The Scientific and Economic Rationale of Insurance Related Tools for Dealing with Damages Associated with Climate Change

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The Foundation of MCII

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- The Munich Climate Insurance Initiative was founded in April 2005 at Munich Re.
- Members: Representatives from
  Germanwatch
  International Institute for Applied System Analysis (IIASA)
  Munich Re and Munich Re Foundation
  Potsdam Institute for Climate Impact Research (PIK)
  Tyndall Centre
  United Nations University
  Worldbank
  Independent experts

Objectives of MCII

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- To facilitate insurance-related solutions to help deal with the impact of climate change
- To conduct and support pilot projects for the application of insurance-related solutions
- To promote insurance-related approaches in cooperation with other organizations and initiatives
- To identify and promote loss reduction measures for tackling climate related events

Hurricane Records in 2005

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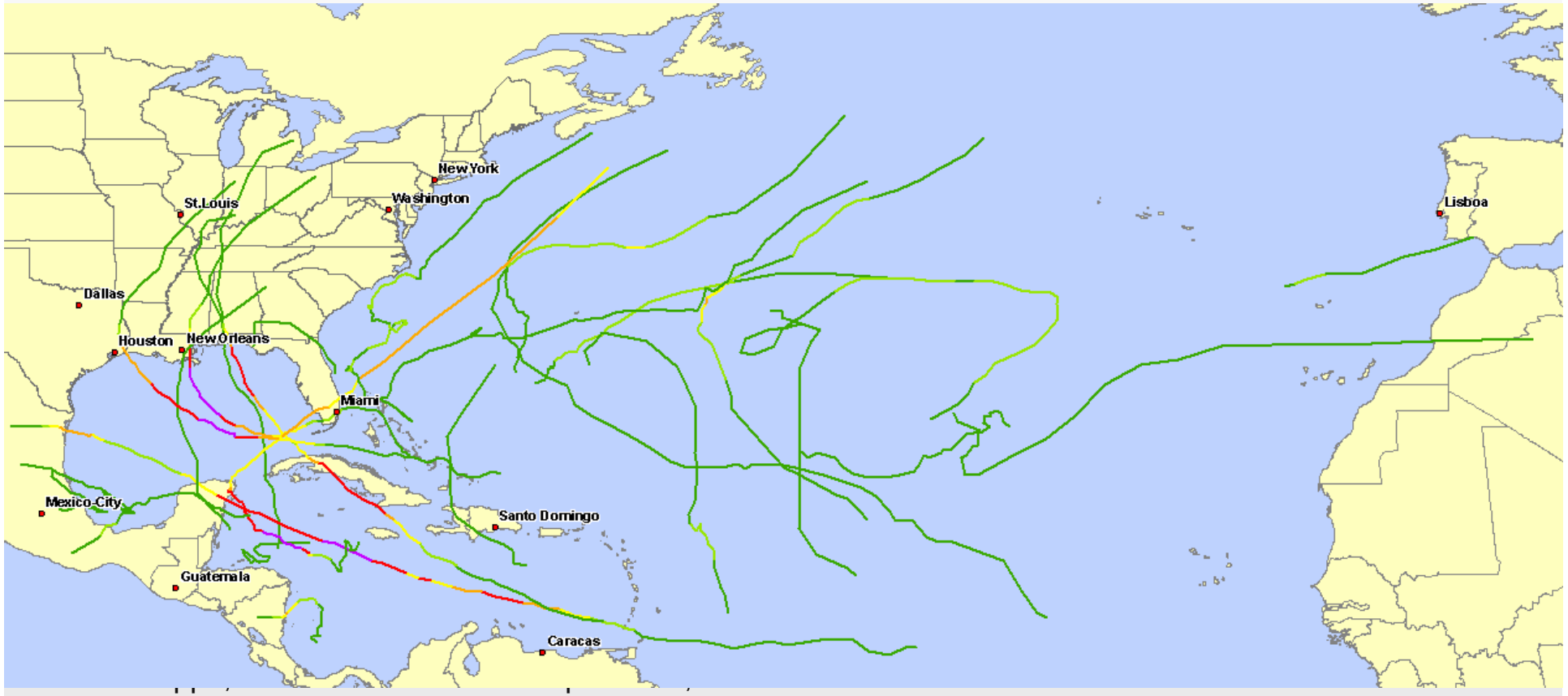
Never before since the beginning of records (1850) have so many named tropical storms occurred in the North Atlantic basin in one season:
27 (15 with hurricane strength); old record 21 (12).

