

R in Insurance

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useR! Lightning Talk
11 July 2013

Insurance is not boring



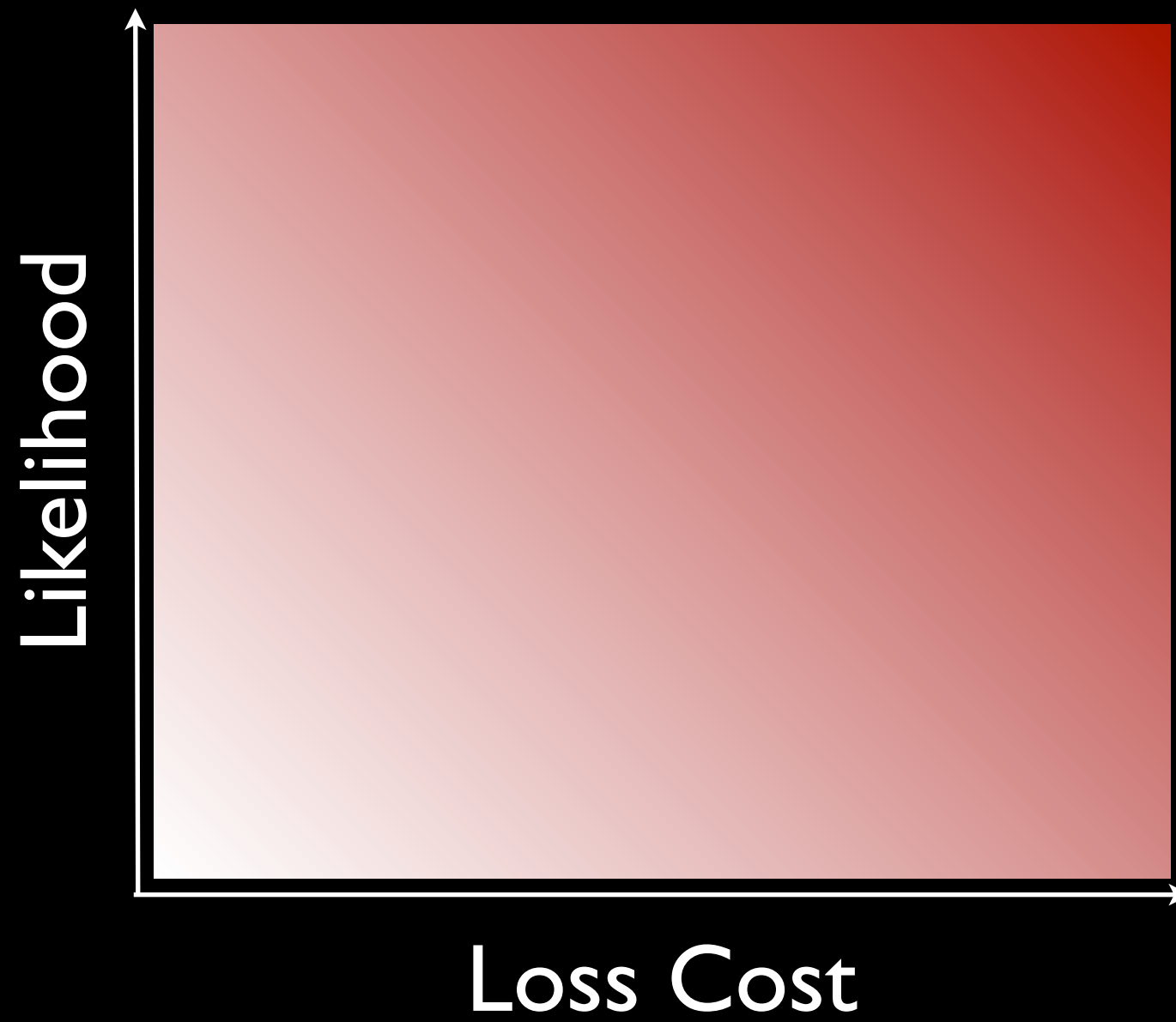
Insurance allows you to
take risks

Risk starts with R

Use cases for R

- Pricing
- Reserving
- Capital modelling
- Catastrophe modelling
- Exposure management

