



The Actuarial Profession
making financial sense of the future

32nd ANNUAL GIRO CONVENTION

18-21 October 2005, The Imperial Hotel, Blackpool

Hurricane Katrina

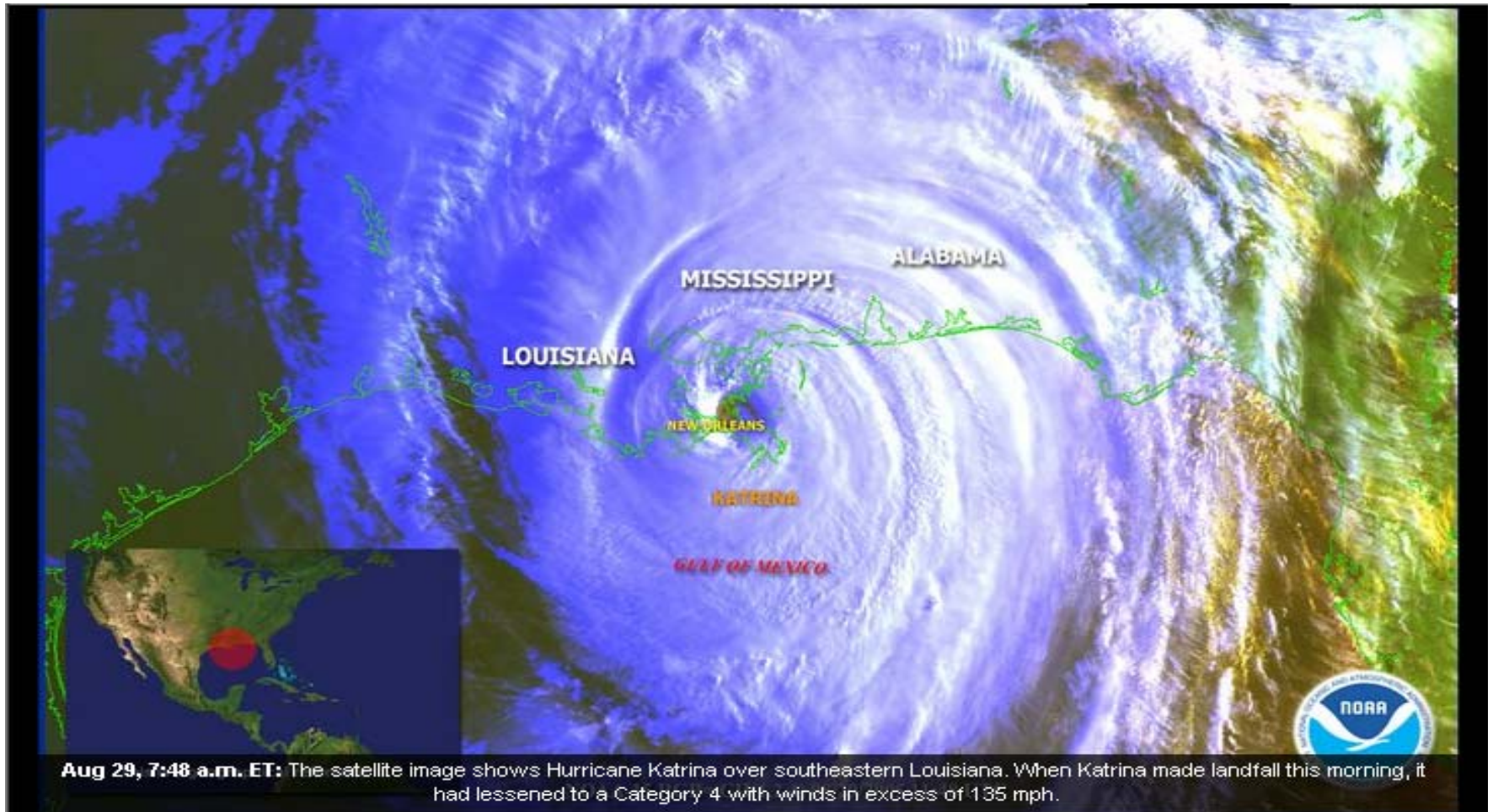


Lis Gibson - Douglas Collins - Stuart Shepley - Phil Archer-Lock

Hurricane Katrina: Agenda

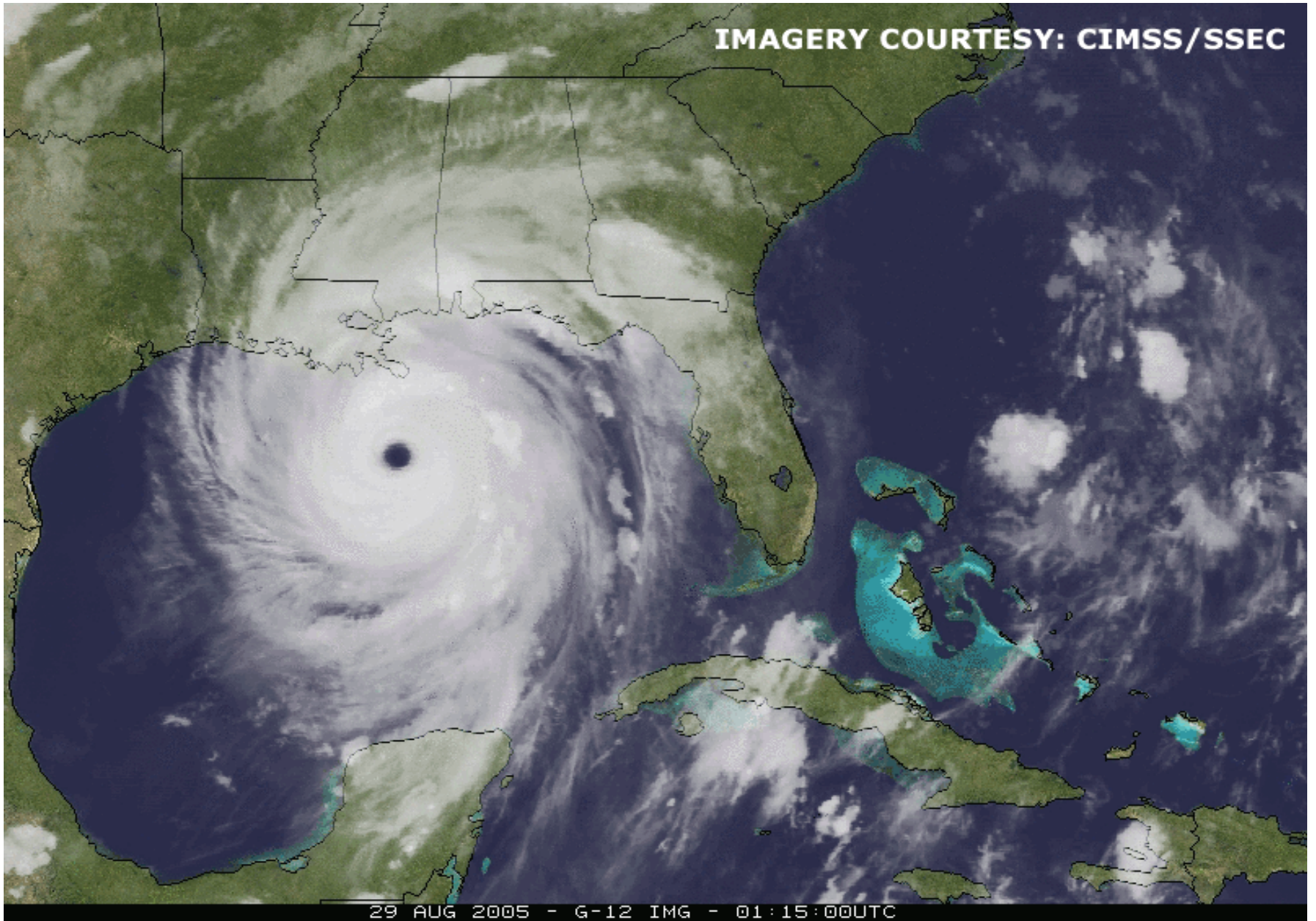
- **The Storm**
- Estimating the Market Loss
- Global Warming?
- Comments, Implications, Issues
- Opinion/Reserving Report wordings

Katrina – The Storm



Aug 29, 7:48 a.m. ET: The satellite image shows Hurricane Katrina over southeastern Louisiana. When Katrina made landfall this morning, it had lessened to a Category 4 with winds in excess of 135 mph.