Hurricane Wilma was the strongest, Rita the 4th strongest and Katrina the 6th strongest hurricane since beginning of records (1850)



Hurricane Vince (9 October 2005)

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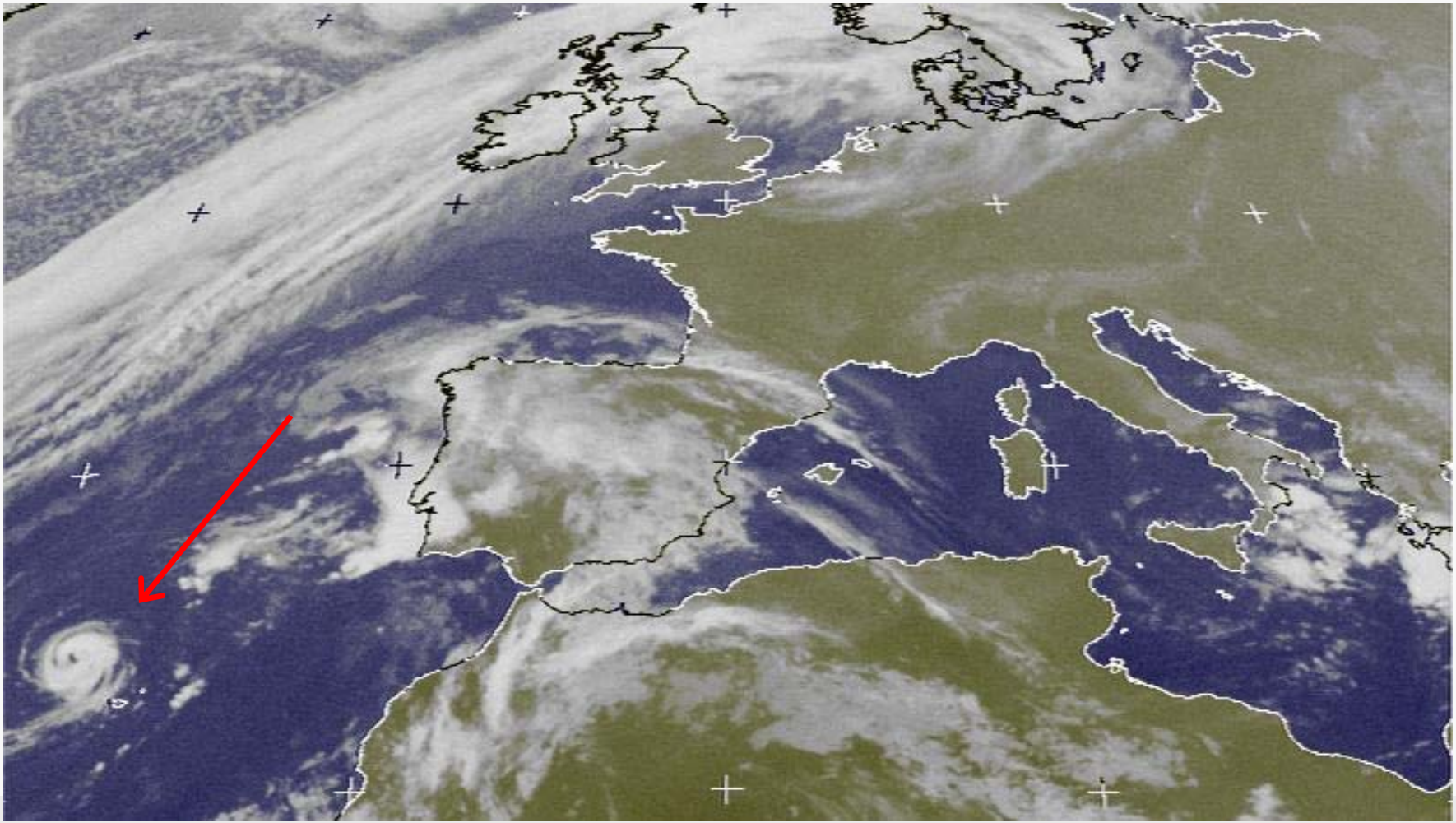
Vince, eastern and northern most hurricane ever, in a “hurricane free” region by then (close to Madeira)



