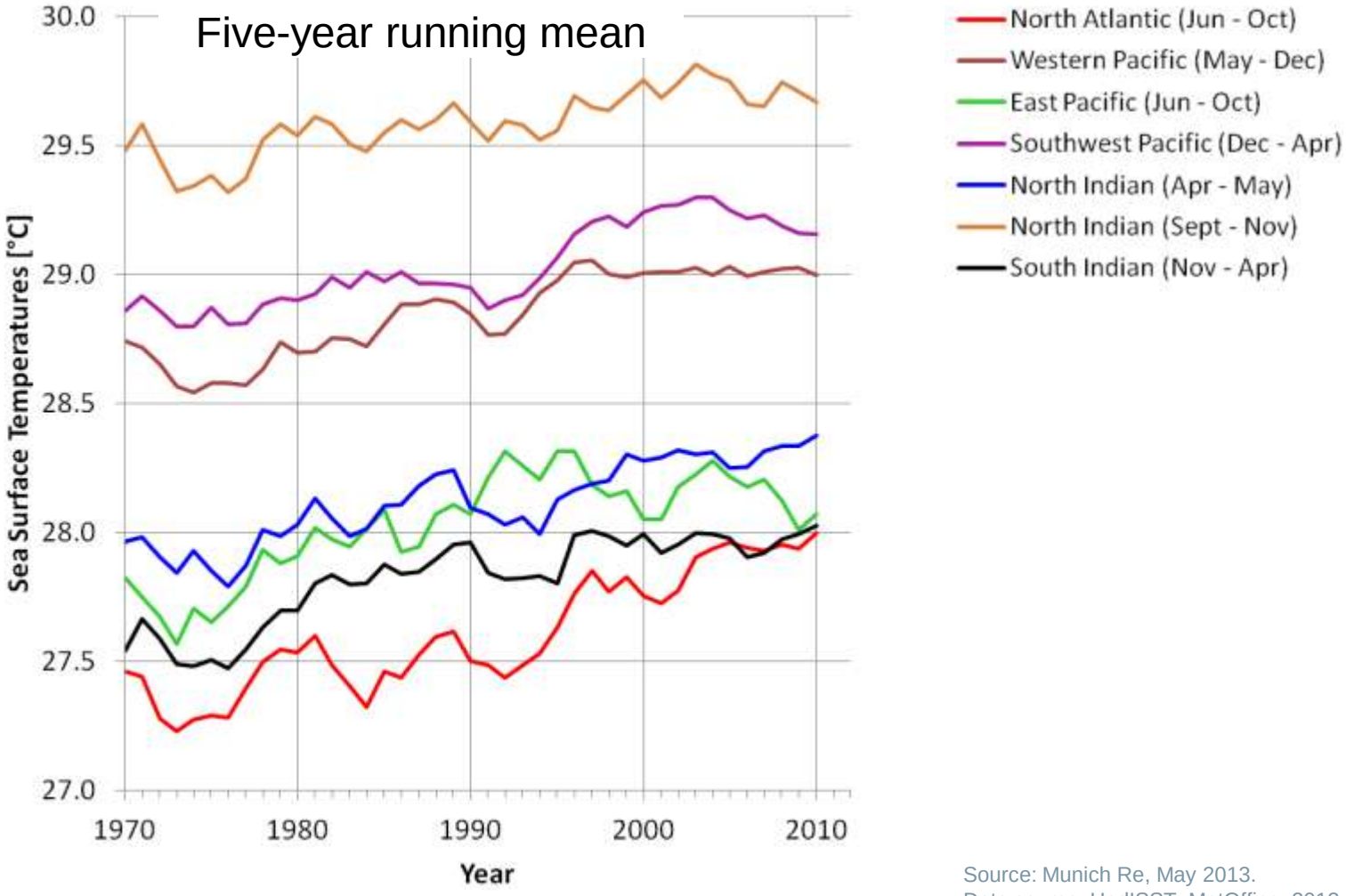
Specific humidity has risen in large parts of northern hemisphere

Change in near-surface specific humidity over time in the northern hemisphere 1973–2012 (Source: Willett et. al. (2013), Clim. Past, 9, 657–677.)
Black dots: trends significant at the 95% level



Climate model based studies: Increase has to be expected from anthropogenic climate change (Willet et al., 2010, Environ. Res. Letter, 5; Santer et al., 2007, PNAS, 104)

Observed changes in sea surface temperature in tropical ocean basins (1968-2012)

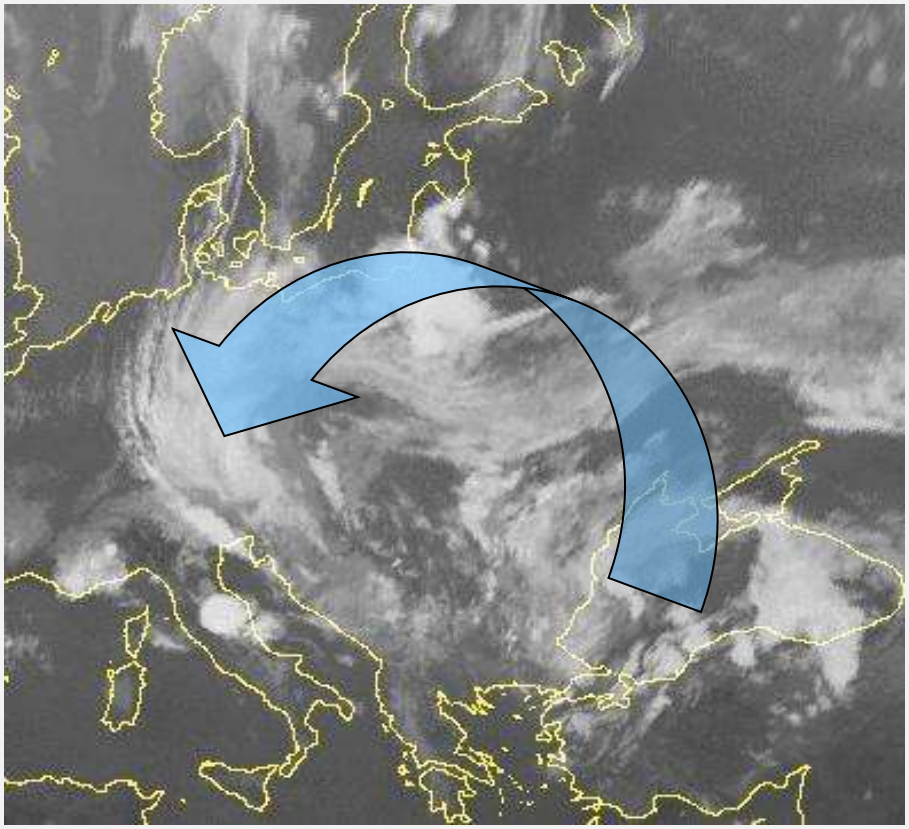


Source: Munich Re, May 2013.
Data source: HadISST, MetOffice, 2013

Munich RE

Floods

Floods in Europe in May/June 2013
Most probably the most expensive nat cat in Germany!

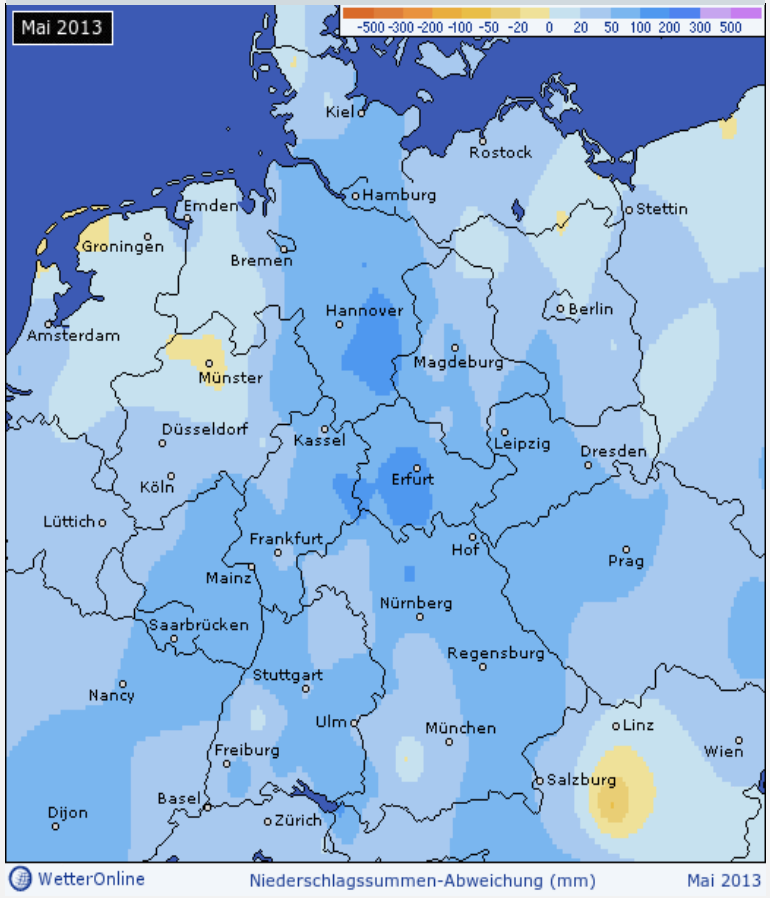


Region	Overall losses	Insured losses	Fatalities
Germany, Austria, Czech Republic	US$ > 16 bn*	US$ ~3.9 bn*	22

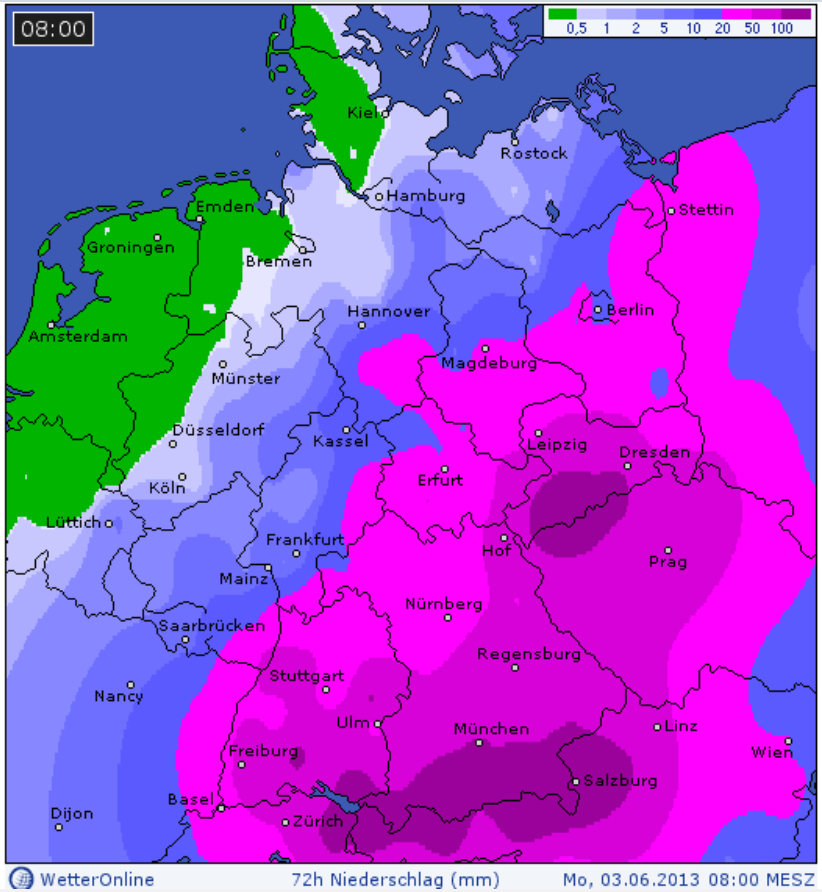
* Loss estimation still ongoing

Historical Precipitation and River Gauge Records

Precipitation anomalies in May 2013

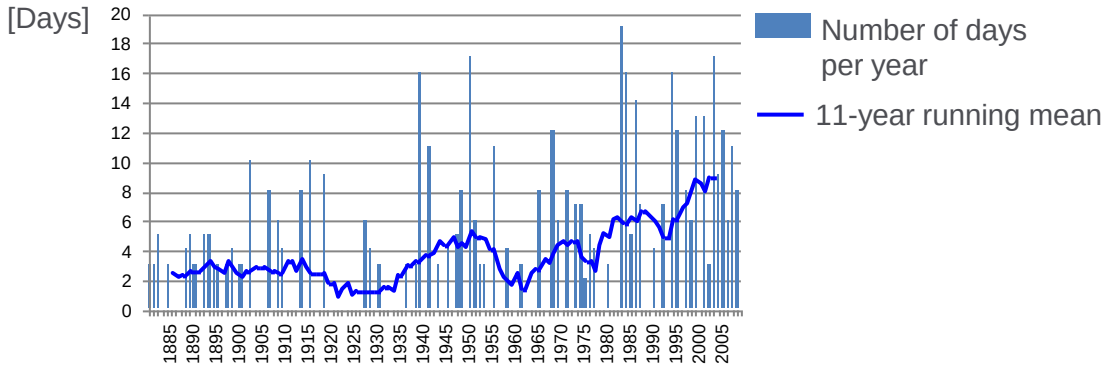


72 h precipitation sums June1-3, 2013



Weather pattern trough over central Europe

Weather pattern trough over central Europe in June - August



Duration of weather patterns (10-year running mean)

- The number of days with the weather pattern trough over central Europe has increased
  (see upper graph)
- One reason is that weather patterns in general move more slowly from west to east, leading to a longer persistence
  (see lower graph)
- Scientific findings indicate that climate change driven arctic warming is responsible for the reduced propagation
  (Francis and Vavrus 2012)

Data source: Katalog der Grosswetterlagen Europas (1881-2009). PIK Report No. 119.

Floods in Calgary Region (Alberta, Canada) June 20-23

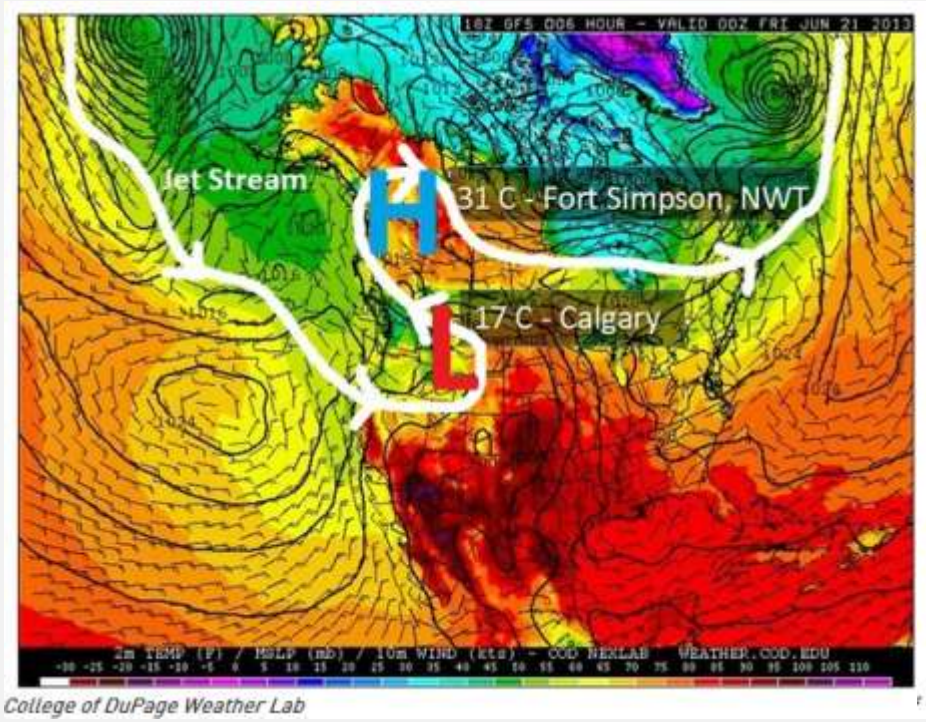
Worst flood in documented Canadian history

Region	Overall losses	Insured losses	Fatalities
Canada, Alberta	US$ >3.0bn*	US$ > 1.0bn*	3

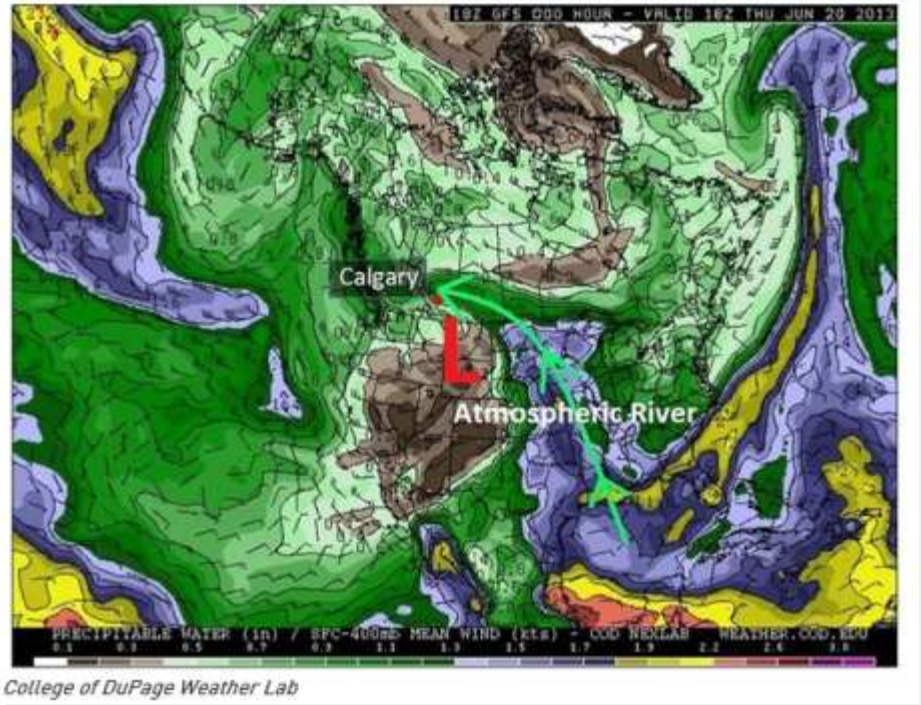
* Loss estimation still ongoing

Floods in Calgary Region (Alberta, Canada) June 20-23

Worst flood in Alberta in documented history!