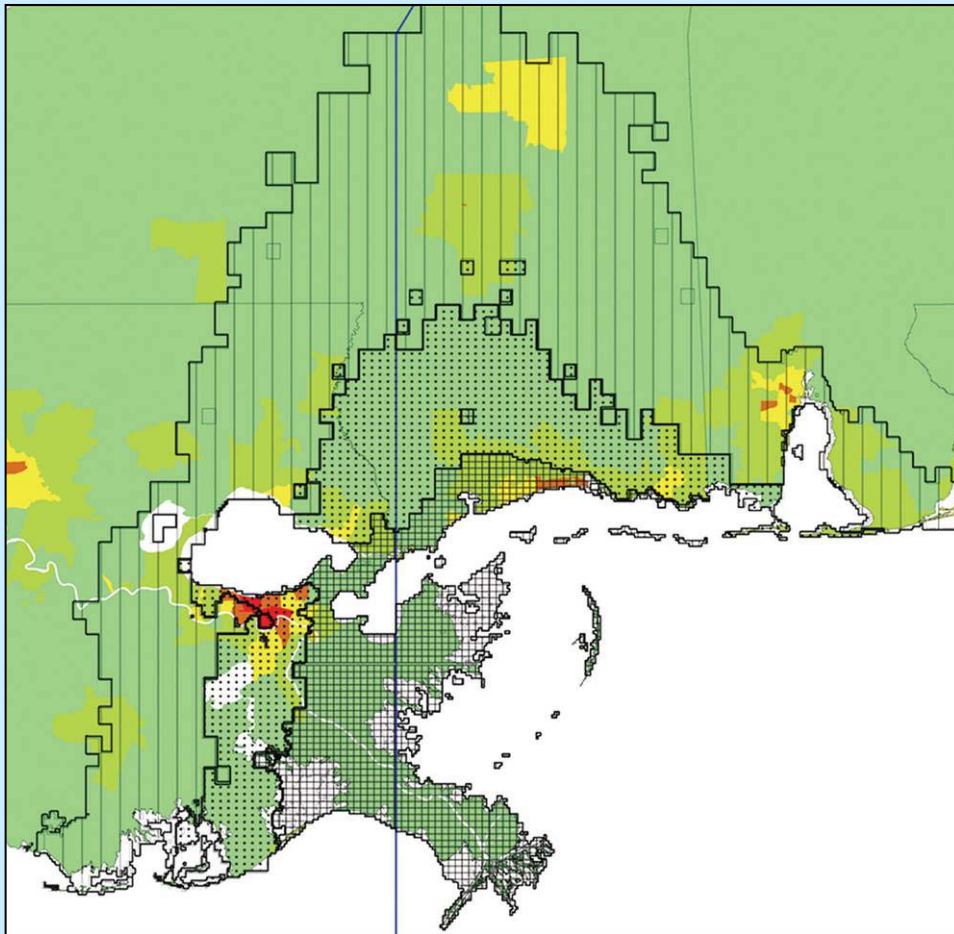
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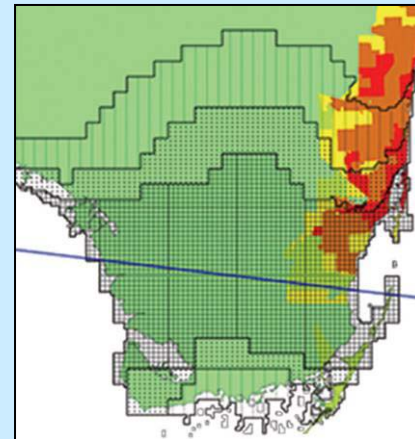
29 AUG 2005 - G-12 IMG - 01:15:00UTC

Katrina was a larger storm than Andrew,
with damaging winds affecting more coastline

Hurricane Katrina



Hurricane Andrew



Wind Speed (MPH)