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Tropical Storm Delta (27 November 2005)

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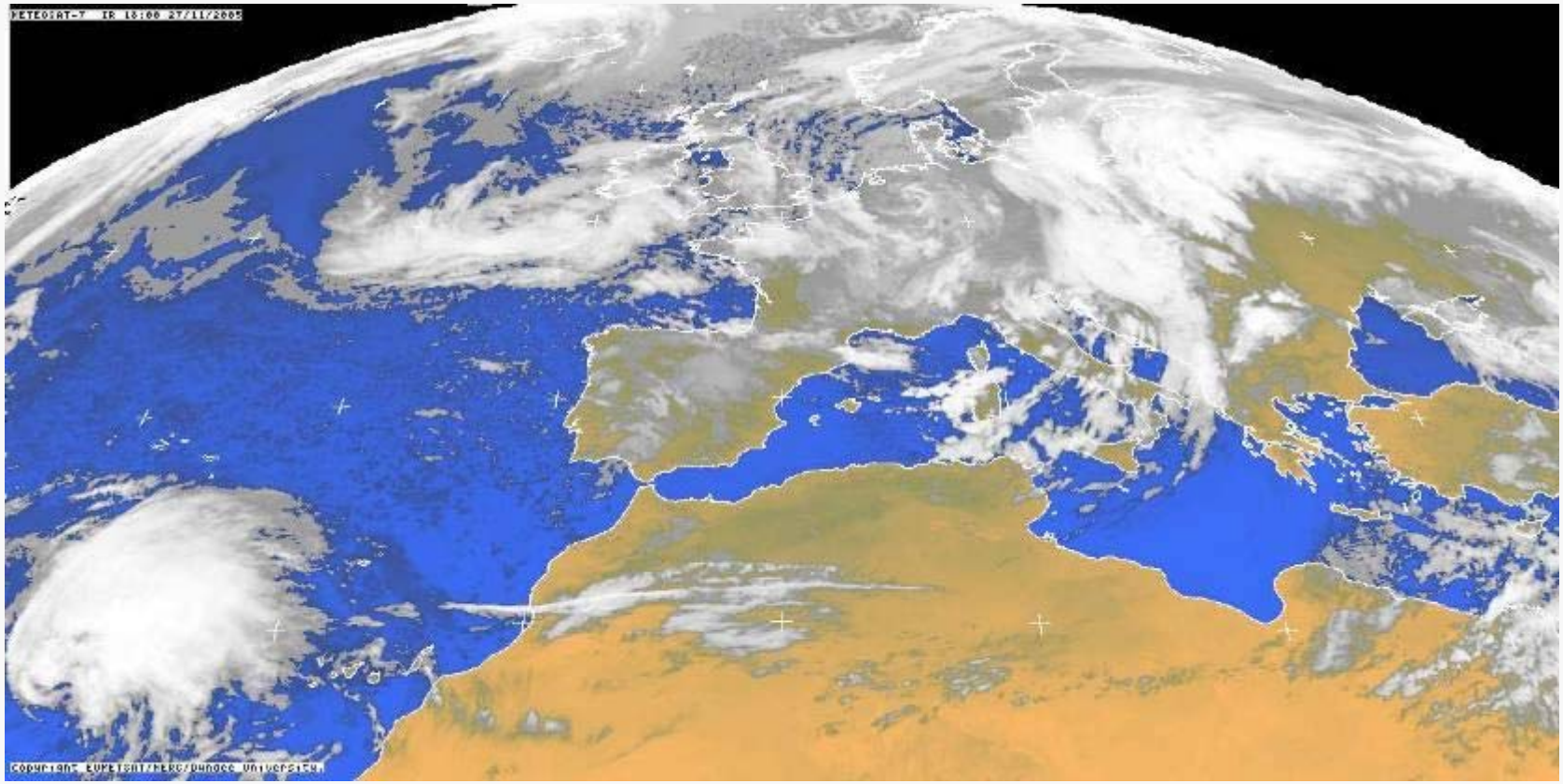
The first tropical storm to hit the Canary Islands and Morocco