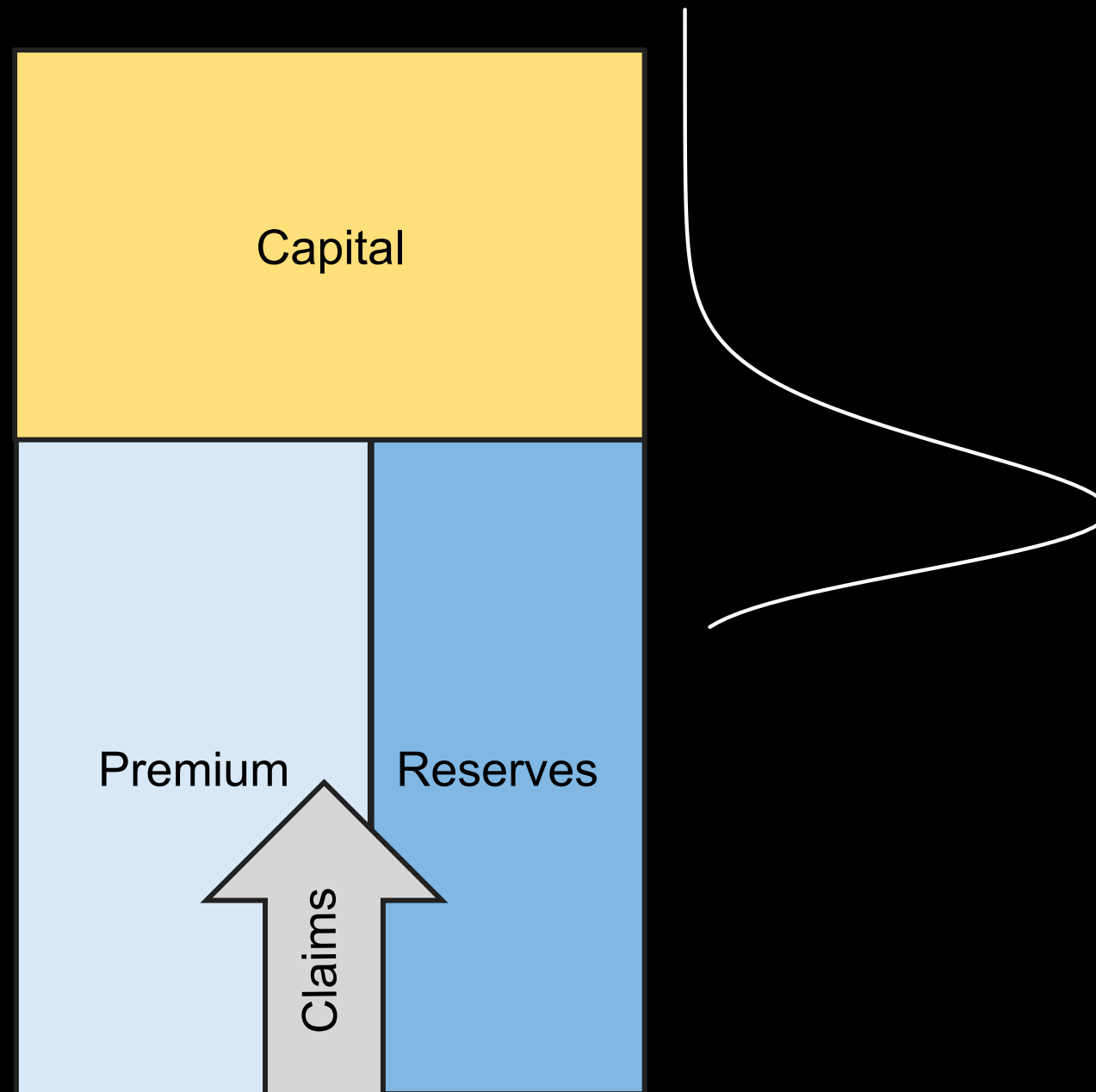
Pricing



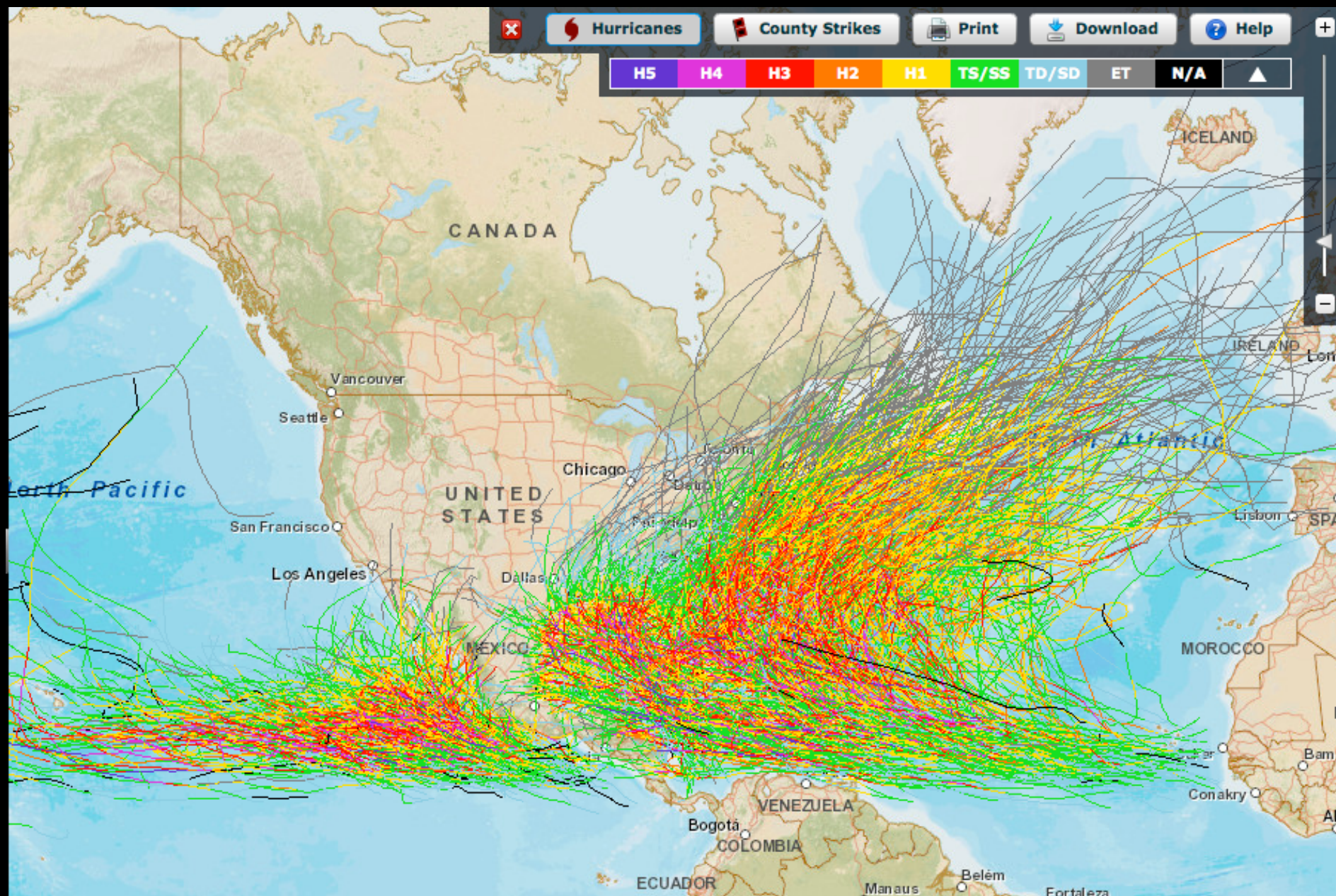
Reserving

dev										
origin	1	2	3	4	5	6	7	8	9	10
1981	5012	8269	10907	11805	13539	16181	18009	18608	18662	18834
1982	106	4285	5396	10666	13782	15599	15496	16169	16704	NA
1983	3410	8992	13873	16141	18735	22214	22863	23466	NA	NA
1984	5655	11555	15766	21266	23425	26083	27067	NA	NA	NA
1985	1092	9565	15836	22169	25955	26180	NA	NA	NA	NA
1986	1513	6445	11702	12935	15852	NA	NA	NA	NA	NA
1987	557	4020	10946	12314	NA	NA	NA	NA	NA	NA
1988	1351	6947	13112	NA	NA	NA	NA	NA	NA	NA
1989	3133	5395	NA	NA	NA	NA	NA	NA	NA	NA
1990	2063	NA	NA	NA	NA	NA	NA	NA	NA	NA