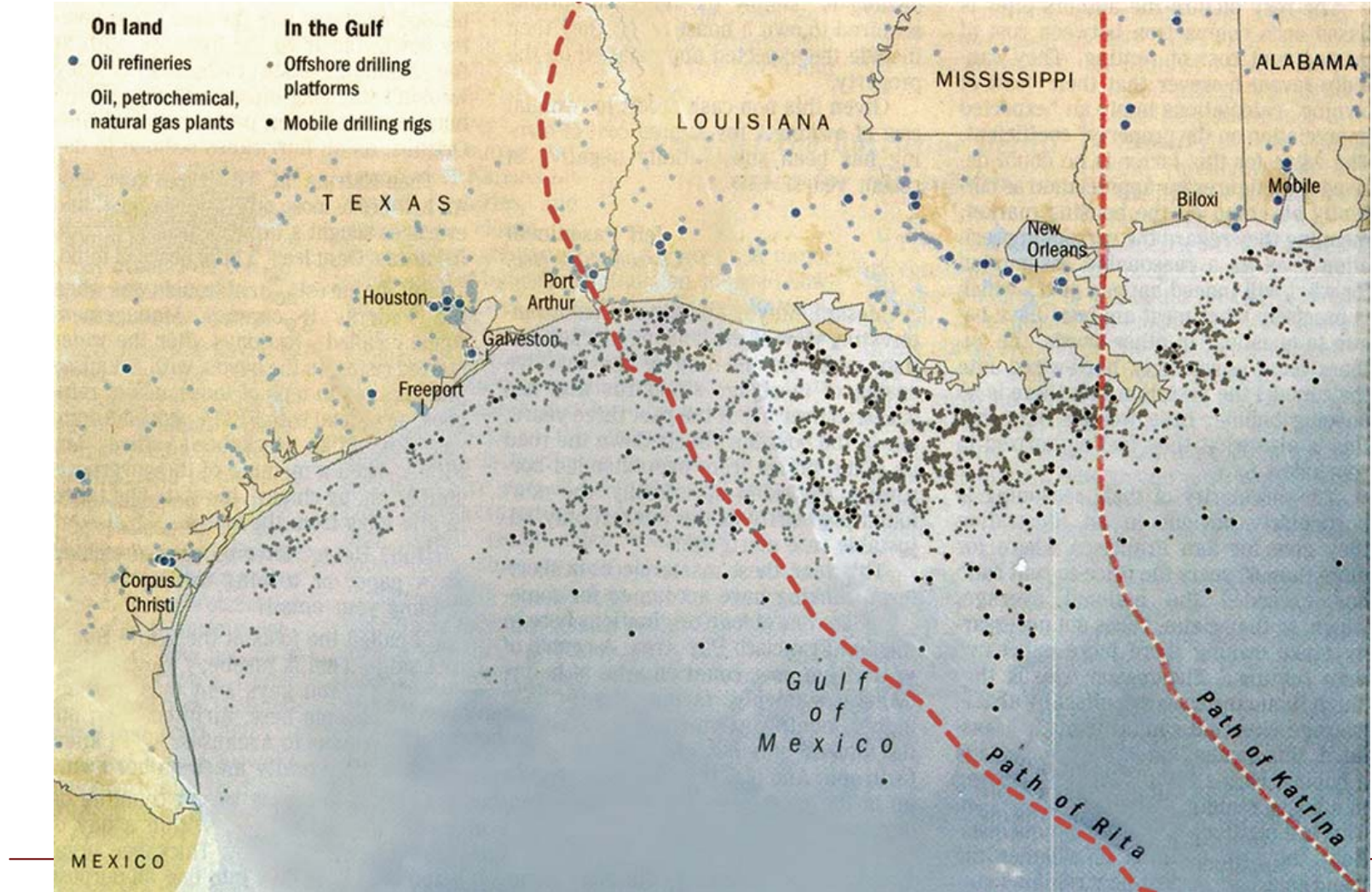
- 80 - 100
- 100 - 120
- 120 - 200

Households per Square Mile

- 2,500 to 10,000
- 1,000 to 2,500
- 250 to 1,000
- 50 to 250
- 0 to 50

Source: Wind speeds — Risk Management Solutions;
Household counts — Applied Geographic Solutions, Simi Valley, CA

The offshore energy sector has significant exposure on the Texas and Louisiana Gulf Coast



Sources: *The Wall Street Journal*, September 22, 2005; Rita's path courtesy of NOAA — National Hurricane Center

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Tillinghast estimate of insured losses is \$39.9 to \$54.6 billion

	Low Estimate	High Estimate
Personal Property Lines		
Homeowners/Property	14.0	17.0
Automobiles	1.0	2.0
Watercraft	0.2	0.3
<i>Total</i>	<i>15.2</i>	<i>19.3</i>
Commercial Property Lines		
Property	13.5	16.0
Business Interruption	6.0	9.0
Automobiles/Trucks	0.2	0.3
<i>Total</i>	<i>19.7</i>	<i>25.3</i>
Marine & Energy	4.0	6.0
Liability	1.0	3.0
Other	0.0	1.0
Total All Lines	39.9	54.6