Source: Delta Dundee University

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MR NatCat*SERVICE*®

One of the world‘s largest databases on natural catastrophes

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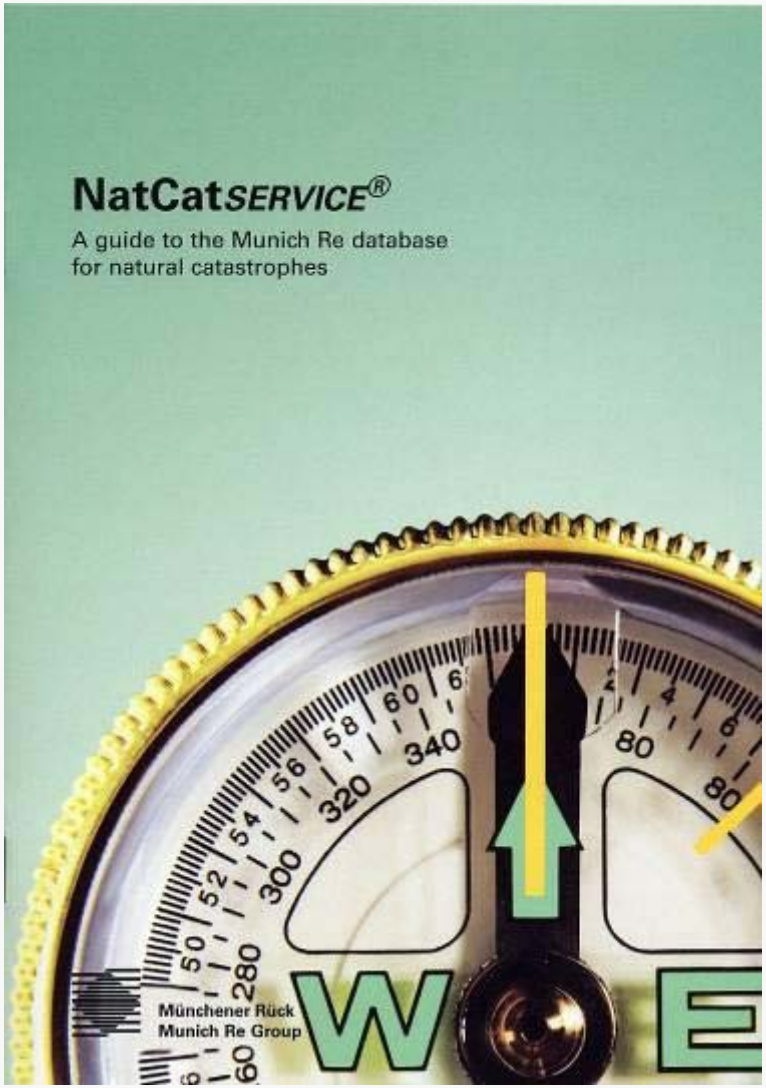

Information on natural catastrophes or loss events worldwide

- reflects the hazard situation worldwide
- documents more than 22,000 events
- is the basis of numerous analyses

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Great Natural Disasters 1950 – 2005