College of DuPage Weather Lab



College of DuPage Weather Lab

A large ridge in the jet stream caused record warmth in Alaska and hot weather across parts of Canada's north and blocked a strong dip in the jet stream from moving quickly from west to east.

Source: http://www.theweathernetwork.com/news/articles/alberta-floods-why-is-there-so-much-rain/8124/

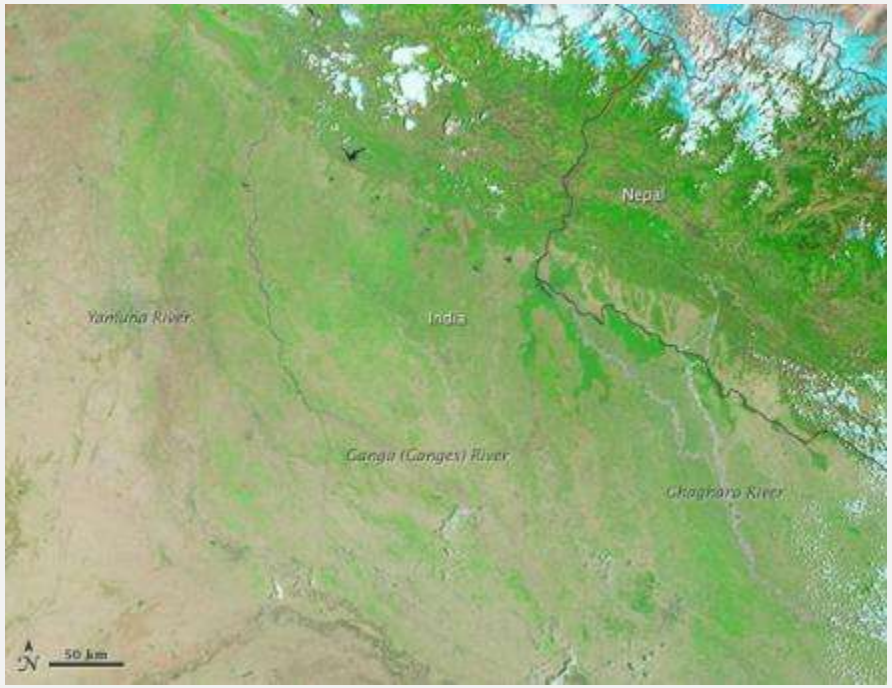
Evidence linking Arctic amplification to extreme weather in mid-latitudes

Jennifer A. Francis[1] and Stephen J. Vavrus[2], 2012

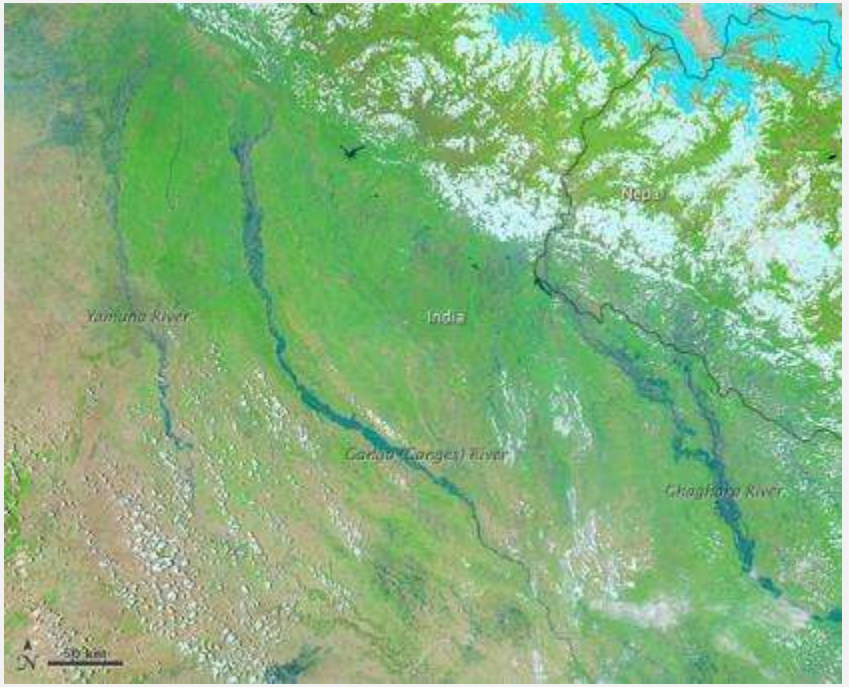
Munich RE

[1] Arctic amplification (AA) – the observed enhanced warming in high northern latitudes relative to the northern hemisphere – is evident in lower-tropospheric temperatures and in 1000-to-500 hPa thicknesses. Daily fields of 500 hPa heights from the National Centers for Environmental Prediction Reanalysis are analyzed over N. America and the N. Atlantic to assess changes in north-south (Rossby) wave characteristics associated with AA and the relaxation of poleward thickness gradients. Two effects are identified that each contribute to a slower eastward progression of Rossby waves in the upper-level flow: 1) weakened zonal winds, and 2) increased wave amplitude. These effects are particularly evident in autumn and winter consistent with sea-ice loss, but are also apparent in summer, possibly related to earlier snow melt on high-latitude land. Slower progression of upper-level waves would cause associated weather patterns in mid-latitudes to be more persistent, which may lead to an increased probability of extreme weather events that result from prolonged conditions, such as drought, flooding, cold spells, and heat waves. **Citation:** Francis, J. A., and S. J. Vavrus (2012), Evidence linking Arctic amplification to extreme weather in mid-latitudes, *Geophys. Res. Lett.*, *39*, L06801,

Floods in India June 2013
The deadliest natural catastrophe of first half of 2013!



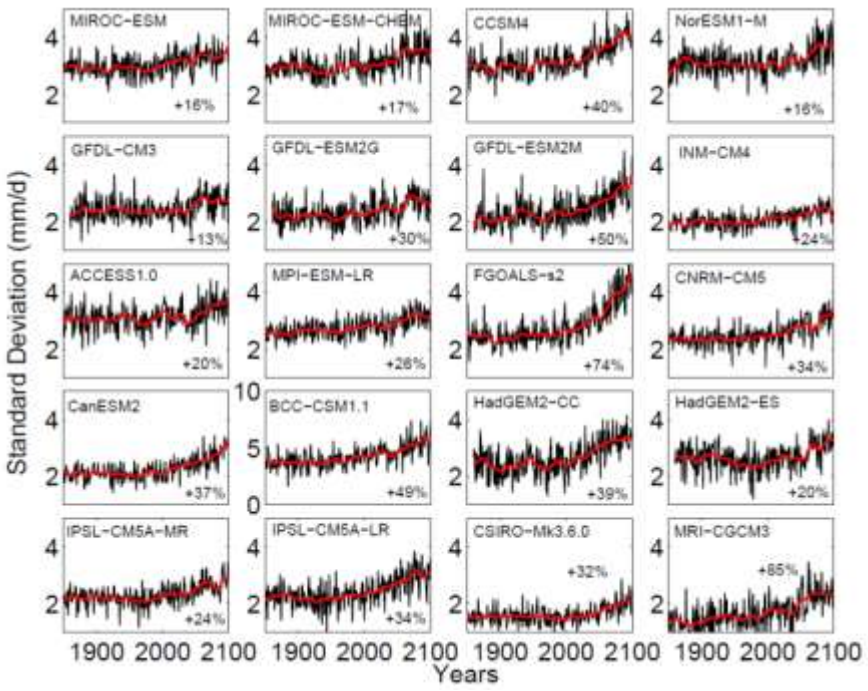
Source: NASA



Source: NASA

Region	Overall losses	Insured losses	Fatalities
India, Uttarakhand	Loss estimation in progress	Loss estimation in progress	1,056

Enhanced future variability during India's rainy season
New climate model simulations



Time series of intra seasonal standard deviation of all India summer monsoon rainfall (June-Sept.) for the strongest future warming scenario (RCP-8.5)

Ensemble climate model simulations (for IPCC AR-5) projects significant increases from pre-industrial climate to 2100 in day-to-day rainfall variability

- in all the 20 models (see graphic)
- and under all four future warming scenarios

(Representative Concentration Pathways RCP -2.6/-4.5/-6.0/-8.5)

Menon A., et al. (2013): Enhanced future variability during India's rainy season. Geophys. Res. Lett.

Study shows causal associations between climate change and weather extremes

Published online 16 February 2011 | *Nature* **470**, 316 (2011) | doi:10.1038/470316a

News

Increased flood risk linked to global warming

Likelihood of extreme rainfall may have been doubled by rising greenhouse-gas levels.

Quirin Schiermeier

The effects of severe weather — such as these floods in Albania — take a huge human and financial toll. *REUTERS/A. CELI*

Climate change may be hitting home. Rises in global average temperature are remote from most people's experience, but two studies in this week's *Nature*[1,2] conclude that climate warming is already causing extreme weather events that affect the lives of millions. The research directly links rising greenhouse-gas levels with the growing intensity of rain and snow in the Northern Hemisphere, and the increased risk of flooding in the United Kingdom.

Human contribution to more-intense precipitation extremes

Seung-Ki Min, Xuebin Zhang, Francis W. Zwiers & Gabriele C. Hegerl

Affiliations | Contributions | Corresponding authors

Nature **470**, 378–381 (17 February 2011) | doi:10.1038/nature09763
Received 15 March 2010 | Accepted 17 December 2010 | Published online 16 February 2011

"… Here we show that human-induced increases in greenhouse gases have contributed to the observed intensification of heavy precipitation events found over approximately two-thirds of data-covered parts of Northern Hemisphere land areas. ..Changes in extreme precipitation projected by models and thus the impacts of future changes in extreme precipitation, may be underestimated because models seem to underestimate the observed increase in heavy precipitation with warming".

INSURANCE INFORMATION INSTITUTE

Market & Financial Impact of Catastrophe Loss:
First Half 2013

Insurance Information Institute

July 9, 2013

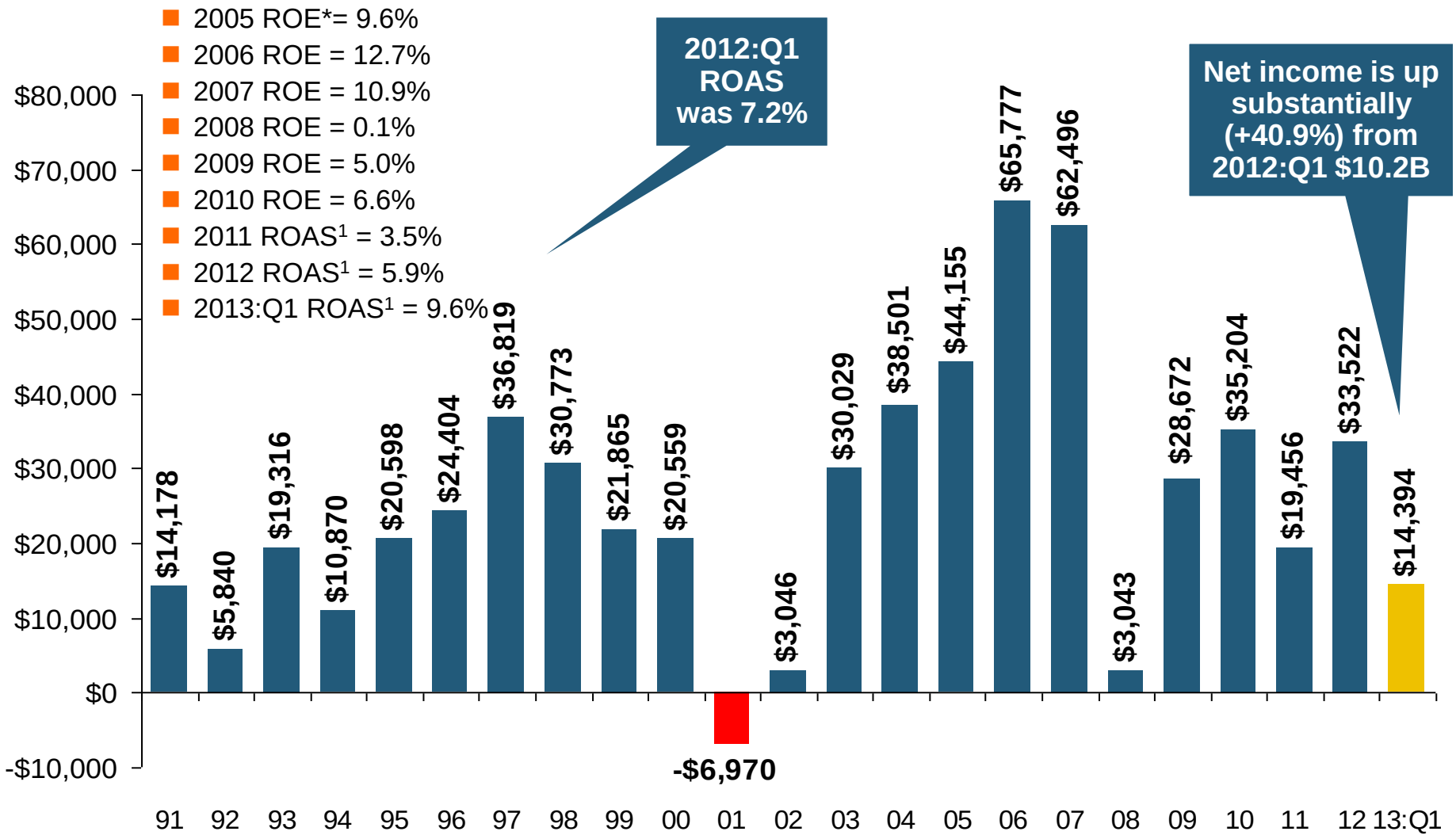
Robert P. Hartwig, Ph.D., CPCU, President & Economist
Insurance Information Institute ♦ 110 William Street ♦ New York, NY 10038
Tel: 212.346.5520 ♦ Cell: 917.453.1885 ♦ bobh@iii.org ♦ www.iii.org

INSURANCE INFORMATION INSTITUTE

P/C Insurance Industry Financial Overview

Industry's Financial Strength and Overall Performance Improved During the First Half of 2013 in Part Due to Lower Catastrophe Losses

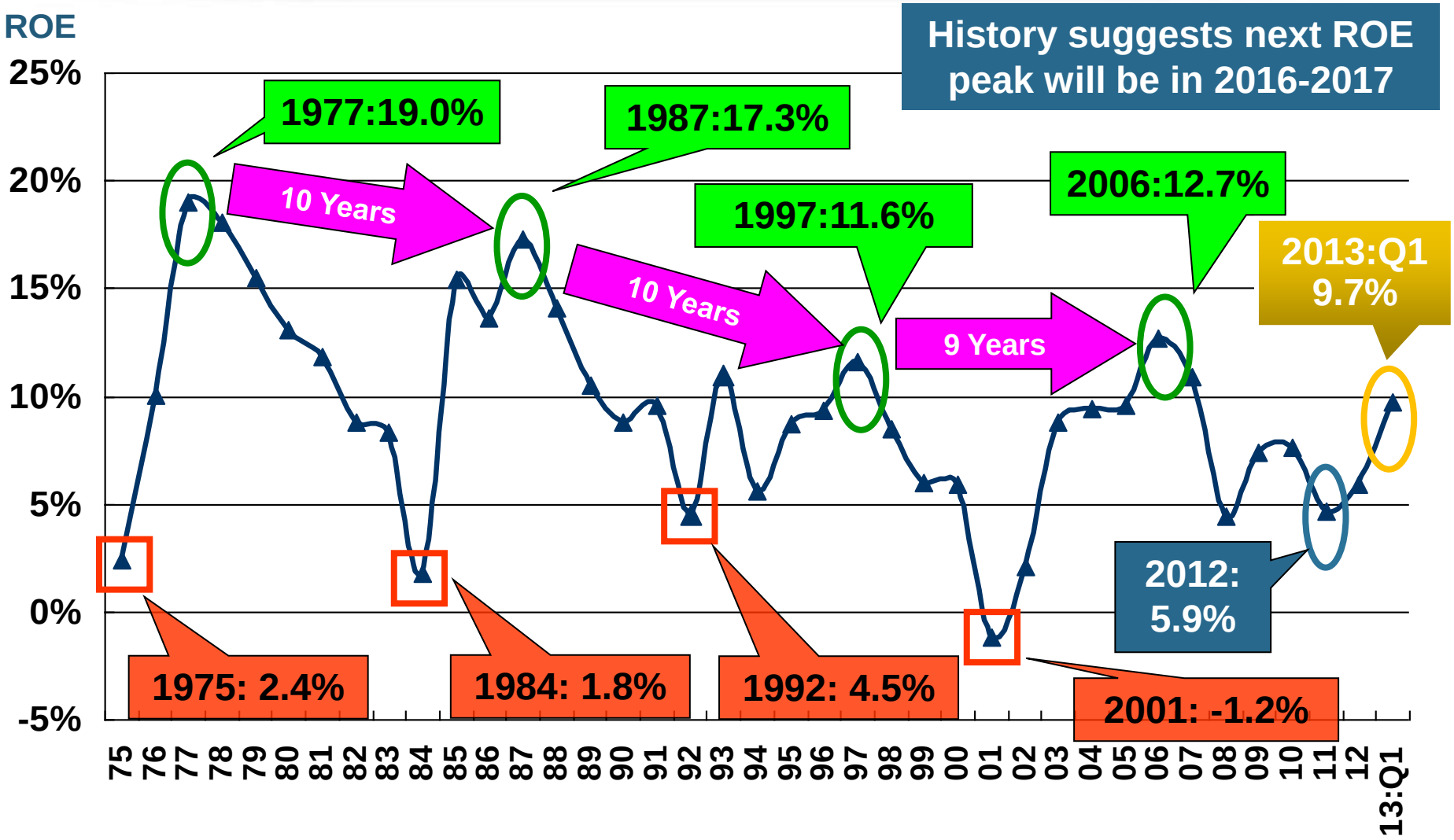
P/C Net Income After Taxes 1991–2013:Q1 ($ Millions)



•ROE figures are GAAP; [1]Return on avg. surplus. Excluding Mortgage & Financial Guaranty insurers yields a 9.7% ROAS in 2013:Q1, 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

Profitability Peaks & Troughs in the P/C Insurance Industry, 1975 – 2013:Q1*



*Profitability = P/C insurer ROEs. 2011-13 figures are estimates based on ROAS data. Note: Data for 2008-2013 exclude mortgage and financial guaranty insurers.