Tillinghast estimate of insured losses is \$39.9 to \$54.6 billion

	Low Estimate	High Estimate
Primary Insurers	18.8	28.9
Reinsurers	20.7	24.0
Capital Markets	0.4	1.6
Total	39.9	54.6

Other Estimates of industry losses for Hurricane Katrina

- Risk Management Solutions (RMS)
 - Between \$40 billion and \$60 billion (9 Sep 05)
- AIRWorldwide (AIR)
 - Between \$26 billion and \$34 billion (Oct 05)
- Eqecat
 - Between \$26 billion and \$43 Billion (22 Sep 05)

Components of RMS estimates for Hurricane Katrina

RMS	Low Estimate (\$ billion)	High Estimate (\$ billion)
Wind Storm and Sea Surge	20	25
Flood, private not inc. govt.	15	25
Off Shore Energy, Marine	2	5
Miscellaneous, poss. pollution	2	3
1st Landfall (Florida)	1	2
Total	40	60

Lloyd's company exposures to Katrina: Net Estimates in \$m

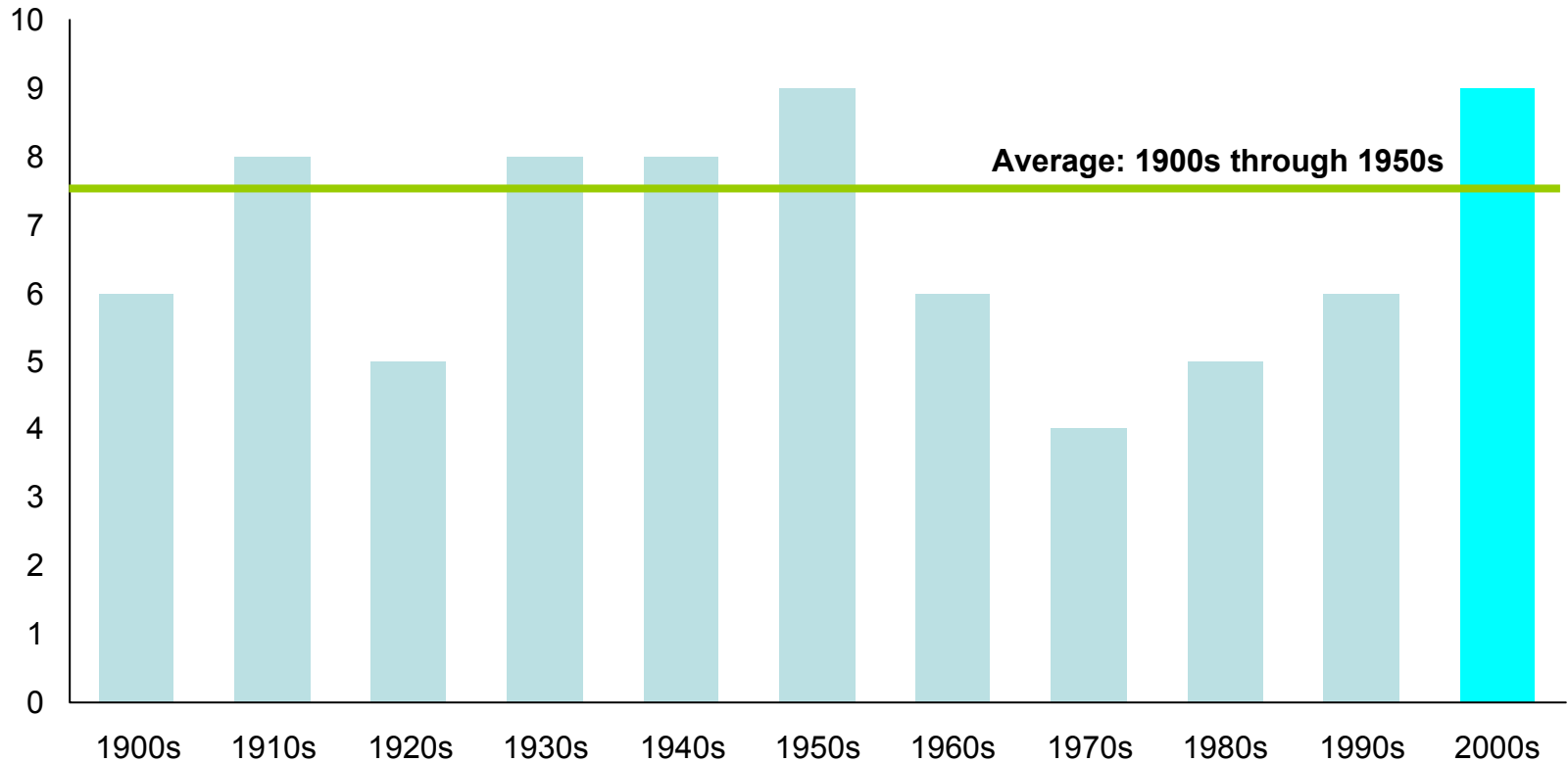
<i>Company</i>	<i>Estimates in \$ m</i>
Advent	112
Amlin	110
Beazlev	50
Brit	220
Catlin	125
Chaucer	64
Hardy	10
Heritage	7
Hiscox	110
Kiln	63
SVB	45
Wellington	125