Number of events

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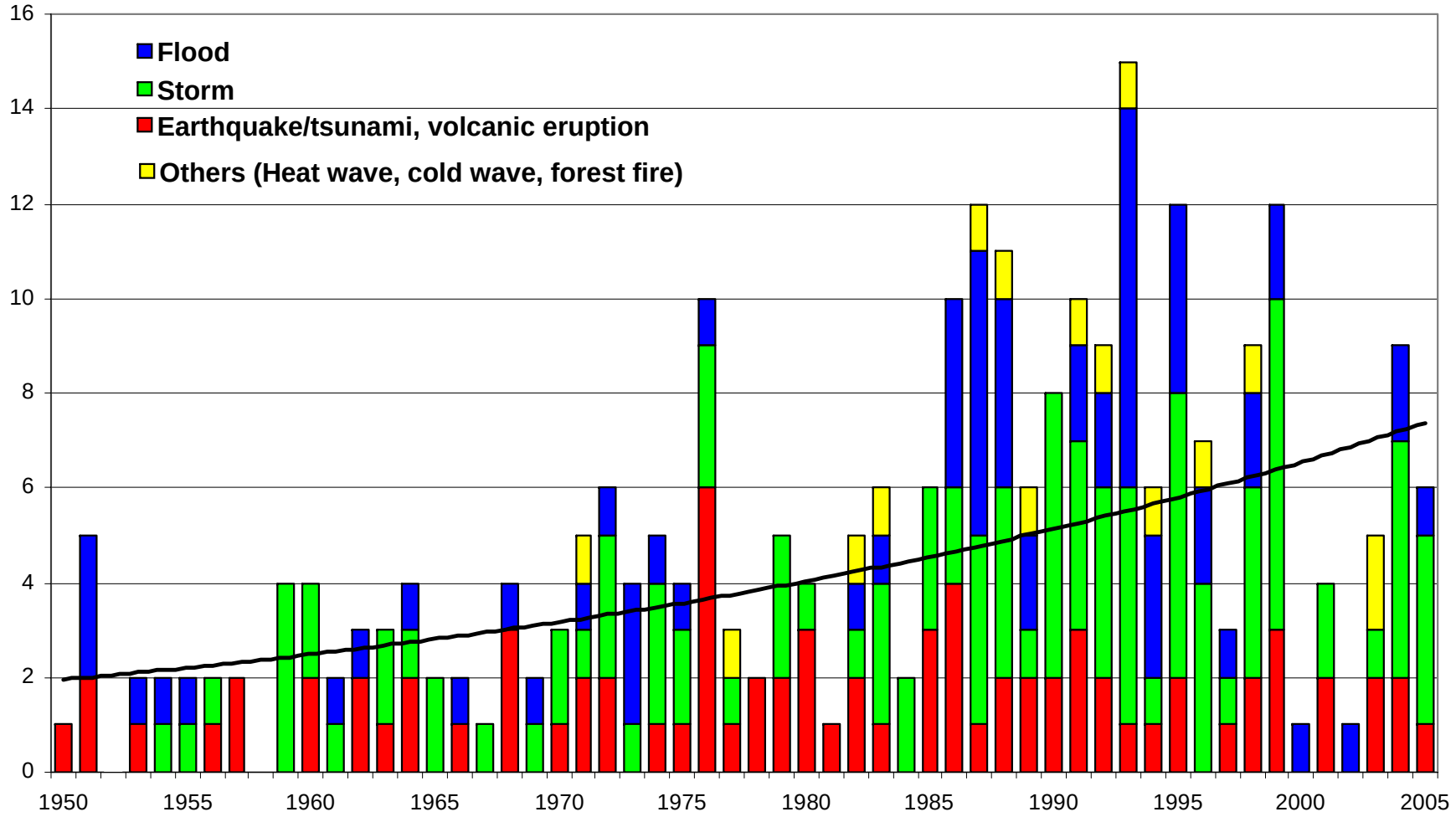

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Great Natural Disasters 1950 – 2005