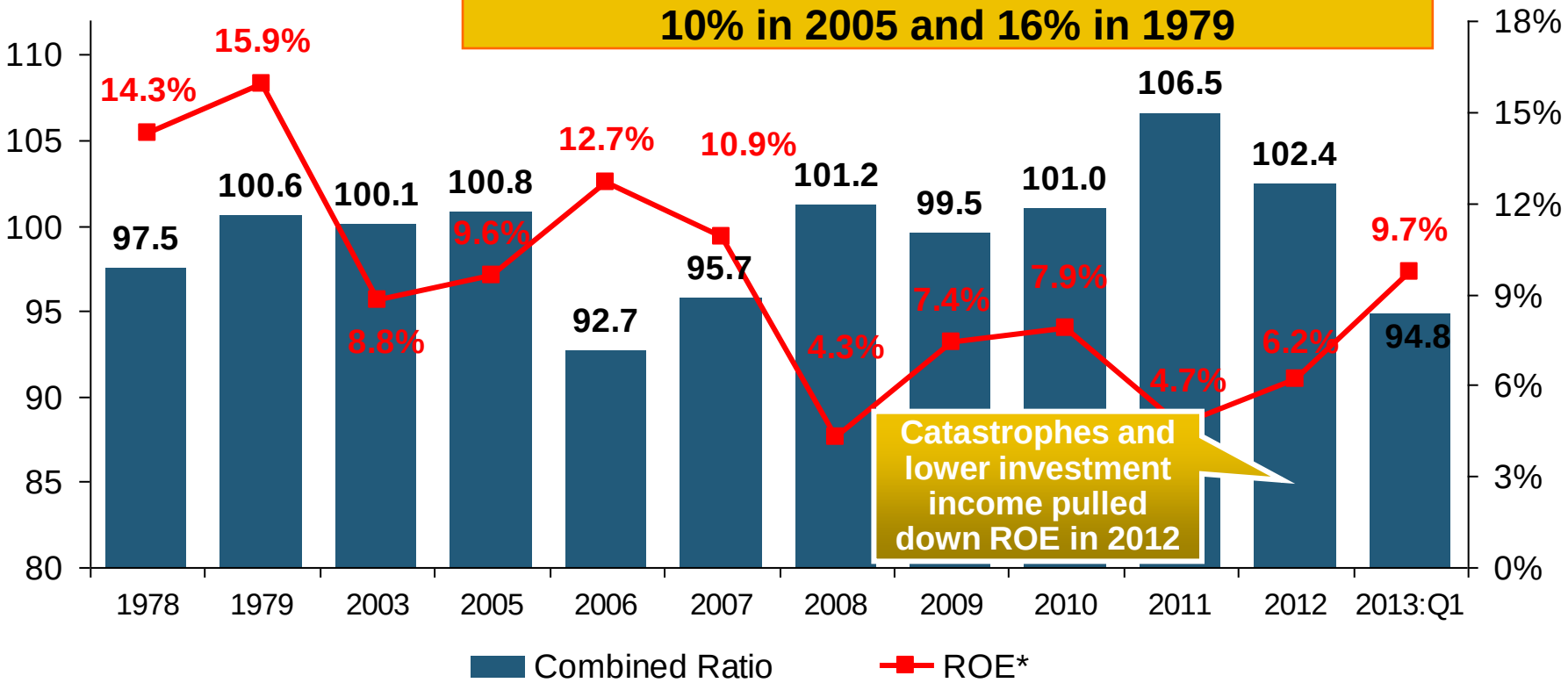
Source: Insurance Information Institute; NAIC, ISO, A.M. Best.

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

INSURANCE INFORMATION INSTITUTE

Combined Ratio / ROE

A combined ratio of about 100 generates an ROE of ~7.0% 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 combined ratio including M&FG insurers is 103.2, 2011 combined ratio including M&FG insurers is 108.1, ROAS = 3.5%.

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

INSURANCE INFORMATION INSTITUTE

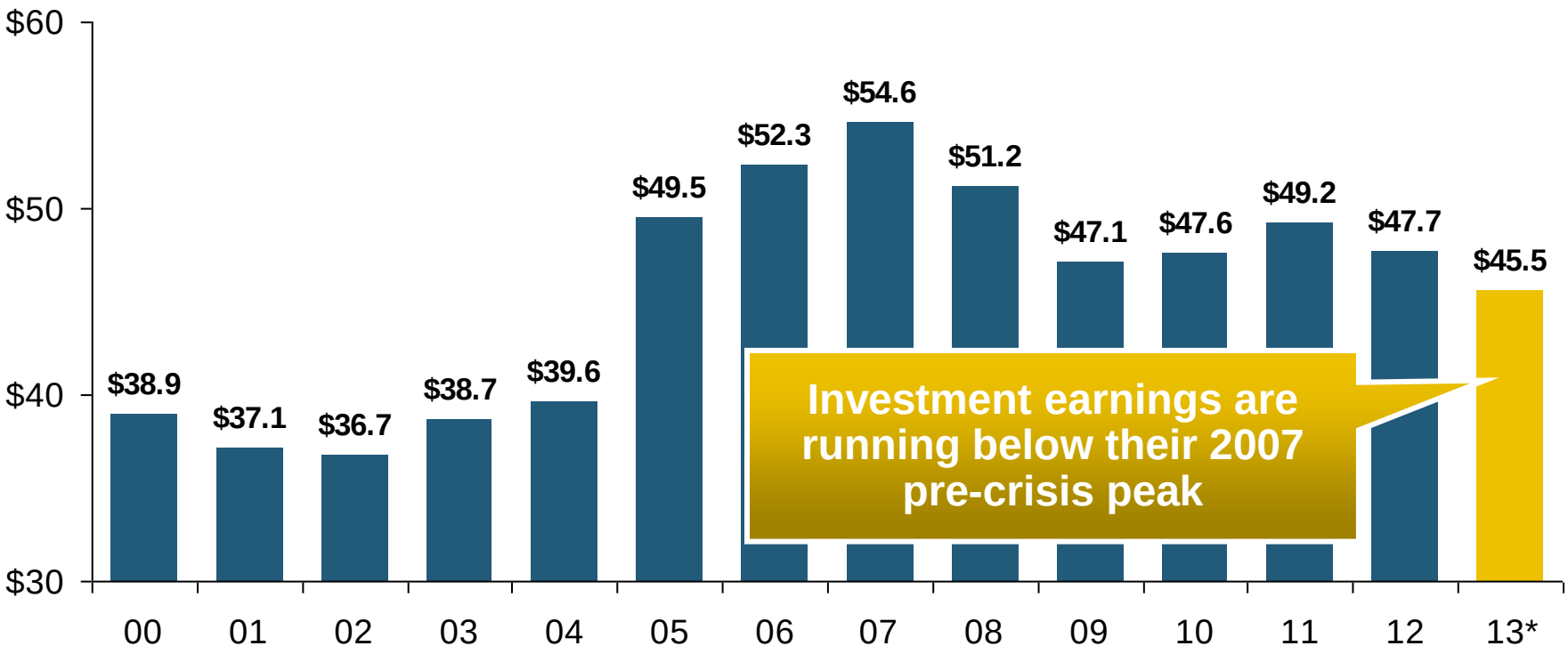
INVESTMENTS: THE NEW REALITY

Depressed Yields Will Necessarily Influence Underwriting & Pricing

Property/Casualty Insurance Industry Investment Income: 2000–2013*[1]

INSURANCE INFORMATION INSTITUTE

($ Billions)



Investment Income Fell in 2012 and is Falling in 2013 Due to Persistently Low Interest Rates, Putting Additional Pressure on (Re) Insurance Pricing

[1] Investment gains consist primarily of interest and stock dividends..
*Estimate based on annualized actual Q1:2013 investment income of $11.385B.
Sources: ISO; Insurance Information Institute.

INSURANCE INFORMATION INSTITUTE

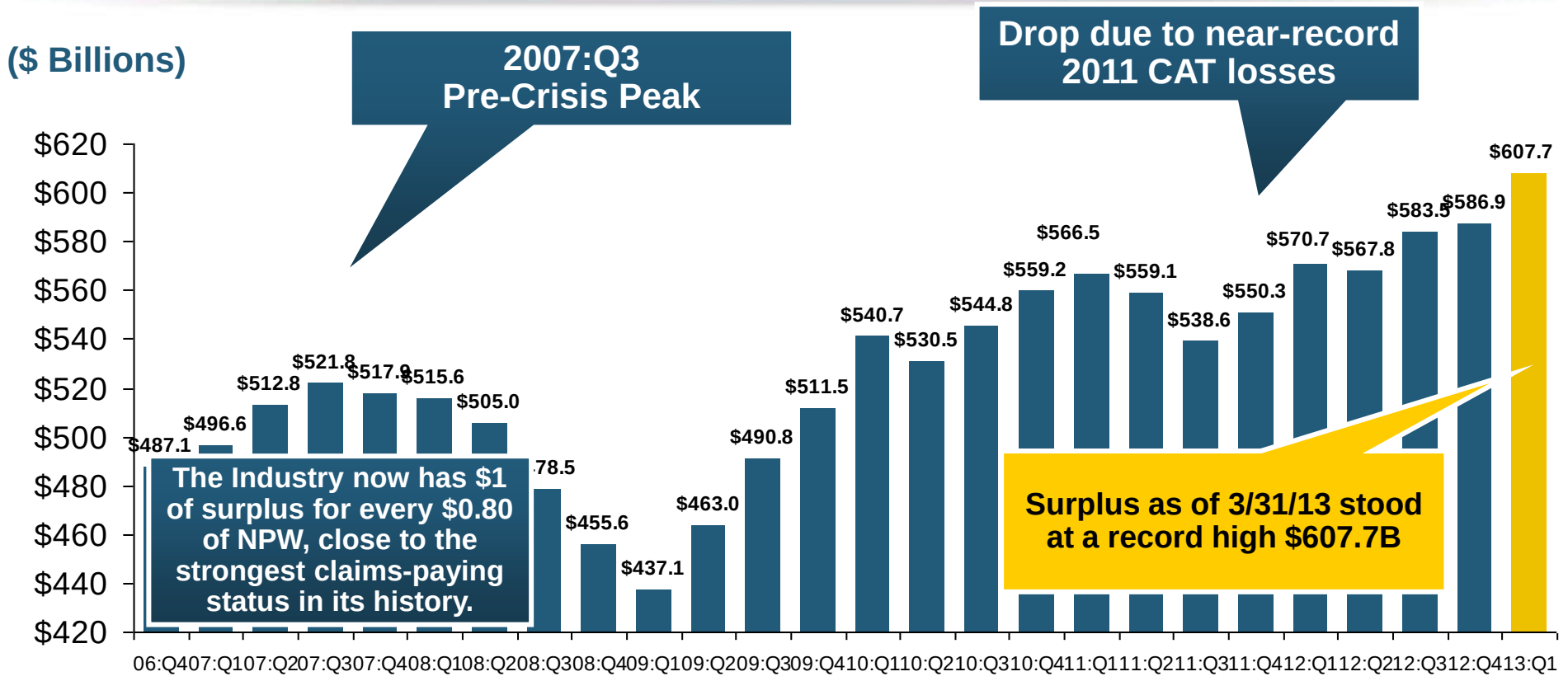
SURPLUS/CAPITAL/CAPACITY

Industry Claims Paying Capital Stands at or Near Record High as of Mid-2013;

Strength Despite Large Catastrophe Losses in 2011-2012, Including Sandy

Policyholder Surplus, 2006:Q4–2013:Q1

INSURANCE INFORMATION INSTITUTE



*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.

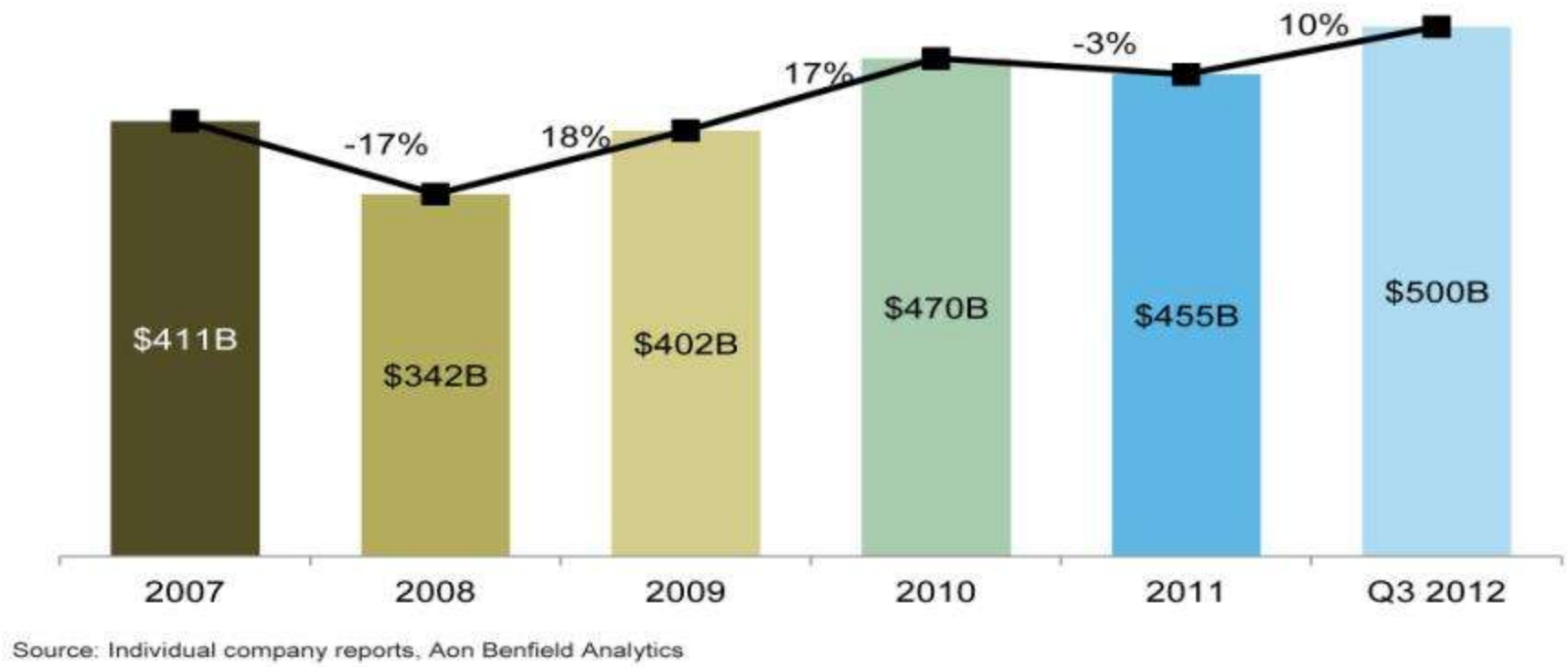
The P/C Insurance Industry Both Entered and Emerged from the 2012 Hurricane Season Very Strong Financially.

Sources: ISO, A.M .Best.

Reinsurance Capital Is at a Record High

INSURANCE INFORMATION INSTITUTE

Change in Global Reinsurer Capital



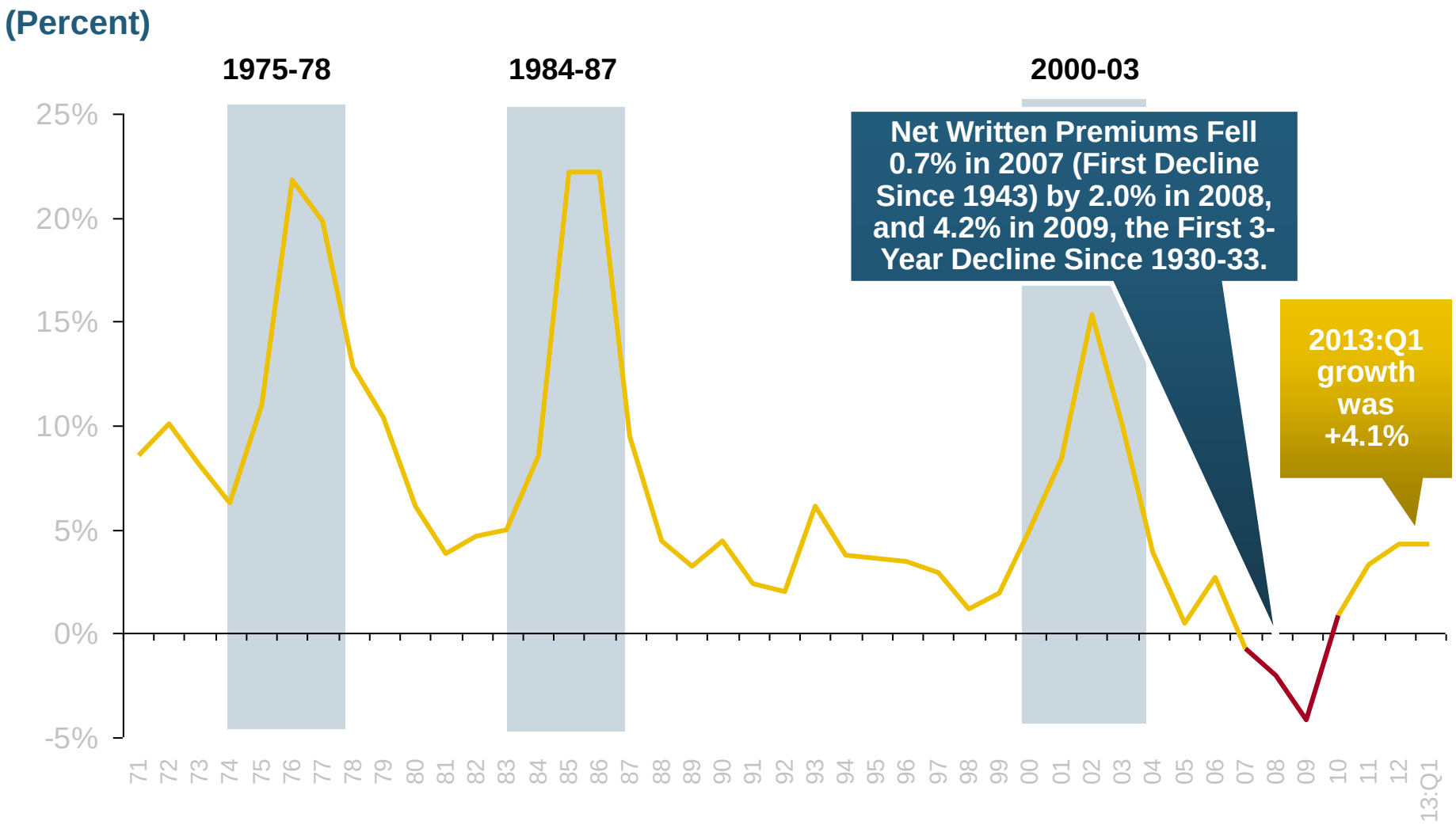
Source: Reinsurance Association of America from company reports and Aon Benfield Analytics.