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The frequency of U.S. hurricanes is returning to levels experienced prior to the 1960s

Number of Major (3, 4, 5) Hurricanes Hitting the U.S. by Decade



Source: Hurricane data from the National Hurricane Center; figure for 2000s is extrapolated from actual experience to date

- Globally, no trend in overall hurricane frequency is evident in historical data

When past losses are adjusted to today's exposures and values, there is no discernable trend in losses

Insured Losses from Past Hurricanes — Adjusted for Inflation, Growth in Coastal Properties, Real Growth in Property Values and Increased Property Insurance Coverage

Year	Hurricane	Major Landfall	Estimated Insured Losses At 2005 Levels (\$ billions)
1926	Number 6	Florida	65.3
1992	Andrew	Florida	31.3
1900	Number 1	Texas	21.1
1915	Number 2	Texas	20.8
1965	Betsy	Louisiana	14.5
1928	Number 4	Florida	13.1
1919	Number 2	Florida	12.6
1938	Number 4	New York	12.4
1954	Hazel	North Carolina	11.0
1909	Number 9	Florida	10.1

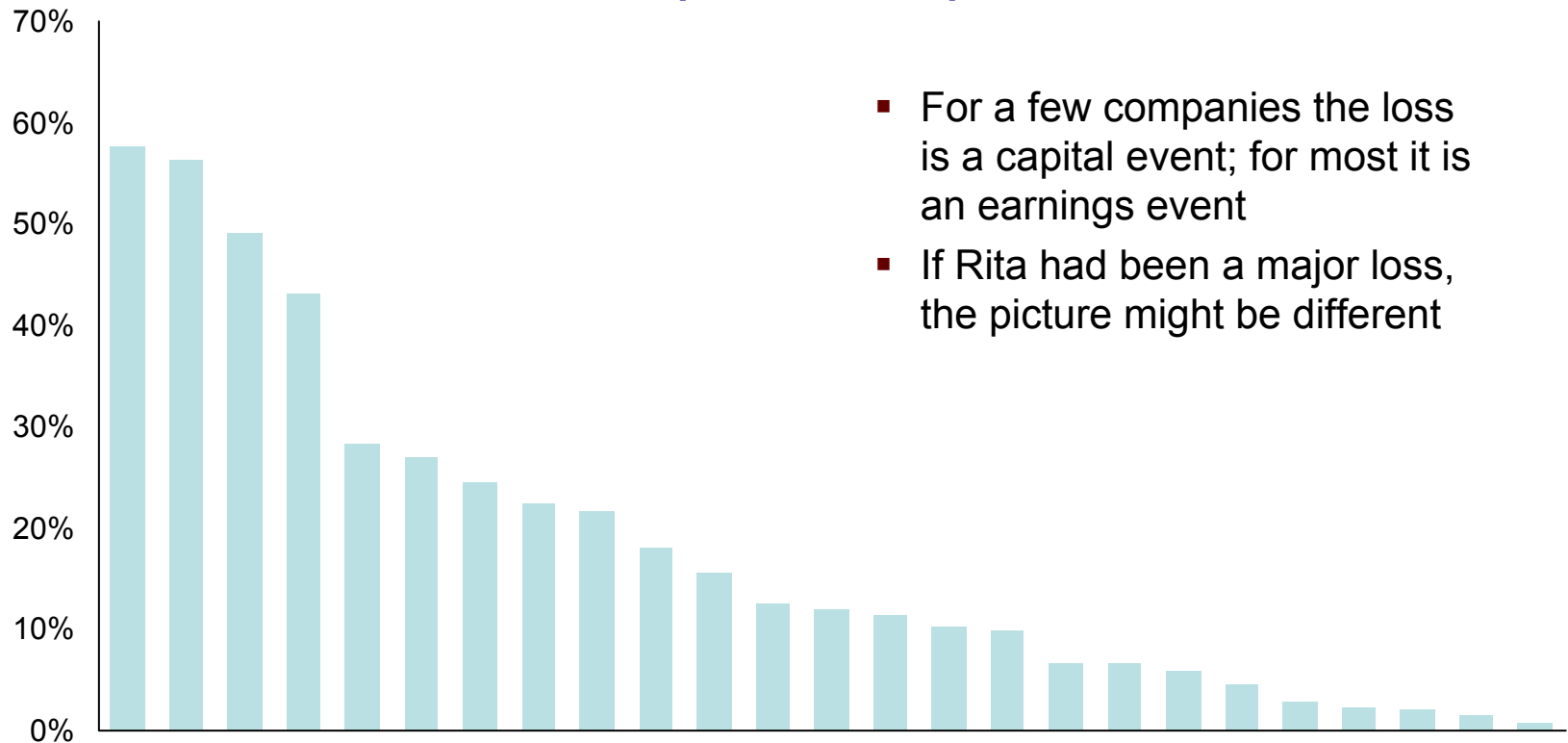
- **Conclusion:** the build-up of insured property in coastal areas is the real issue
 - More properties; higher real value
- On an all-perils basis, Katrina was perhaps a one-in-fifty-year event