Number of geological events

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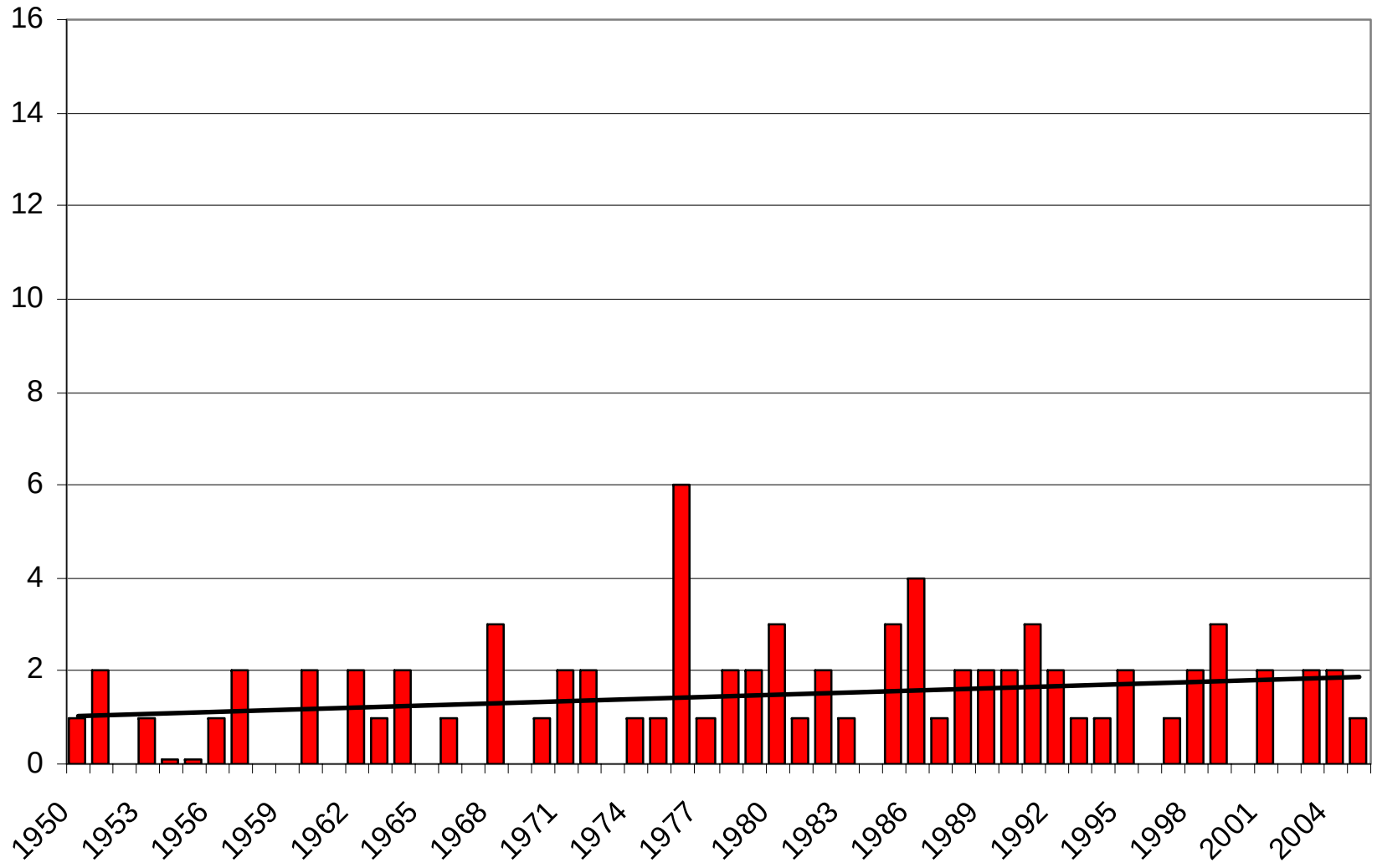

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Great Weather Disasters 1950 – 2005