INSURANCE INFORMATION INSTITUTE

Premium Growth

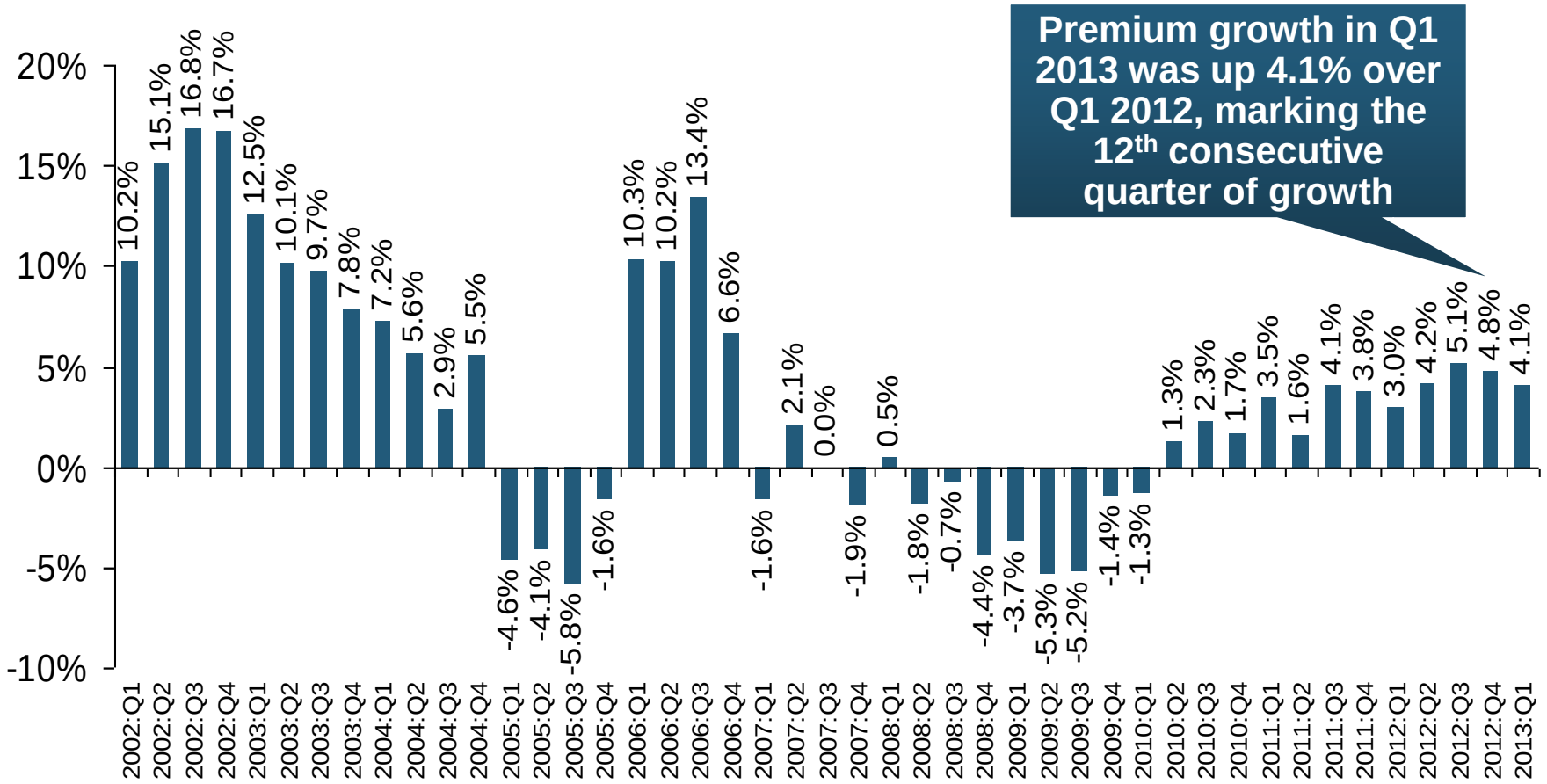
Catastrophe Losses Impact Trajectory of Premium Growth

Net Premium Growth: Annual Change, 1971—2013:Q1



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

P/C Net Premiums Written: % Change, Quarter vs. Year-Prior Quarter



Sustained Growth in Written Premiums (vs. the same quarter, prior year) Will Continue through 2013

Sources: ISO, Insurance Information Institute.

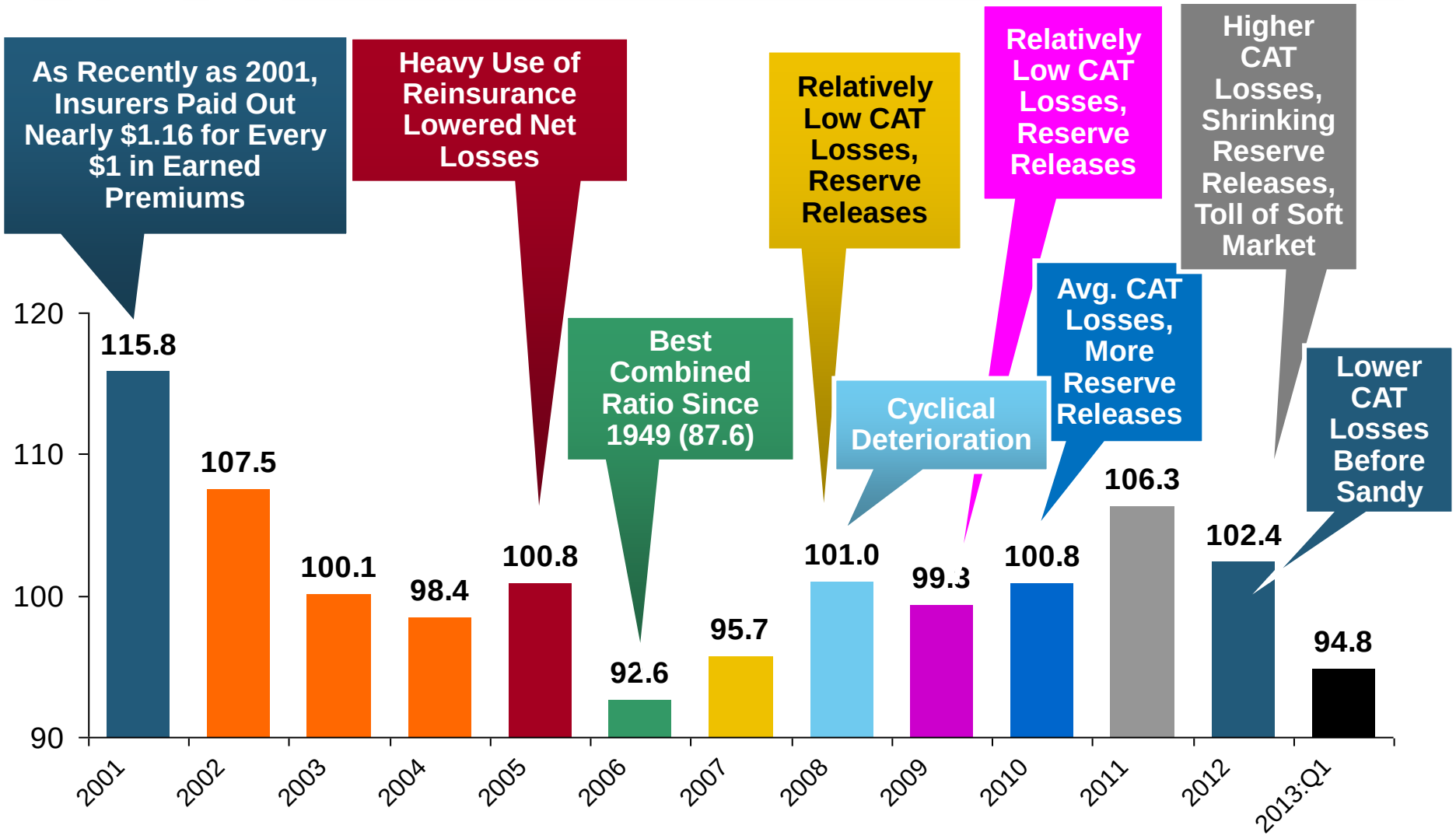
INSURANCE INFORMATION INSTITUTE

UNDERWRITING

Underwriting Losses in 2012 and 2011 Were Impacted by High Catastrophe Losses

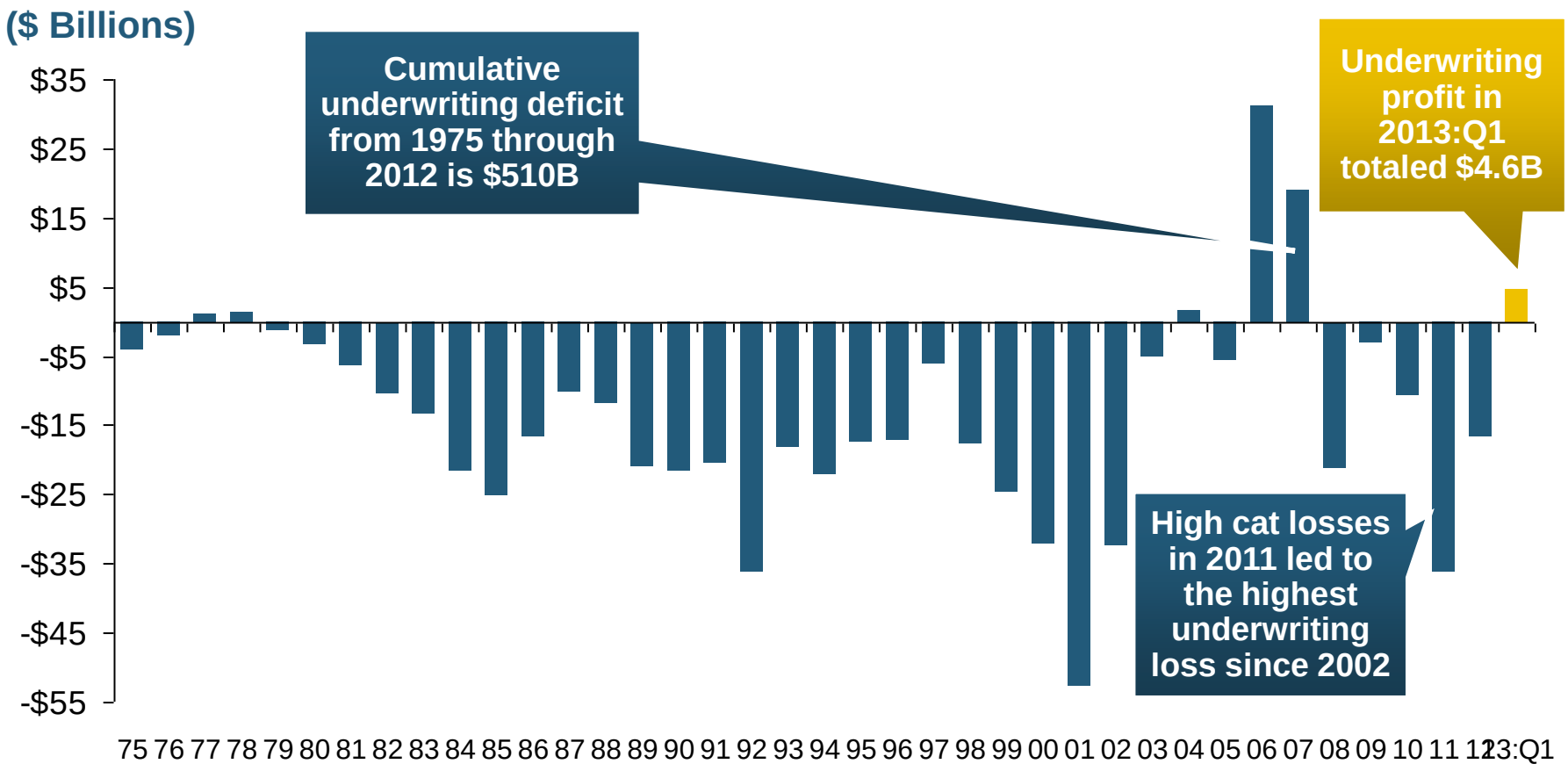
Too Soon to Tell for 2013; Historically Q3 Has the Highest Losses for the US

P/C Insurance Industry Combined Ratio, 2001–2013:Q1*



* Excludes Mortgage & Financial Guaranty insurers 2008--2012. Including M&FG, 2008=105.1, 2009=100.7, 2010=102.4, 2011=108.1; 2012:=103.2.
Sources: A.M. Best, ISO.

Underwriting Gain (Loss) 1975–2013:Q1*

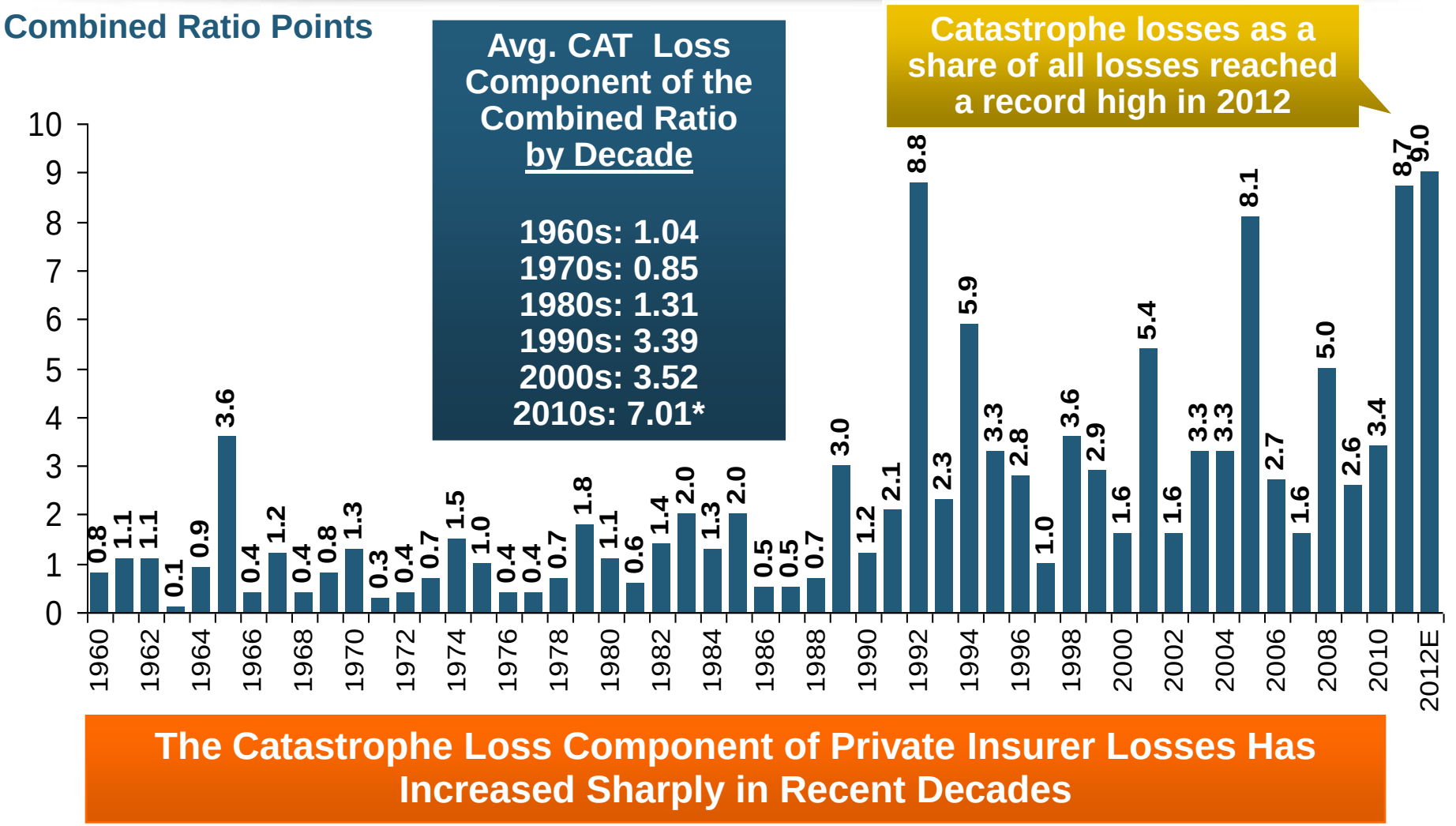


Large Underwriting Losses Are *NOT* Sustainable in Current Investment Environment

* Includes mortgage and financial guaranty insurers in all years.