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Based on Tillinghast's estimate of losses, a small number of companies will suffer serious reductions in capital

Estimated After-Tax Loss as Percent of Capital Sample of 25 Companies



- For a few companies the loss is a capital event; for most it is an earnings event
- If Rita had been a major loss, the picture might be different

- Sample reflects companies with estimated after-tax loss in excess of \$250 million; includes both primary and reinsurance companies; companies vary in size

A number of issues add to the uncertainty of the ultimate cost of Katrina claims

- Due to unprecedented scale of damage, demand surge will drive up prices of home and commercial property repairs
- Storm surge is considered flood rather than wind, but ambiguity traditionally resolved in favor of the insured
- Greater proportion of commercial losses, which are more complex
- Additional living expenses and business interruption coverage losses will depend on how long recovery takes
- Some areas remain inaccessible to adjusters
- Mold may contribute to damages, especially where power is out for extended time
- Liability claims are a wildcard; negligent care, errors and omissions, and pollution claims are likely
 - U.S. Chamber of Commerce considers Louisiana, Mississippi and Alabama to be among the top five most unfavorable legal climates

Coverage Issues

- What constitutes an occurrence?
- How many events?
- Causation: wind, rain or storm surge?

Apart from reserving implications, what else for actuaries to think about...

- Cat modelling calibration and credibility
 - Pricing
 - Capital Modelling/ICA

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WTC Wordings per the Advisory Note

- Wording 1
 - Nil or immaterial WTC exposure
- Wording 2
 - Material WTC exposure. Silent as to extent of any uncertainty. May be used restricted by class/year.
- Wording 3
 - Material WTC exposure. “Great deal” of uncertainty. May be used restricted to class/year.

WTC Wordings – in practice

- Wording 1
 - Nil or immaterial WTC exposure
- Wording 2a
 - Material WTC exposure. Silent as to extent of any uncertainty. May be used restricted by class/year.
- Wording 2b
 - Material WTC exposure. Increases uncertainty but less than “fundamental” uncertainty. May be used restricted by class/year.
- Wording 3
 - Material WTC exposure. “Great deal” of uncertainty. May be used restricted to class/year.
 - Many accountants used an SAO Wording 3 as a trigger for a “Fundamental Uncertainty” comment in the audit opinion. Some made their own judgement.

Possible Katrina (or any issue) wordings

- Wording 1
 - Nil or immaterial (issue) exposure
- Wording 2
 - Material (issue) exposure. Silent as to extent of any uncertainty. May be used restricted by class/year.
- Wording 3
 - Material (issue) exposure. Increases uncertainty but less than “fundamental” uncertainty. May be used restricted by class/year.
- Wording 4
 - Material (issue) exposure. “Great deal” of uncertainty. May be used restricted to class/year.

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Next Steps...Hurricane Wilma?