Economic and insured losses

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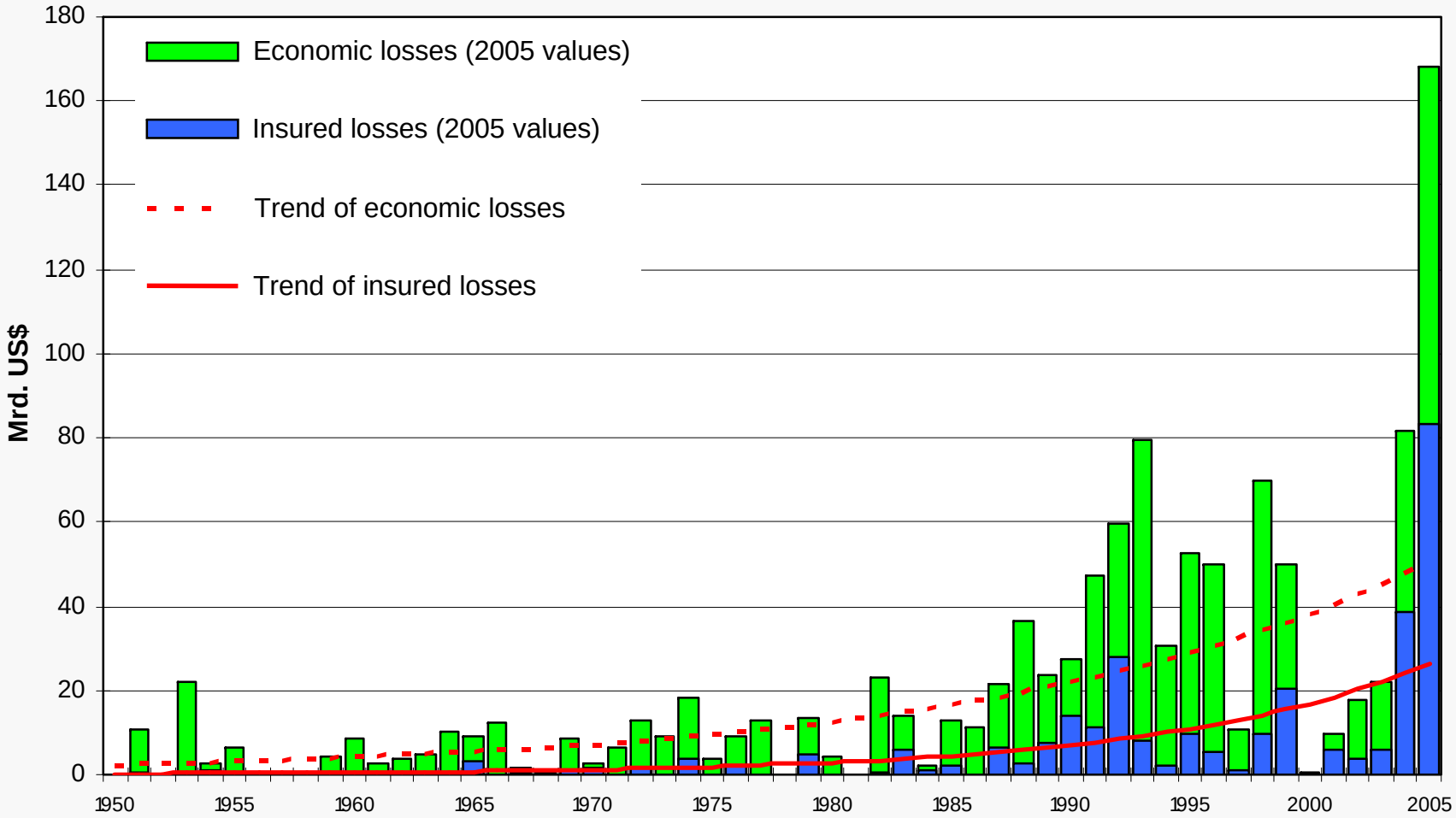

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Scientific evidence of a link between global warming and extreme weather events