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

Combined Ratio Points Associated with Catastrophe Losses: 1960 – 2012*



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

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.

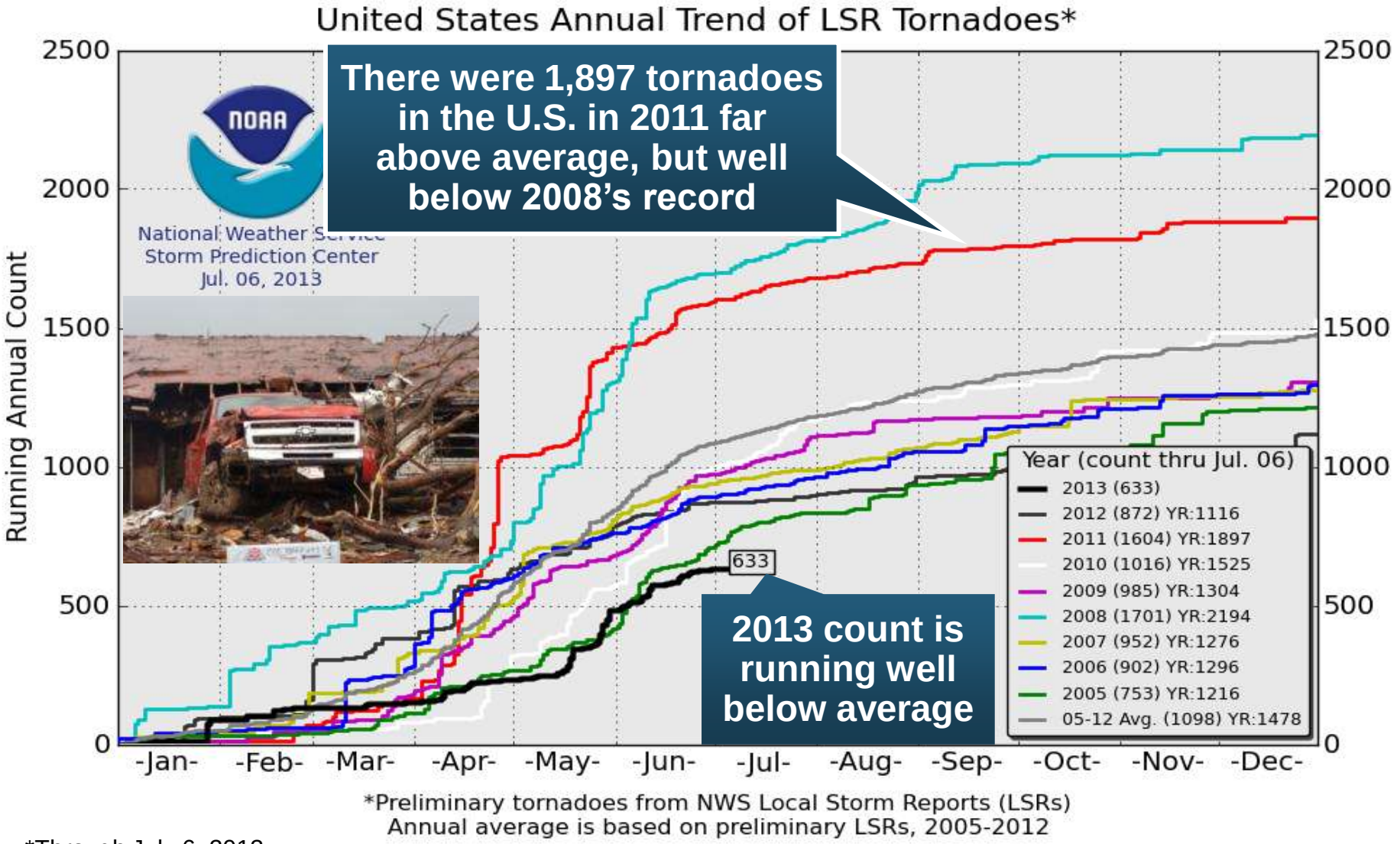
Source: ISO (1960-2011); A.M. Best (2012E) Insurance Information Institute.

INSURANCE INFORMATION INSTITUTE

Severe Weather Events: First Half 2013

Natural Catastrophe Activity Has Down from Elevated Levels of First Half 2011-2012

U.S. Tornado Count, 2005-2013*



*Through July 6, 2013.

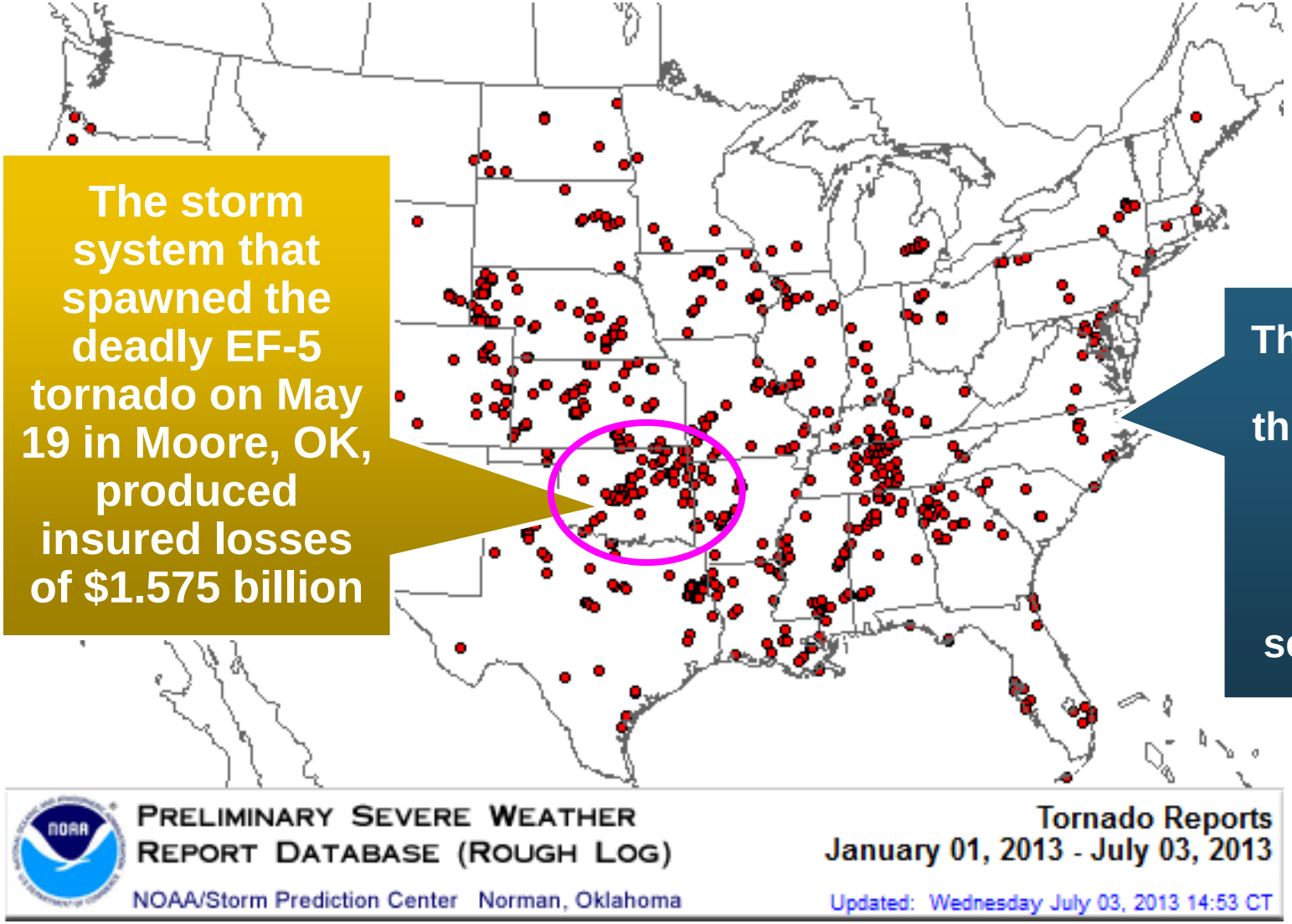
Source: http://www.spc.noaa.gov/wcm/.

Location of Tornado Reports: Through July 3, 2013

INSURANCE INFORMATION INSTITUTE

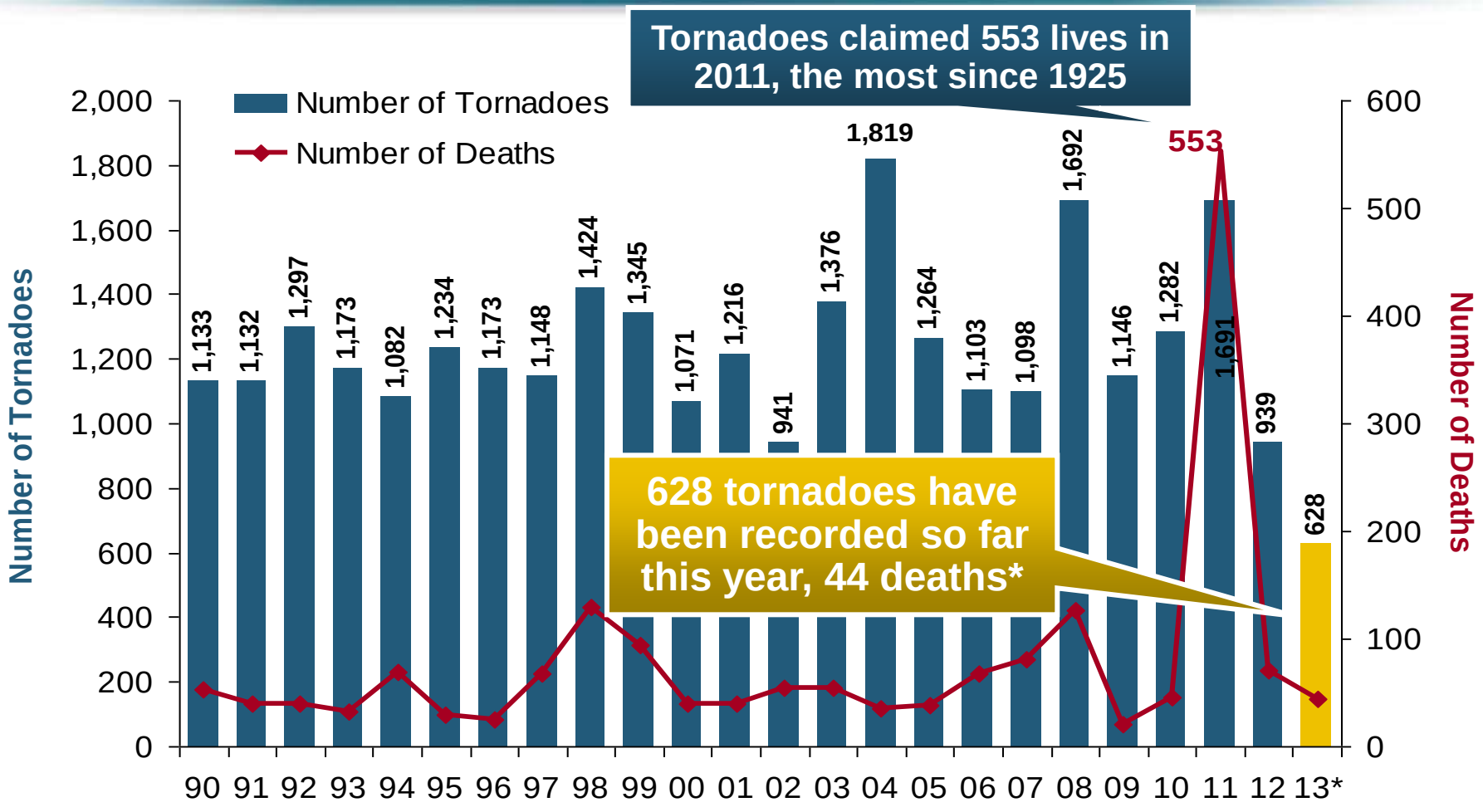
The storm system that spawned the deadly EF-5 tornado on May 19 in Moore, OK, produced insured losses of $1.575 billion

There were 630 tornadoes through July 3, causing extensive property damage in several states



Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2013_annual_summary.html#; PCS.

Number of Tornadoes and Related Deaths, 1990 – 2013*

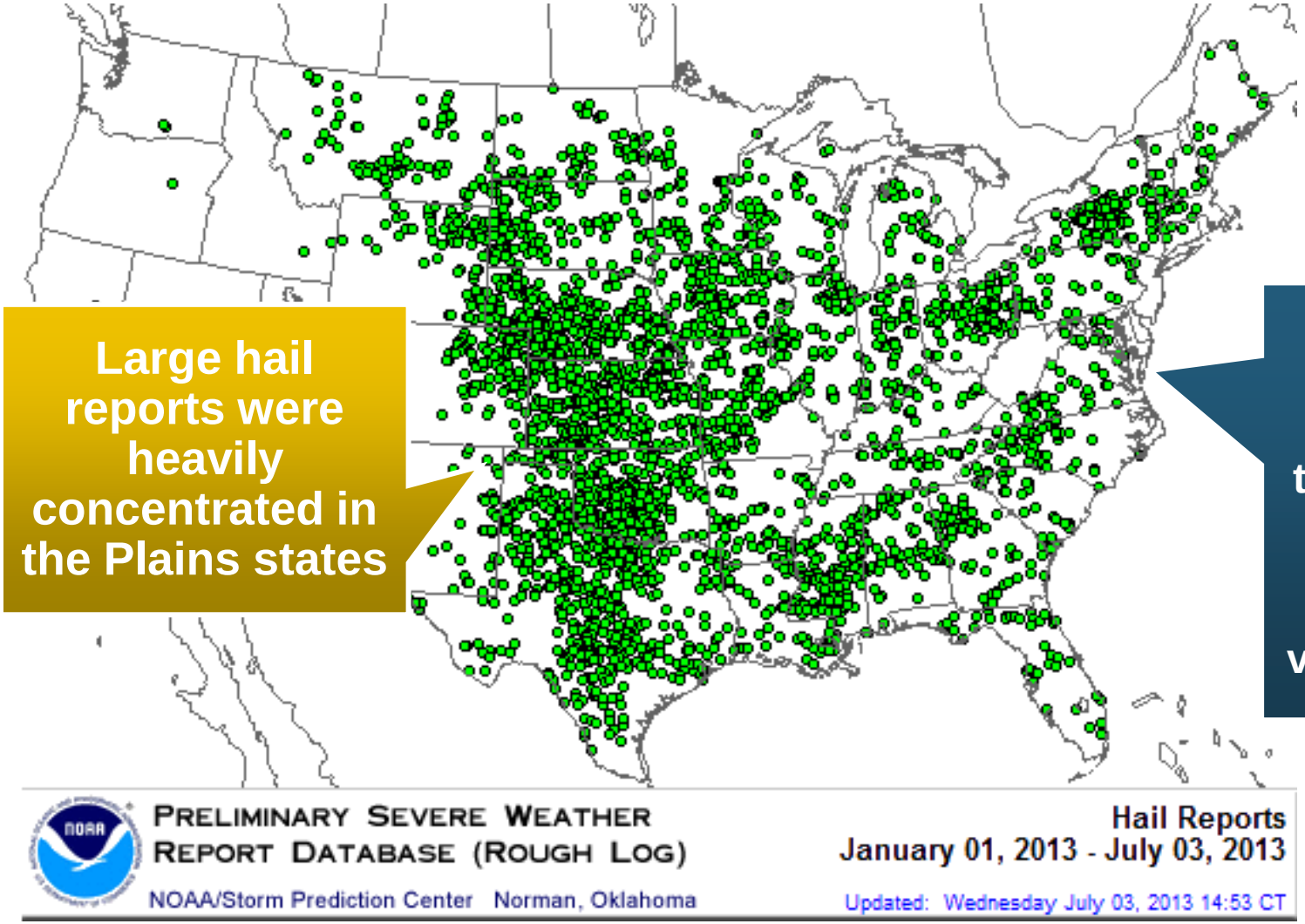


Insured Losses from Tornadoes and Thunderstorms in the First Half of Produced Insured Losses of Approximately $6B.

*Through July 3, 2013.