Capital modelling

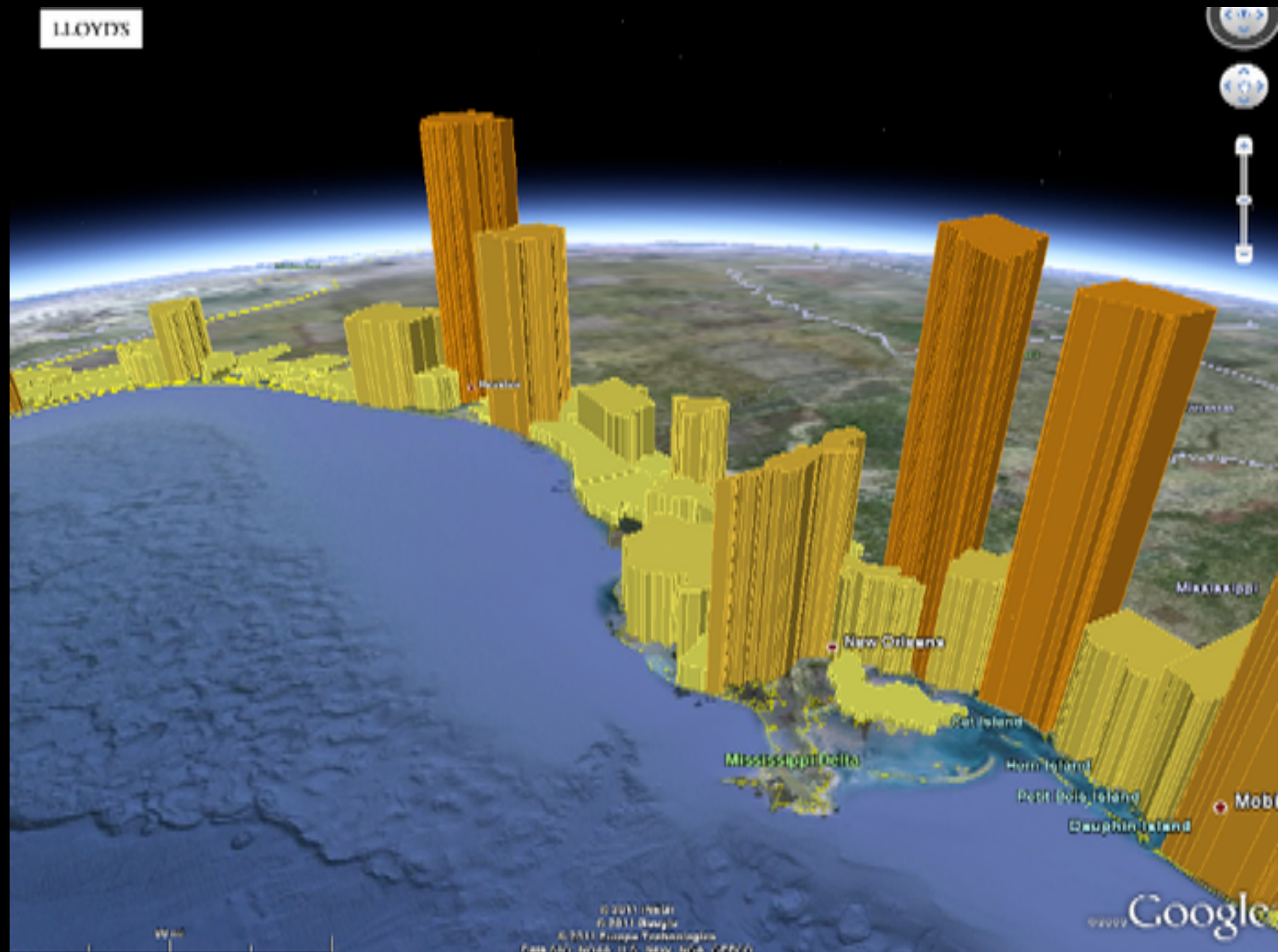


Catastrophe modelling



Source: NOAA, <http://www.csc.noaa.gov/hurricanes/#app=3d30&3722-selectedIndex=2>

Exposure management



THE INSURANCE GAP

When catastrophe strikes, too many countries are unprepared.

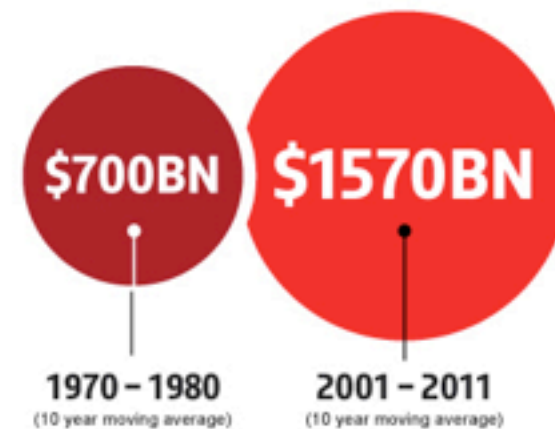
2011, THE COSTLIEST YEAR EVER FOR CATASTROPHES,
DEMONSTRATES A HUGE GAP



HOW MUCH OF AN ANOMALY? - OUR RESEARCH USES
DATA OVER SEVEN YEARS AND SHOWS:



STILL A LONG WAY TO GO ...