Source: U.S. Department of Commerce, Storm Prediction Center, National Weather Service at http://www.spc.noaa.gov/climo/online/monthly/newm.html

Location of Large Hail Reports: Through July 3, 2013



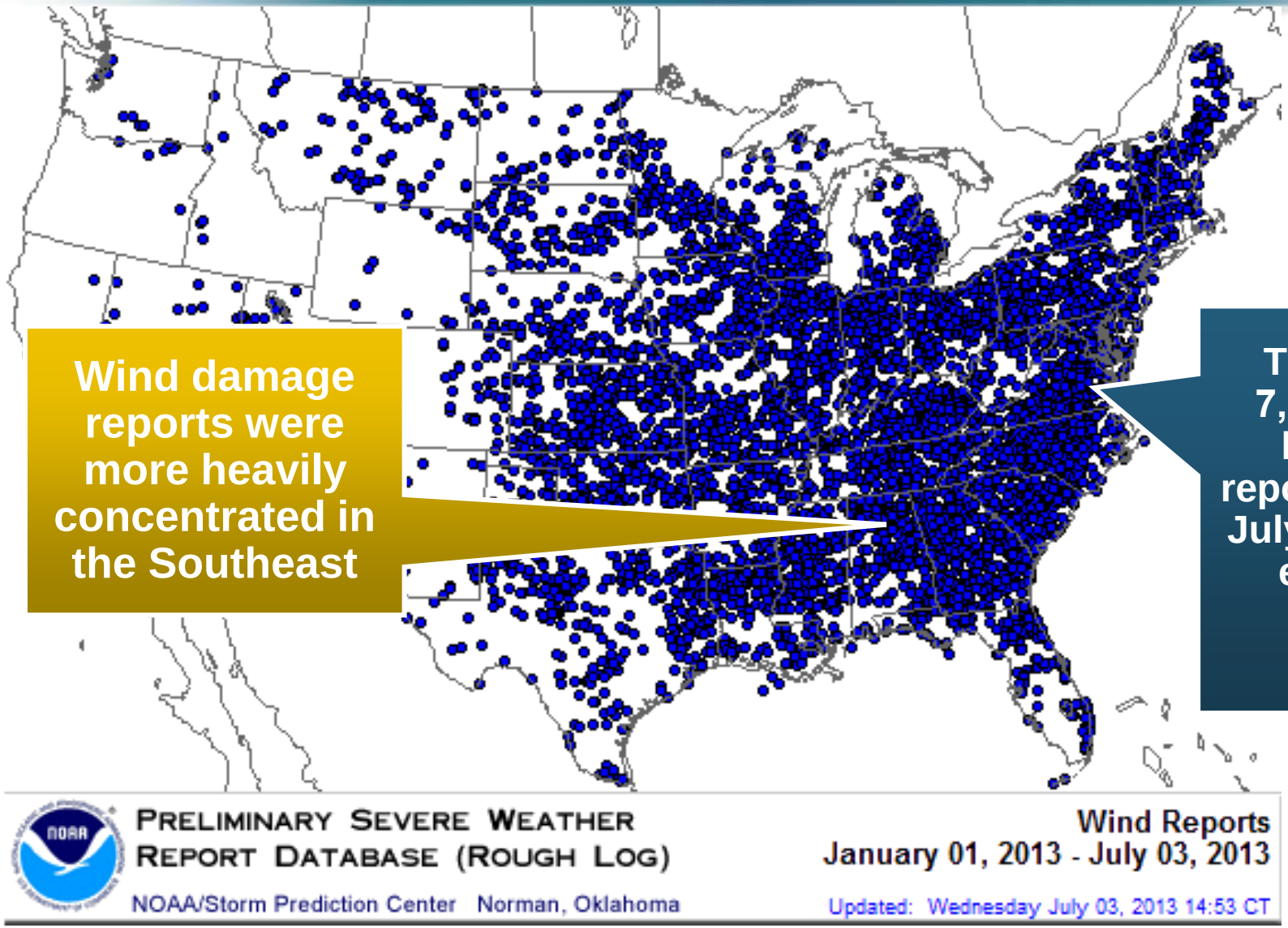
Large hail reports were heavily concentrated in the Plains states

There were 3,716 "Large Hail" reports through July 3, causing extensive property and vehicle damage

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2013_annual_summary.html#

Location of High Wind Reports: Through July 3, 2013

INSURANCE INFORMATION INSTITUTE



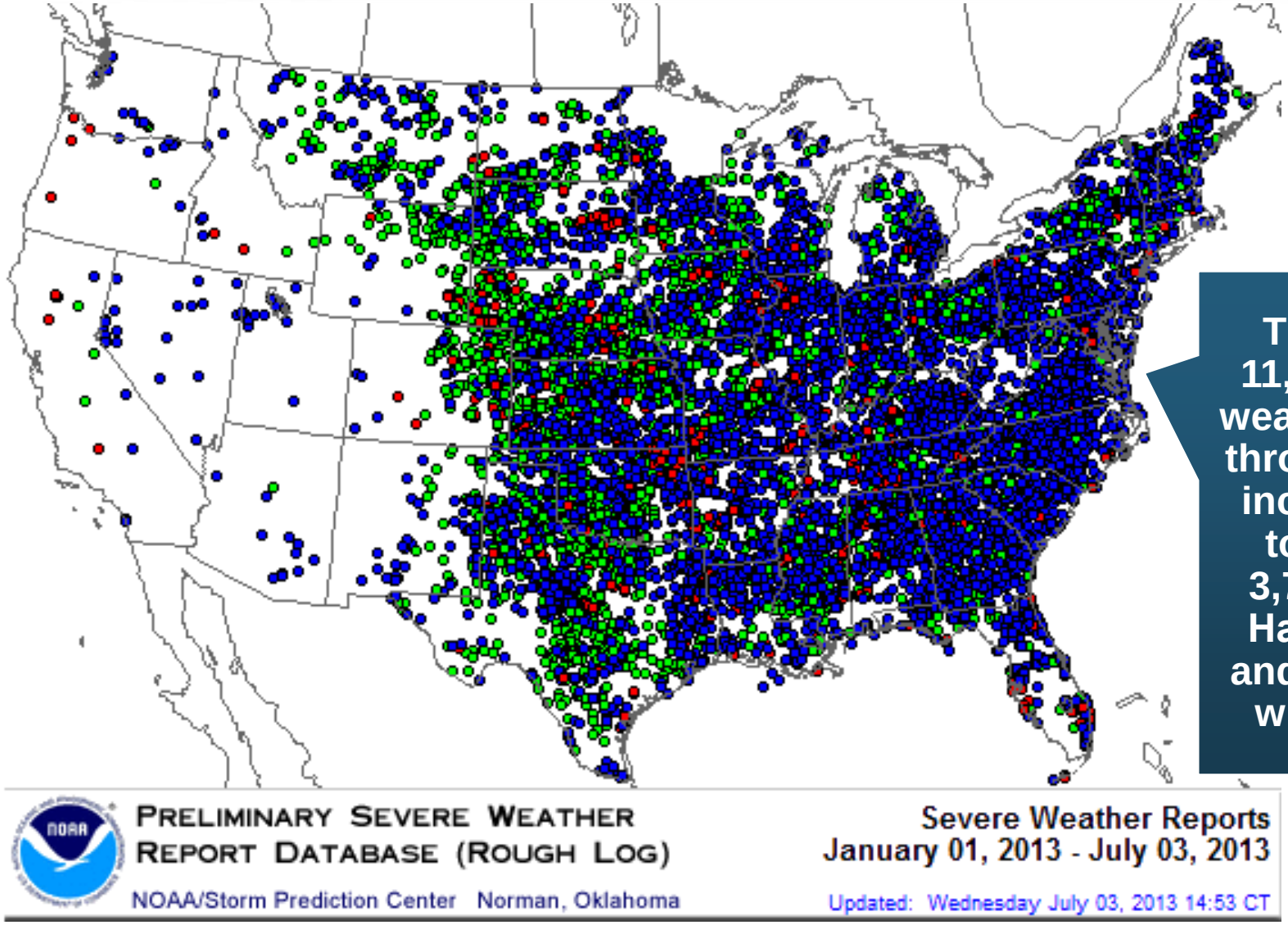
Wind damage reports were more heavily concentrated in the Southeast

There were 7,371 "Wind Damage" reports through July 3, causing extensive property damage

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2013_annual_summary.html#

Severe Weather Reports: Through July 3, 2013

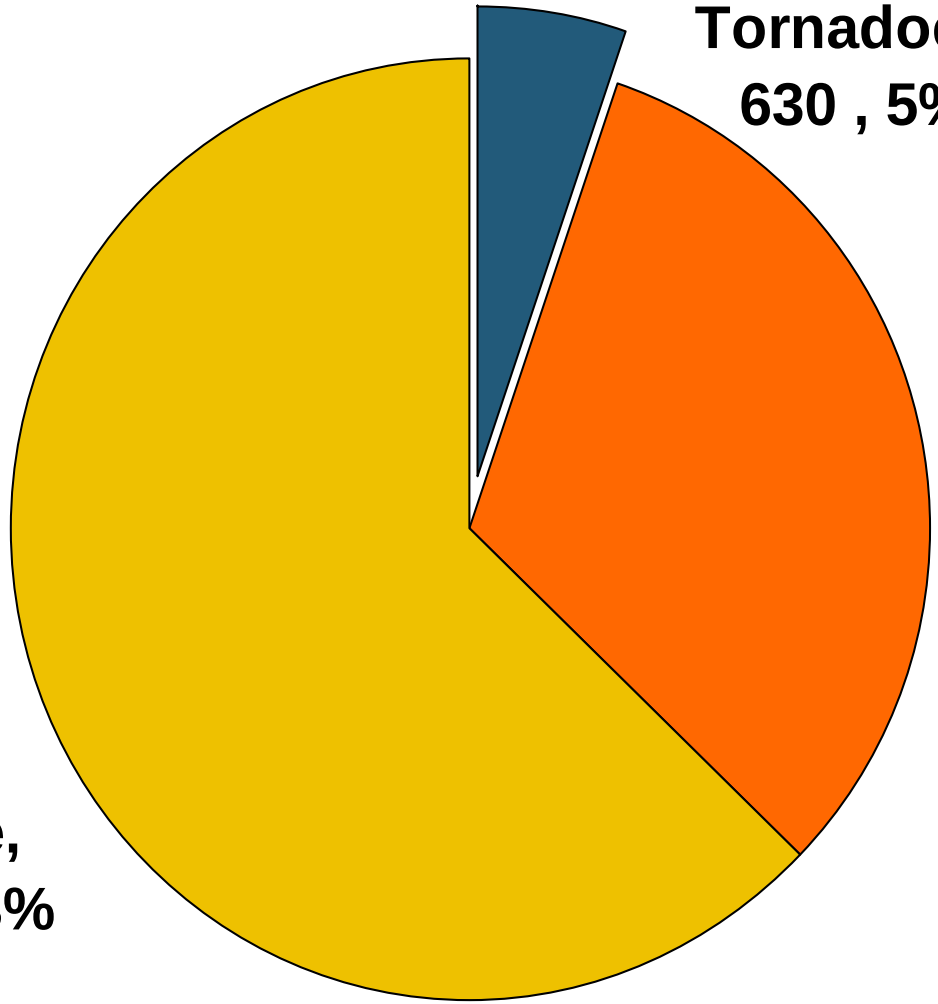
INSURANCE INFORMATION INSTITUTE



There were 11,717 severe weather reports through July 3; including 630 tornadoes; 3,716 "Large Hail" reports and 7,371 high wind events

Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2013_annual_summary.html#

Number of Severe Weather Reports in US, by Type, 2013*



Tornadoes accounted for just 5% of all Severe Weather Reports so far in 2013. Tornado and Hail reports are running below average while Wind reports are close to average

*As of July 3, 2013
Source: NOAA Storm Prediction Center; http://www.spc.noaa.gov/climo/online/monthly/2013_annual_summary.html#

INSURANCE INFORMATION INSTITUTE

OUTLOOK FOR 2013 HURRICANE SEASON: ABOVE AVERAGE ACTIVITY EXPECTED

Hurricanes and Tropical Storms Frequently Drive Some of the Largest Losses Each Year as with Sandy in 2012

Outlook for 2013 Hurricane Season: 75% Worse Than Average

Forecast Parameter	Median (1981-2010)	2013F
Named Storms	12.0	18
Named Storm Days	60.1	95
Hurricanes	6.5	9
Hurricane Days	21.3	40
Major Hurricanes	2.0	4
Major Hurricane Days	3.9	9
Accumulated Cyclone Energy	92.0	165
Net Tropical Cyclone Activity	103%	**175%**

Source: Philip Klotzbach and Dr. William Gray, Colorado State University, June 2013, accessed at http://tropical.atmos.colostate.edu/forecasts/2013/jun2013/jun2013.pdf ; Insurance Information Institute..

Landfall Probabilities for 2013 Hurricane Season: Above Average

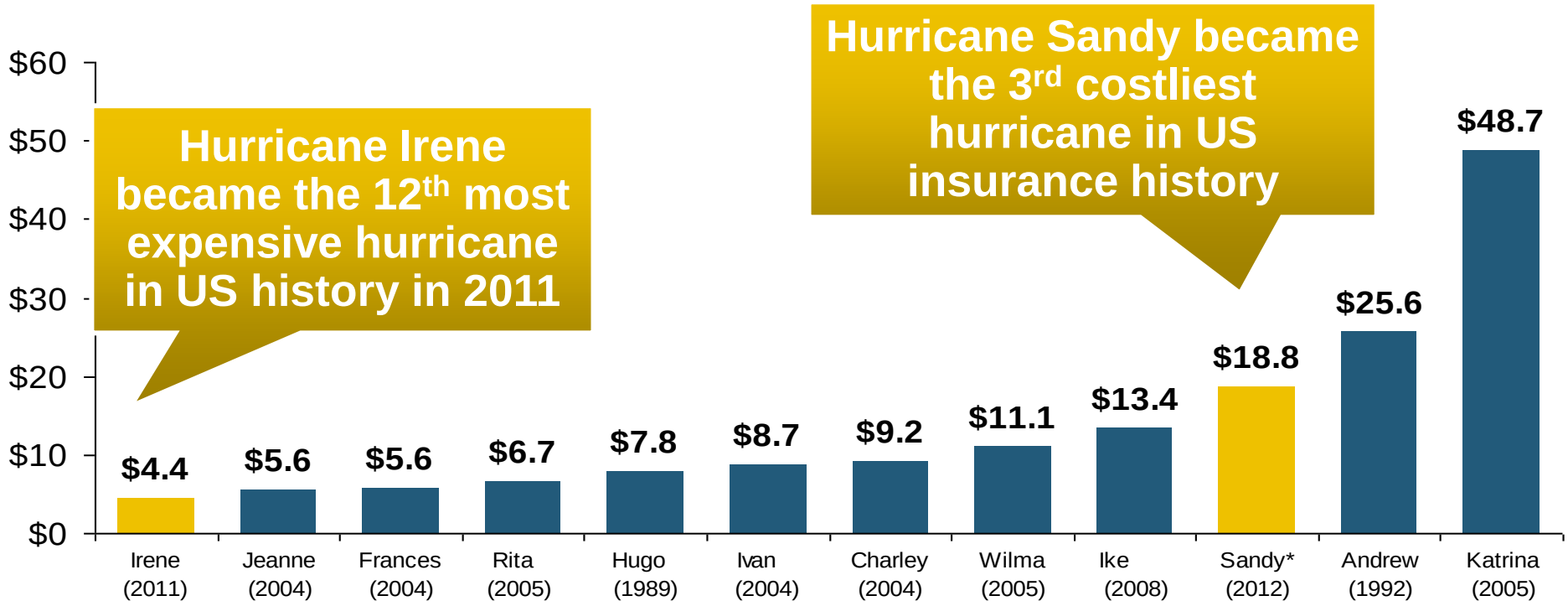
	Average*	2013F
Entire US East & Gulf Coasts	52%	72%
US East Coast Including Florida Peninsula	31%	48%
Gulf Coast from Florida Panhandle to Brownsville	30%	47%
Caribbean	42%	61%

*Average over the past century.
Source: Philip Klotzbach and Dr. William Gray, Colorado State University, June 2013.

Top 12 Most Costly Hurricanes in U.S. History

(Insured Losses, 2012 Dollars, $ Billions)

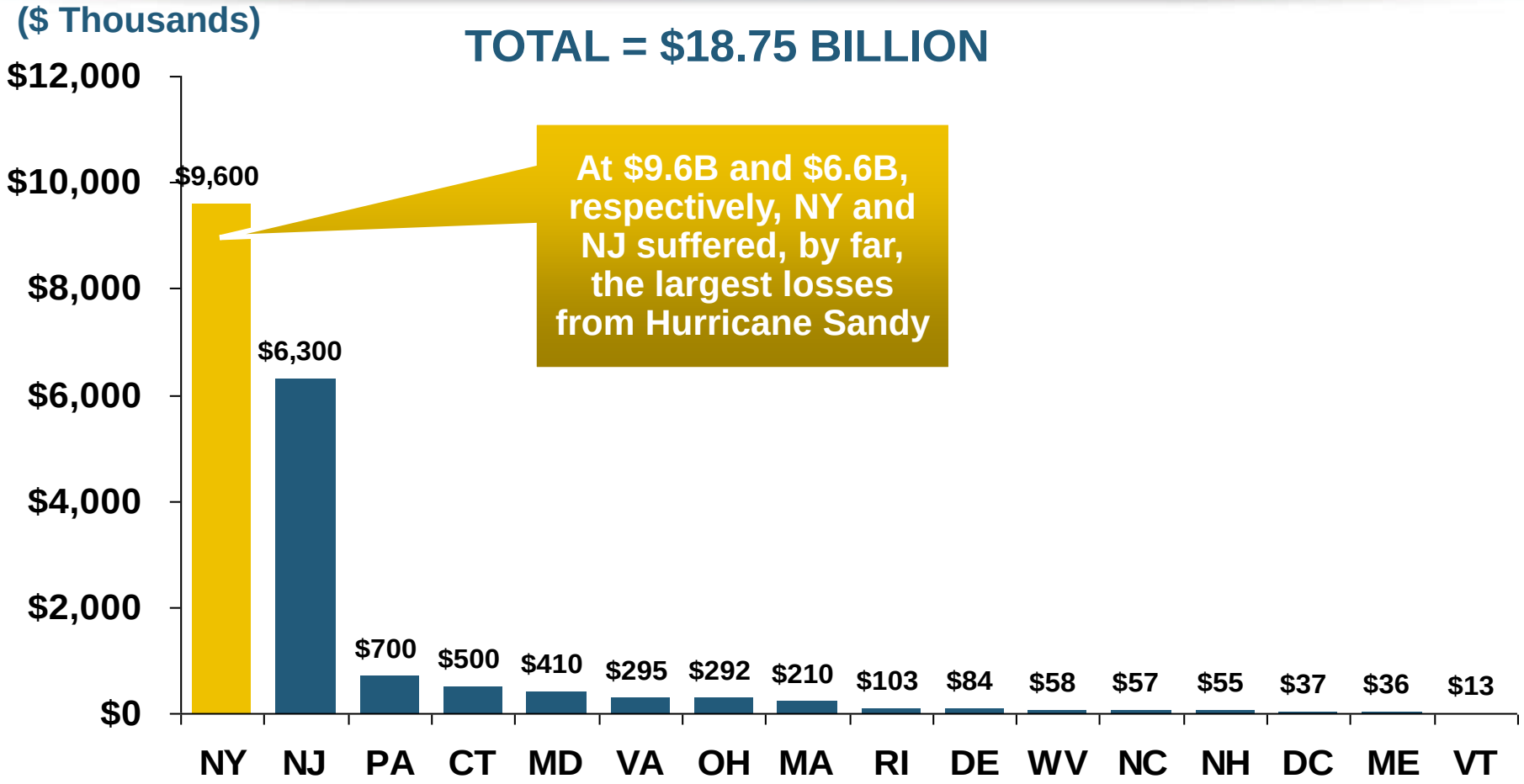
10 of the 12 most costly hurricanes in insurance history occurred over the past 9 years (2004—2012)



*PCS estimate as of 4/12/13.

Sources: PCS; Insurance Information Institute inflation adjustments to 2012 dollars using the CPI.

Hurricane Sandy: Claim Payments to Policyholders, by State



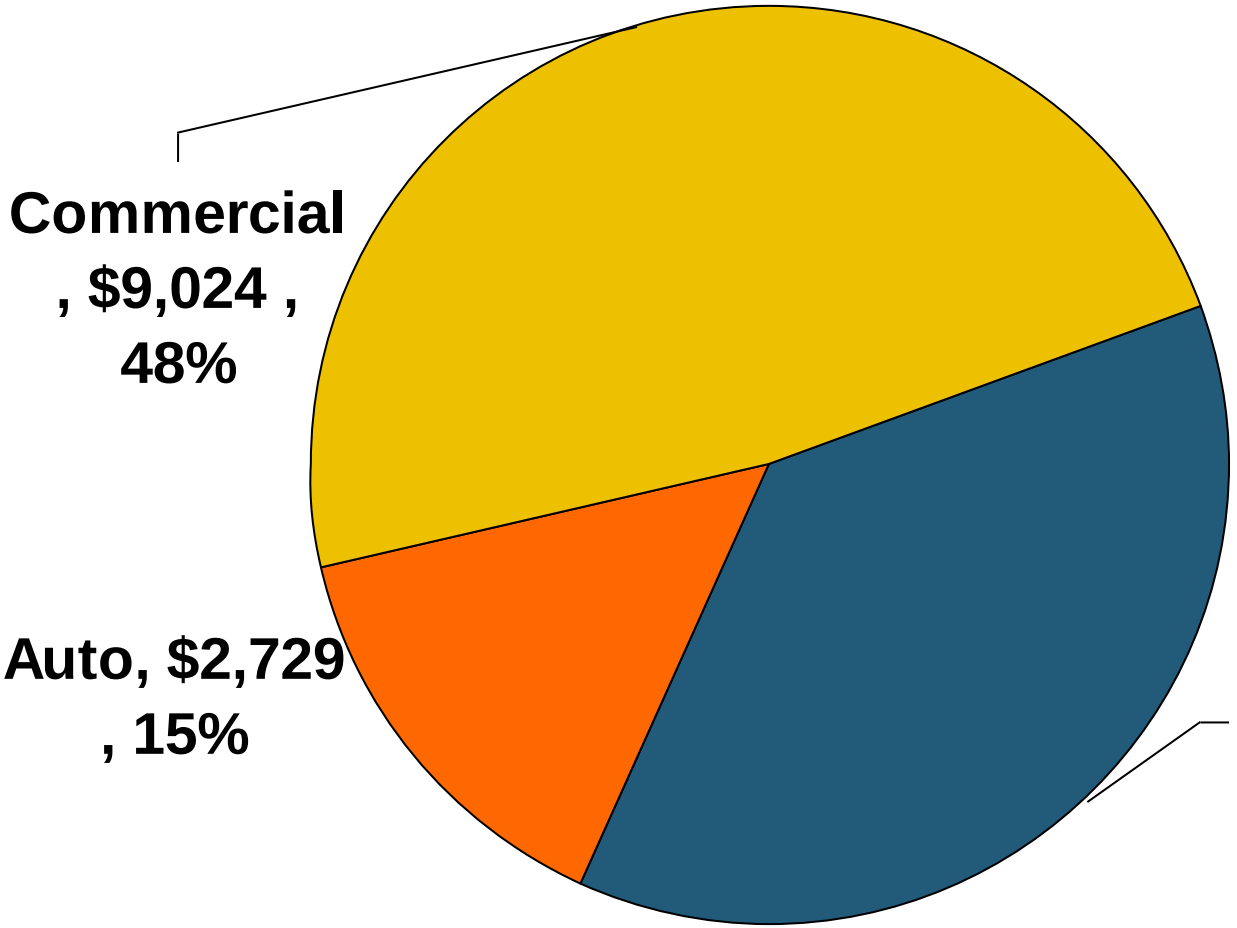
Insurers Will Pay at Least $18.75 Billion to 1.52 Million Policyholders Across 15 States and DC in the Wake of Hurricane Sandy

Sources: Catastrophe loss data is for Catastrophe Serial No. 90 (Oct. 28 – 31, 2012) from PCS as of Jan. 18, 2013; Insurance Information Institute .

Hurricane Sandy: Insured Loss by Claim Type* ($ Millions)

INSURANCE INFORMATION INSTITUTE

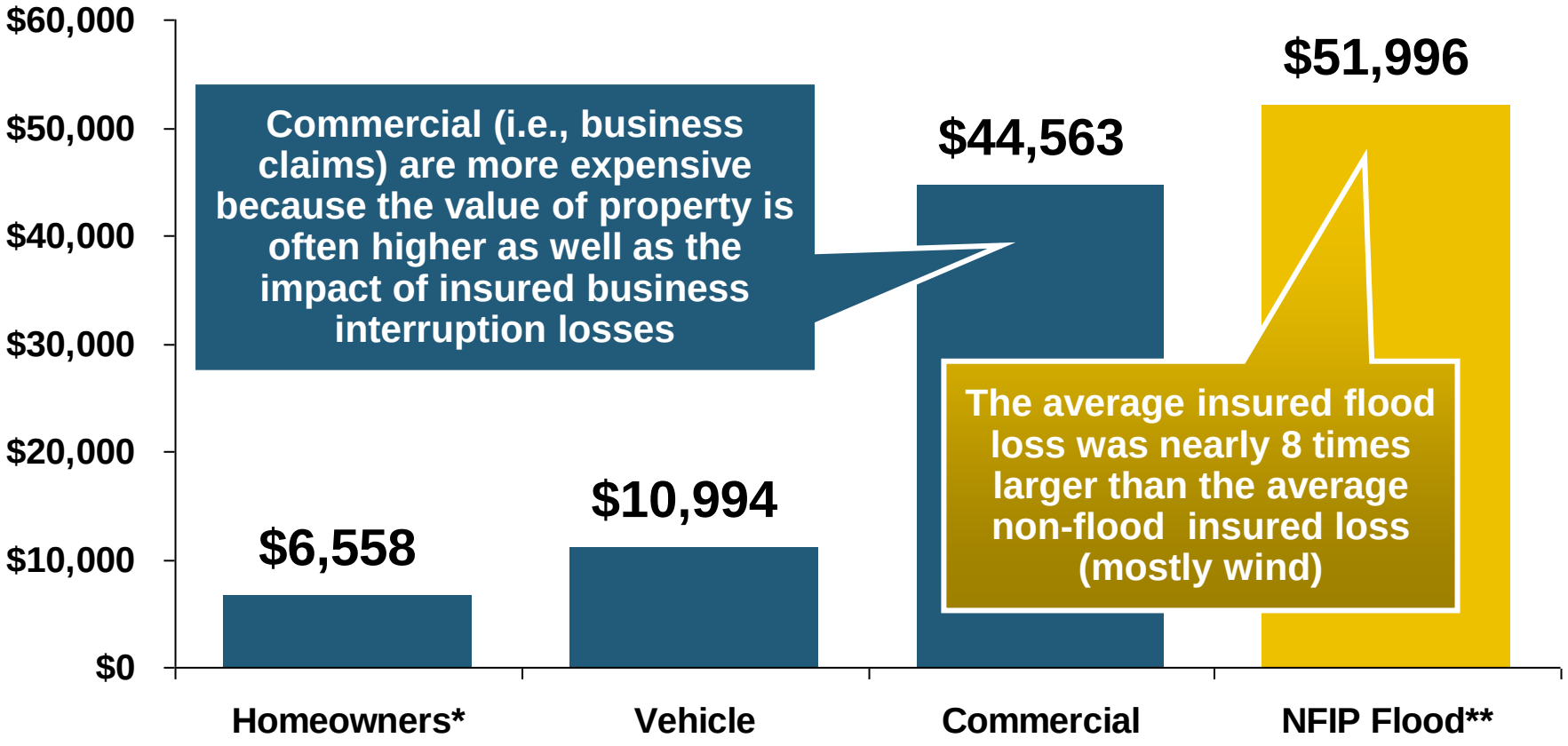
Total Claim Value = $18.75 Billion*



Although Commercial Lines accounted for only 13% of total claims, they account for 48% of all claim dollars paid. In most hurricanes, Commercial Lines accounts for about 1/3 of insured losses.

*PCS insured loss estimates as of 1/18/13. Catastrophe modeler estimates range up to $25 billion. All figures exclude losses paid by the NFIP.
Source: PCS; Insurance Information Institute.

Hurricane Sandy: Average Claim Payment by Type of Claim



Commercial (Business) Claims Were Nearly Seven Times More Expensive than Homeowners Claims; Vehicle Claims Were Unusually Expensive Due to Extensive Flooding

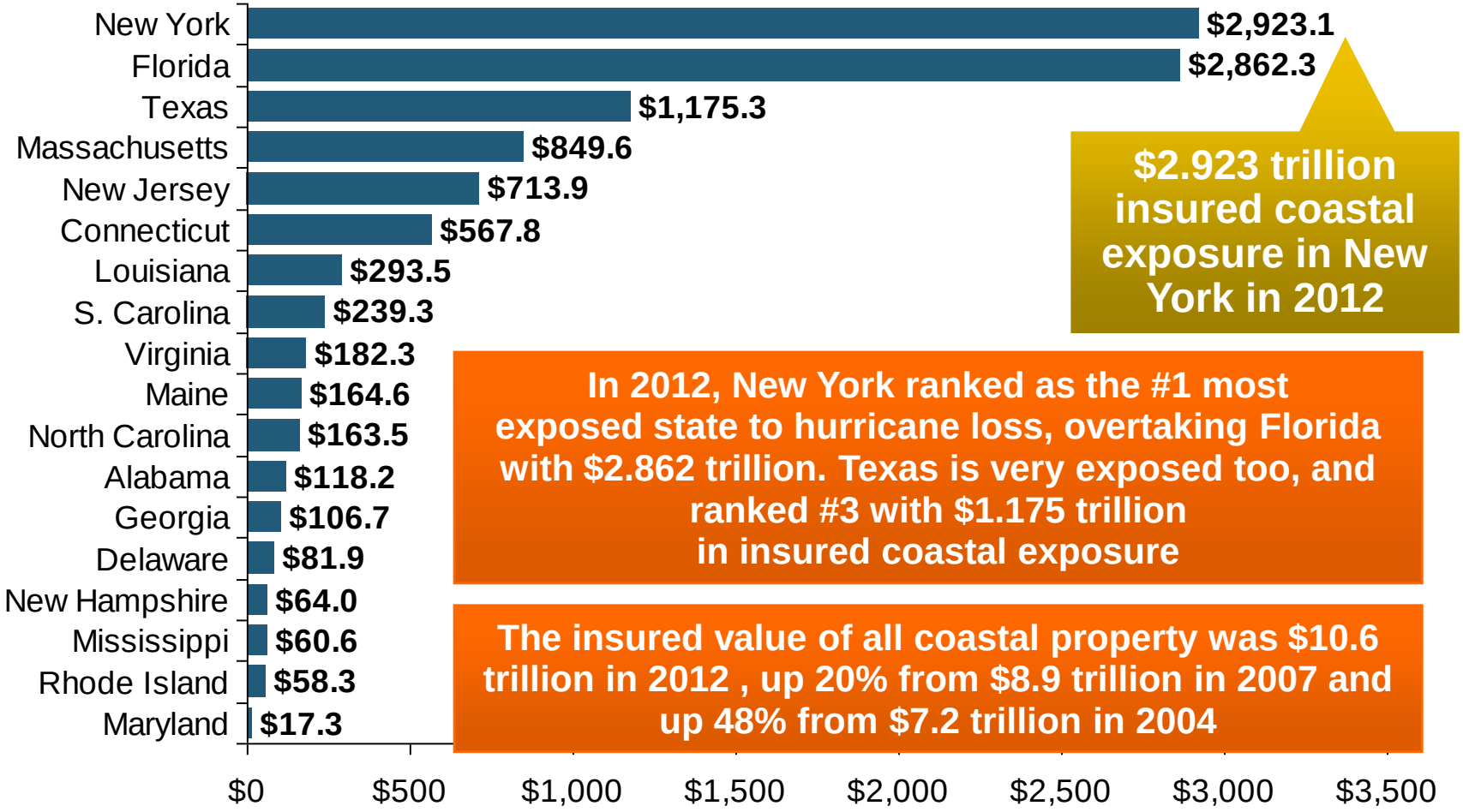
*Includes rental and condo policies (excludes NFIP flood). **Preliminary as of May 14, 2013.

Sources: Catastrophe loss data is for Catastrophe Serial No. 90 (Oct. 28 – 31, 2012) from PCS as of March 2013; Insurance Information Institute.

Total Value of Insured Coastal Exposure in 2012

INSURANCE INFORMATION INSTITUTE

(2012, $ Billions)



$2.923 trillion insured coastal exposure in New York in 2012

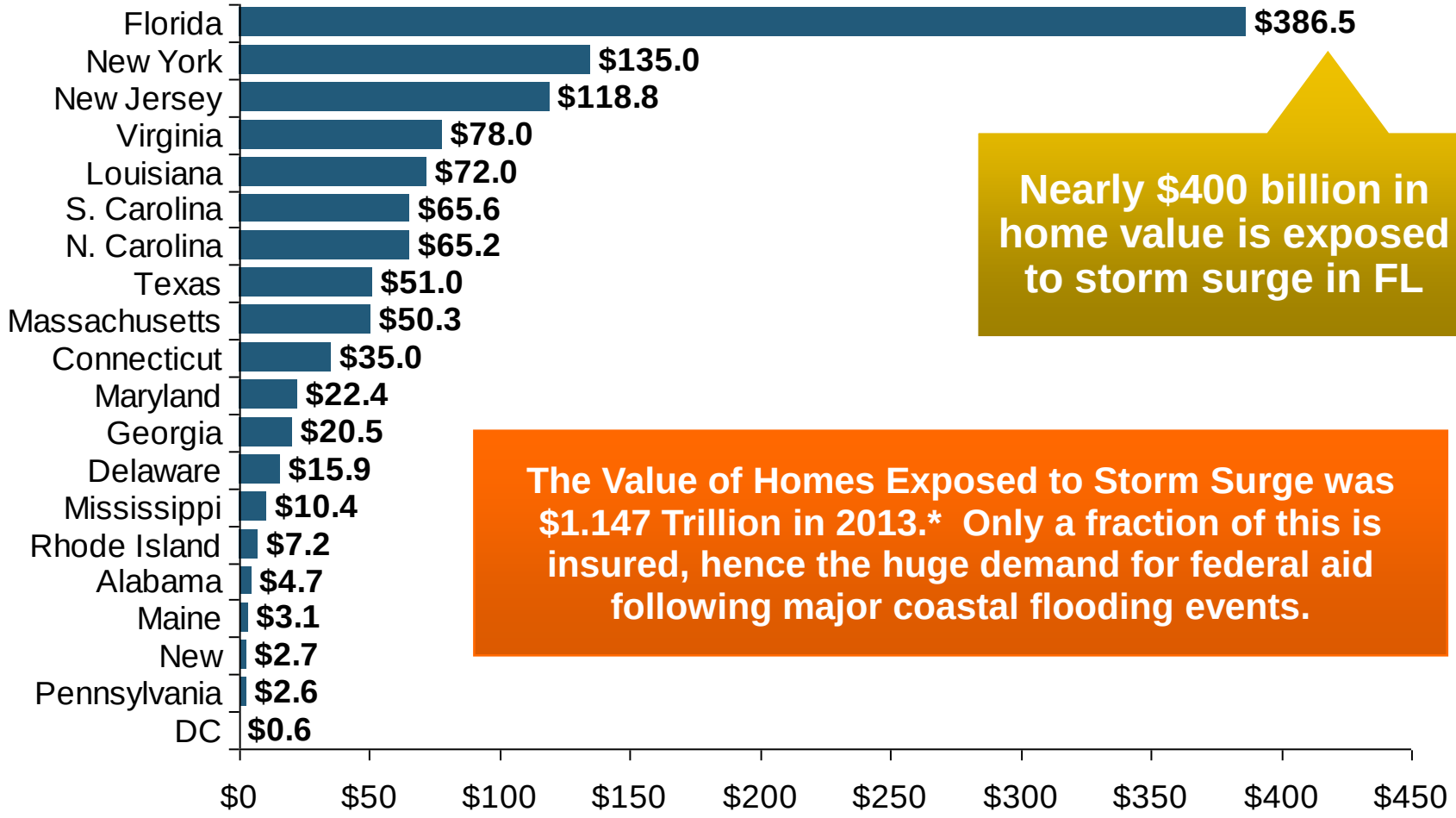
In 2012, New York ranked as the #1 most exposed state to hurricane loss, overtaking Florida with $2.862 trillion. Texas is very exposed too, and ranked #3 with $1.175 trillion in insured coastal exposure

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.