COST OF NATURAL
CATASTROPHES

↑ 124%

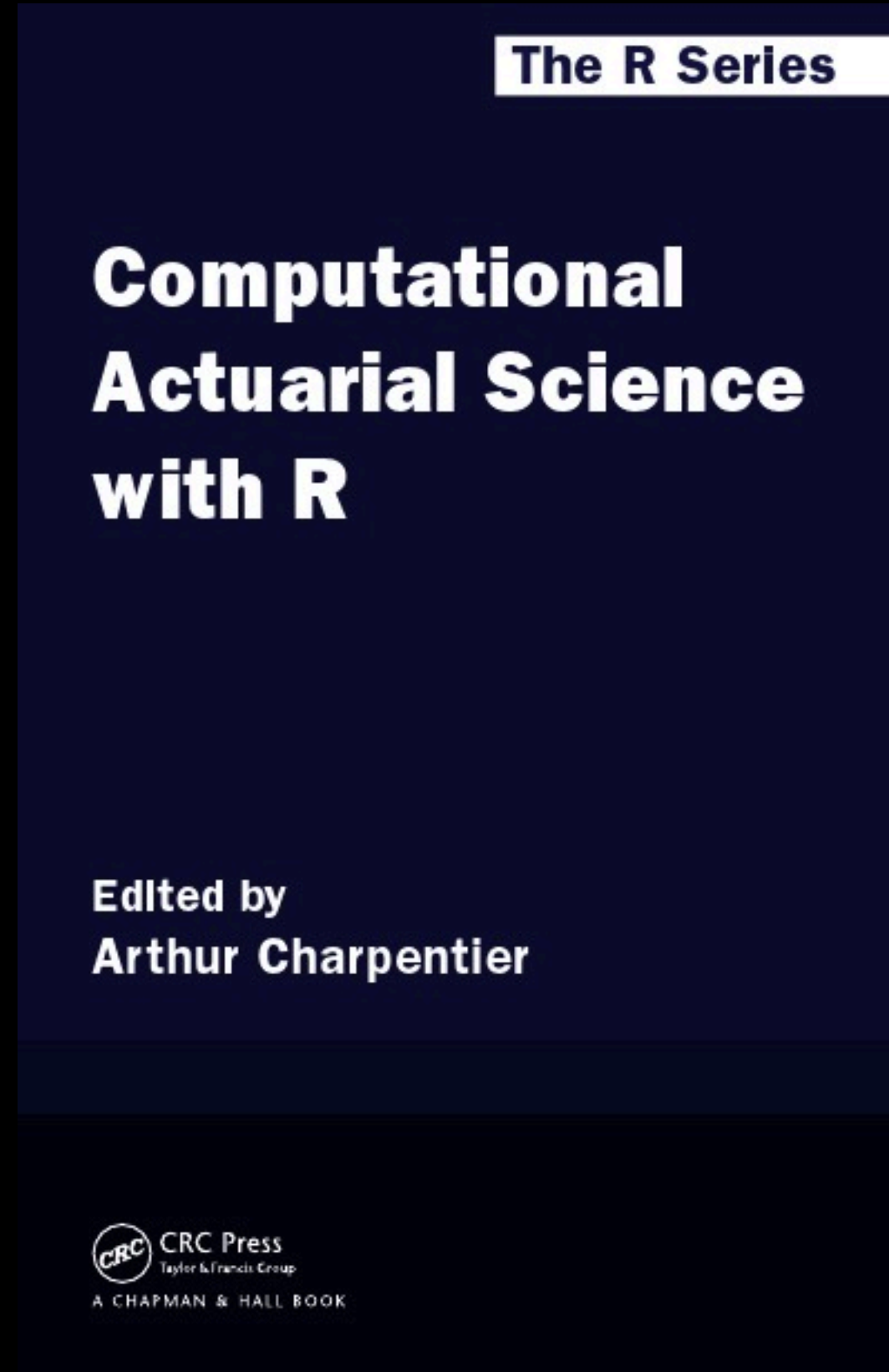
Source: Aon Benfield: Top 10 insured losses 2011

Source: Lloyd's, Global underinsurance research: <http://www.lloyds.com/news-and-insight/risk-insight/underinsurance-report>

Getting started

- **Using R in Insurance, Presentation at GIRO 2012**
- **R-SIG-Insurance**
- **actuar**: Loss distributions modelling, risk theory (including ruin theory), simulation of compound hierarchical models and credibility theory
- **ChainLadder**: Reserving methods in R
- **copula**: Multivariate Dependence with Copulas
- **cplm**: Monte Carlo EM algorithms and Bayesian methods for fitting Tweedie compound Poisson linear models
- **evir**: Extreme Values in R
- **fitdistrplus**: Help to fit of a parametric distribution to non-censored or censored data
- **lifecontingencies**: Package to perform actuarial evaluation of life contingencies

In the pipeline:



First R in Insurance Conference

Cass Business School
London

15 July 2013

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