Total Potential Home Value Exposure to Storm Surge Risk in 2013*

($ Billions)



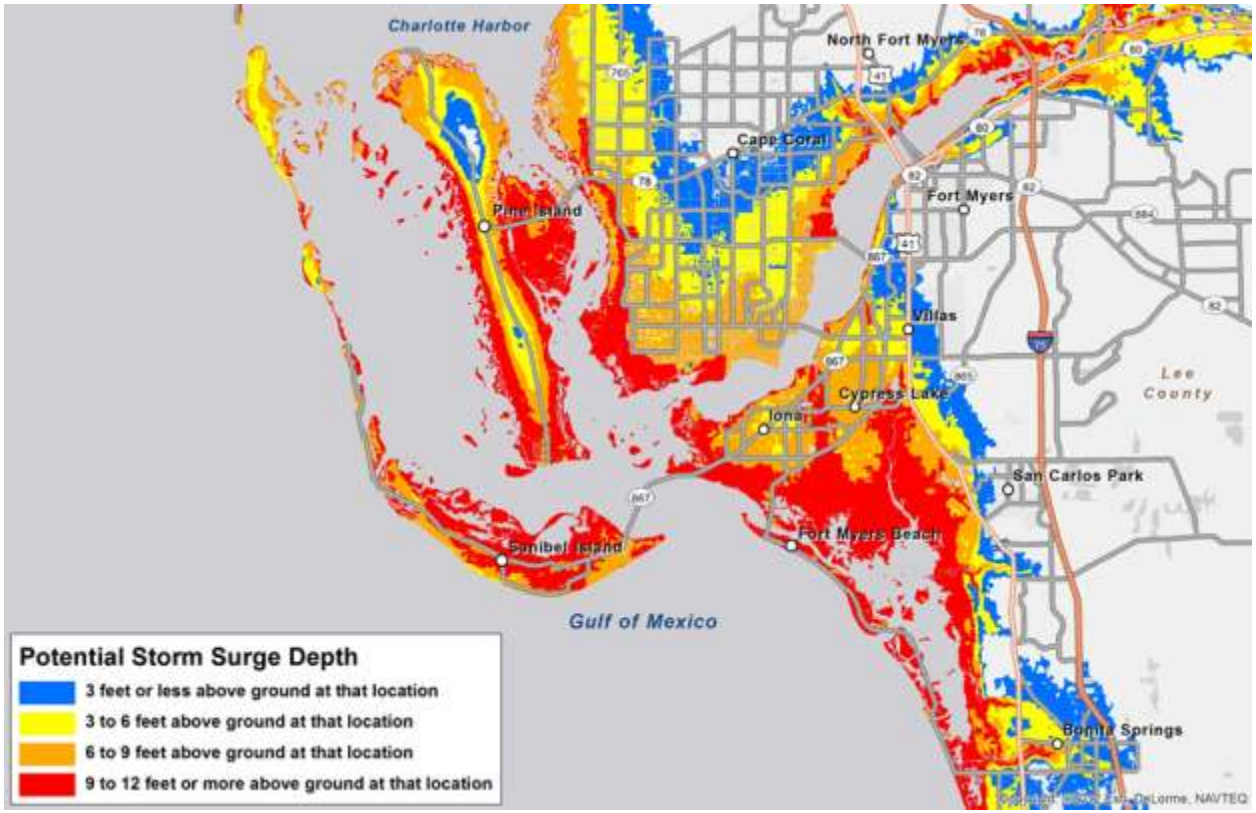
Nearly $400 billion in home value is exposed to storm surge in FL

The Value of Homes Exposed to Storm Surge was $1.147 Trillion in 2013.* Only a fraction of this is insured, hence the huge demand for federal aid following major coastal flooding events.

*Insured and uninsured property. Based on estimated property values as of April 2013.

Source: *Storm Surge Report 2013,* CoreLogic.

Storm Surge Inundation Graphic



- NHC shooting for mid-season for deployment. First of many ways of distributing storm-surge forecasts.

The Weather Channel

INSURANCE INFORMATION INSTITUTE

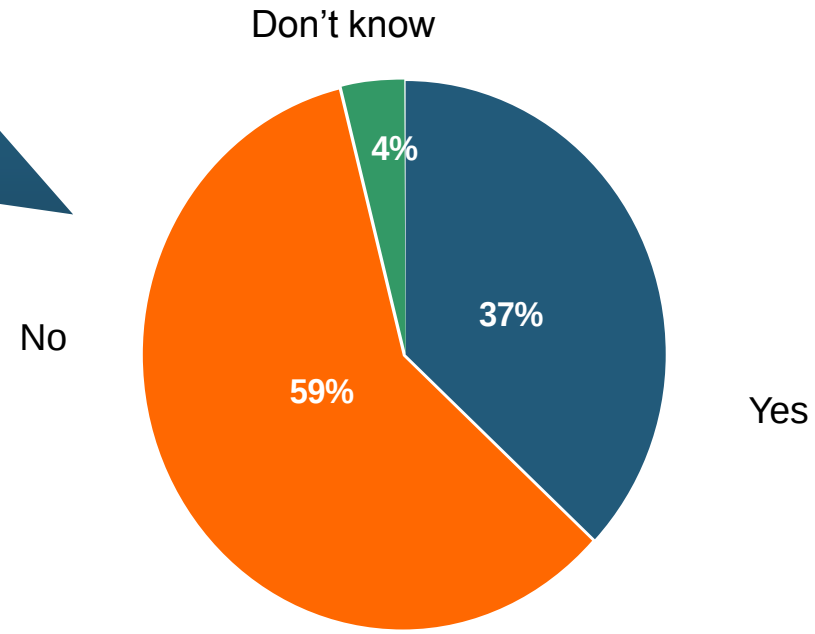
Catastrophe Losses and Public Opinion: First Half 2013 Poll

Many Americans Don't Believe It's Fair to Reflect Higher Catastrophe Losses in Rates; *Government Aid Influences Insurance Purchase Decision*

I.I.I. Poll: Homeowners Insurance

Q. Do you think that it is fair that people who live in areas affected by record storms in 2011 and 2012 should pay more for their homeowners insurance in the future?

Public believes it is not fair to raise premiums of homeowners due to events they cannot control

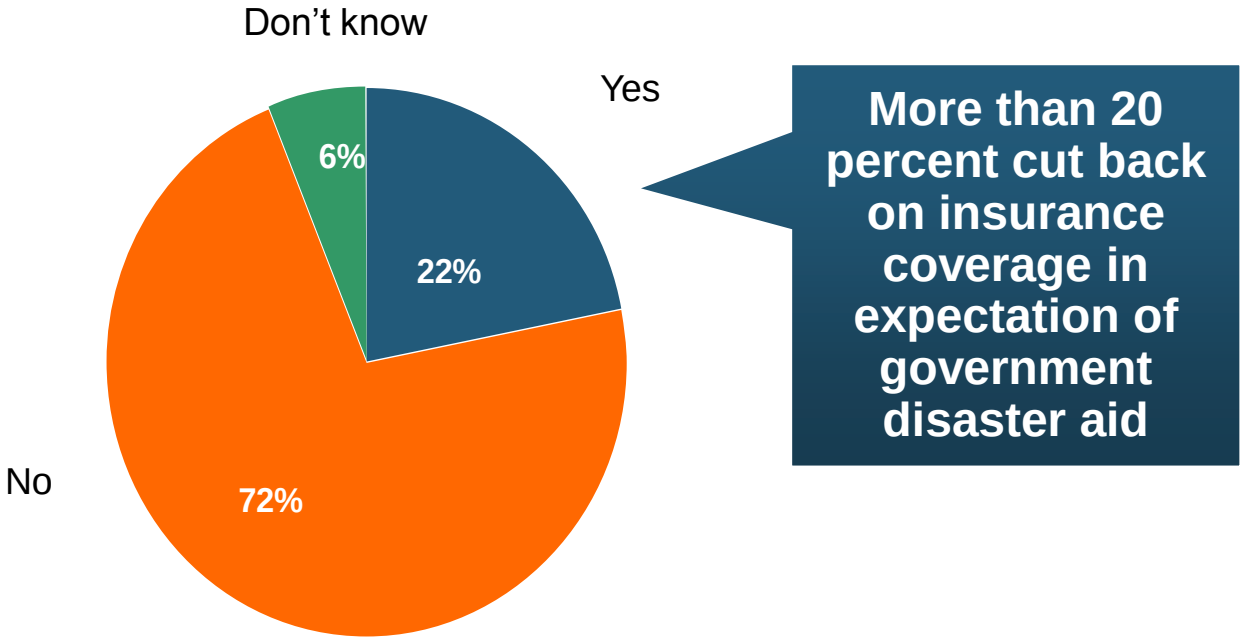


Nearly 60 percent of Americans believe that homeowners insurance premiums should not be raised as a result of recent storms in their areas.

Source: Insurance Information Institute Annual *Pulse* Survey.

I.I.I. Poll: Disaster Preparedness

Q. If you expect some relief from the government, do you purchase less insurance coverage against these natural disasters than you would have otherwise?



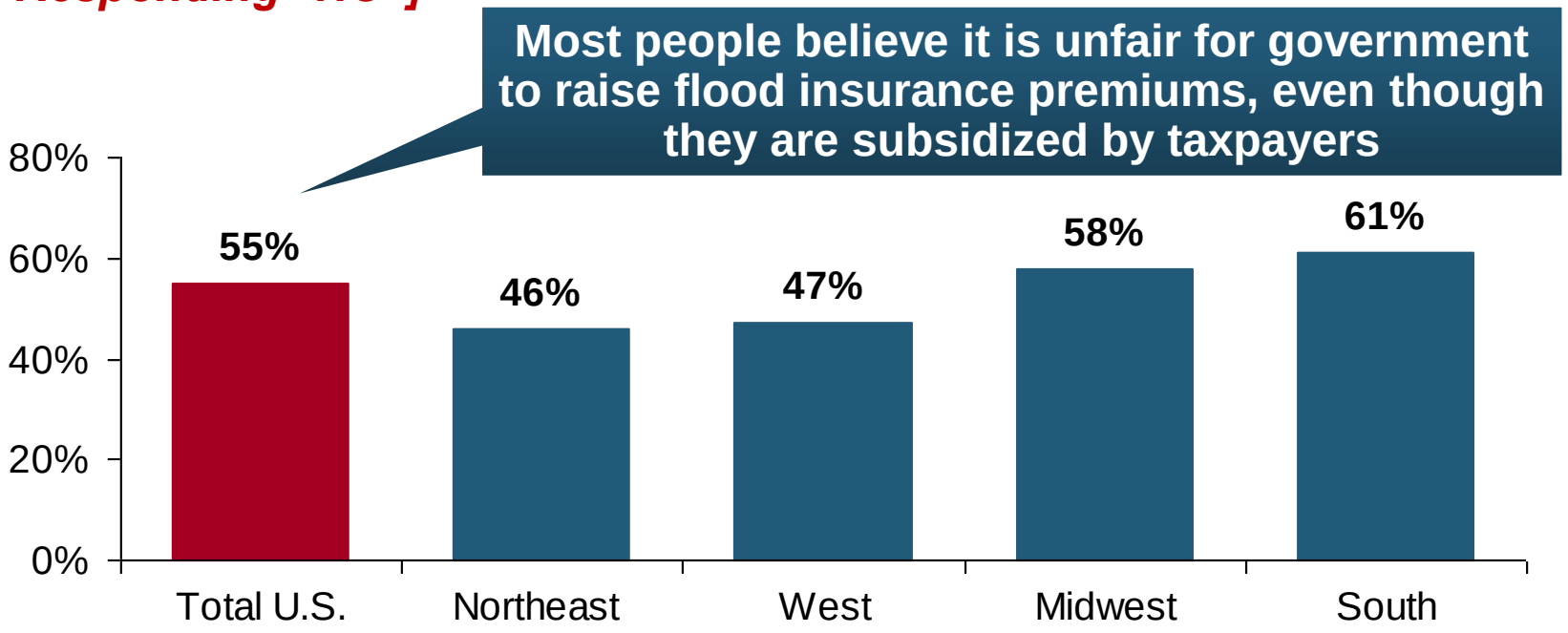
Seventy-two percent of Americans would not purchase less insurance if they expect some relief from the government—but 22% would.

Source: Insurance Information Institute Annual *Pulse* Survey.

I.I.I. Poll: Flood Insurance

Q. The federal government plans to raise the price of flood insurance so it reflects the costs of paying claims. Do you believe this is fair?

[% Responding "NO"]

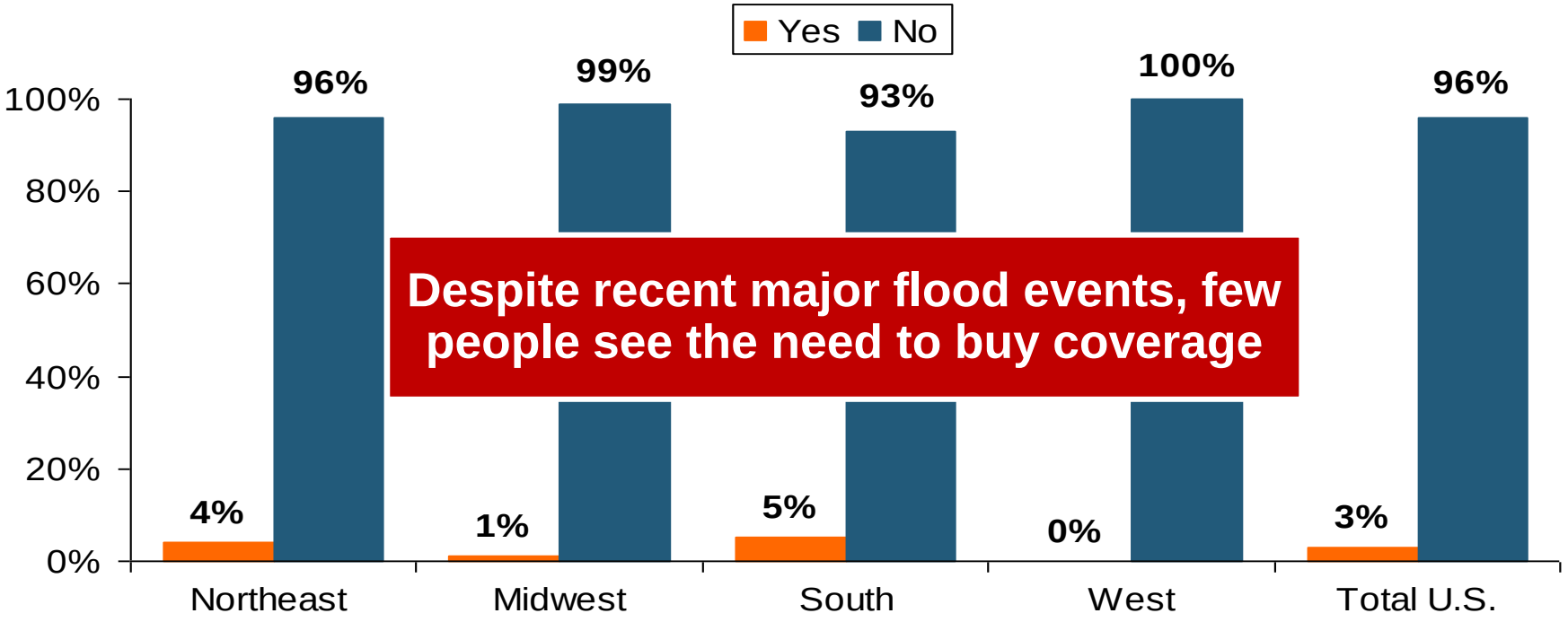


More than one-half of Americans do not think it is fair for the federal government to raise its flood insurance premiums to better reflect claims payouts.

Source: Insurance Information Institute Annual *Pulse* Survey.

I.I.I. Poll: Disaster Preparedness

Q. Have recent flooding events such as Hurricane Sandy or Hurricane Irene motivated you to buy flood coverage?[1]



Recent storms have not motivated people to buy flood insurance coverag.e

[1]Asked of those who have homeowners insurance but not flood insurance.

Source: Insurance Information Institute Annual *Pulse* Survey.

Insurance Information Institute Online:

www.iii.org

Thank you for your time and your attention!

Twitter: twitter.com/bob_hartwig

Munich RE

Question and Answer

Press Question and Answer Process

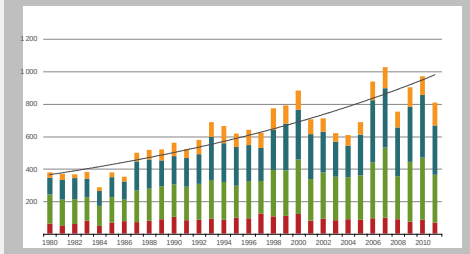
To ask a question, please dial 1 4 on your phone.

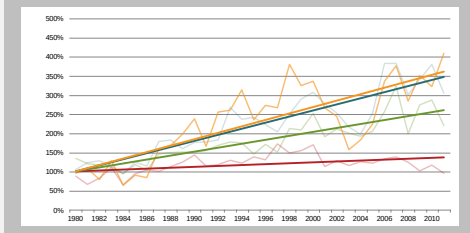
An operator will facilitate your participation.

More Information

Press Inquiries
Terese Rosenthal
Phone: +1 (609) 243-4339
E-mail: trosenthal@munichreamerica.com

NatCatSERVICE Downloadcenter for statistics and analyses on natural disasters





The downloadcenter provides **free** access:

- Annual statistics
- Long-term statistics
- Information on significant natural disasters
- Focus analyses
- NatCatSERVICE methodology, info brochure
- Publication Topics Geo

www.munichre.com/natcatservice/downloadcenter/en

More Information

	Connect with Munich Re	Connect with I.I.I.
Twitter	@Munichre_US @Munichre	@iiiorg
LinkedIn	munich-reinsurance-america-inc.	Insurance Information Institute
Google+	Munich Re (US) Munich Re	Insurance Information Institute
YouTube	MunichReUs MunichReVideo	iiivideo
Facebook	Munichreus1 Munichre	InsuranceInformationInstitute
Flickr		iiiorg

Thank you very much for attending

July 9, 2013

Munich RE

Munich RE