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- Human influence has already at least doubled the risk of a heat wave like 2003 in Europe (Stott et al., Nature 2004).
- Climate models predict intensification of hurricanes (Knutson et al., J of Climate 2004).
- Major tropical storms both in the Atlantic and the Pacific region have already increased since the 1970s in duration and intensity by about 50 percent (Emanuel, Nature 2005; Webster, Science 2005)
- Due to climate change the sea surface temperatures have increased already by 0.5°C (Barnett, Pierce, 2005, Science; Santer et al., PNAS, Sept. 2006)
- Of all the factors that drive a tropical storm only the steady increase in sea surface temperatures over the last 35 years can account for the rising strength of storms in six ocean basins around the world (Hoyos et al., Science 2006)

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Changes in Sea Surface Temperatures

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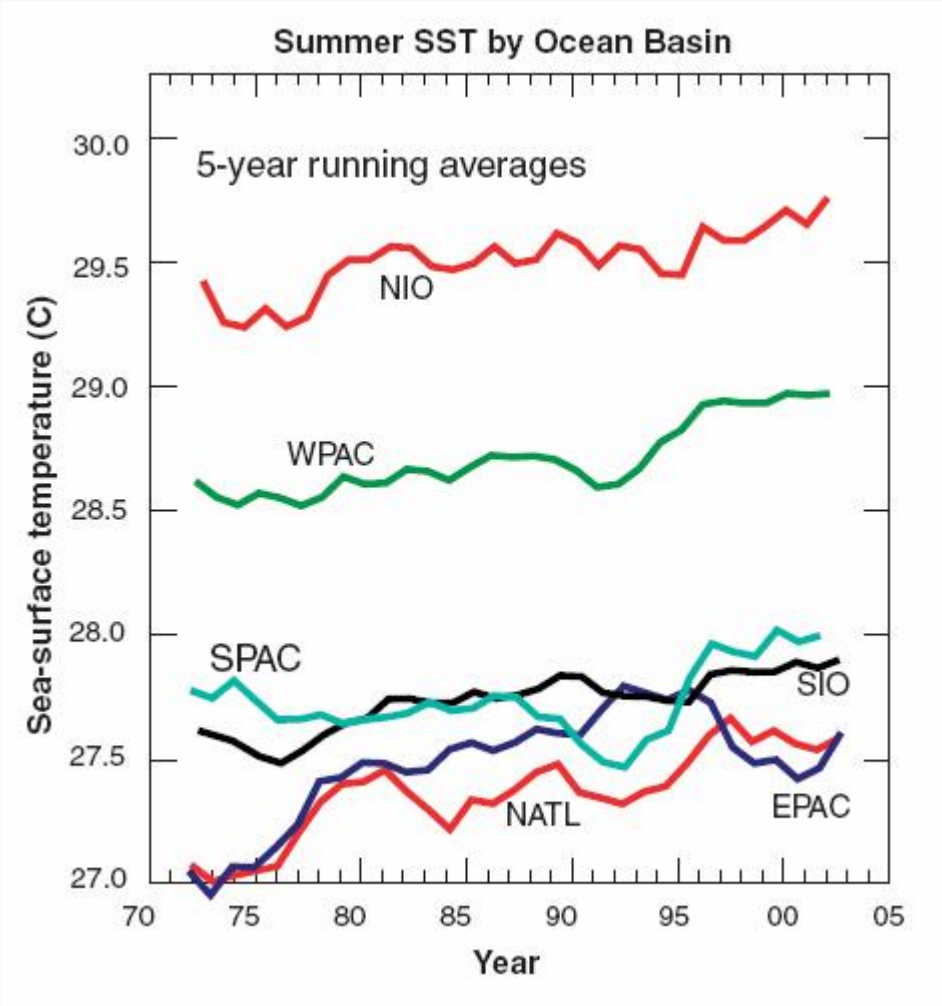

NATL = North Atlantic

WPAC = West Pazific
SPAC = South Pazific
EPAC = East Pazific
NIO = Northern Indic
SIO = Southern Indic

Source: Webster et al. (2005), Science Vol. 309.

Mean annual normalized US hurricane losses in dependence on SST-anomalies

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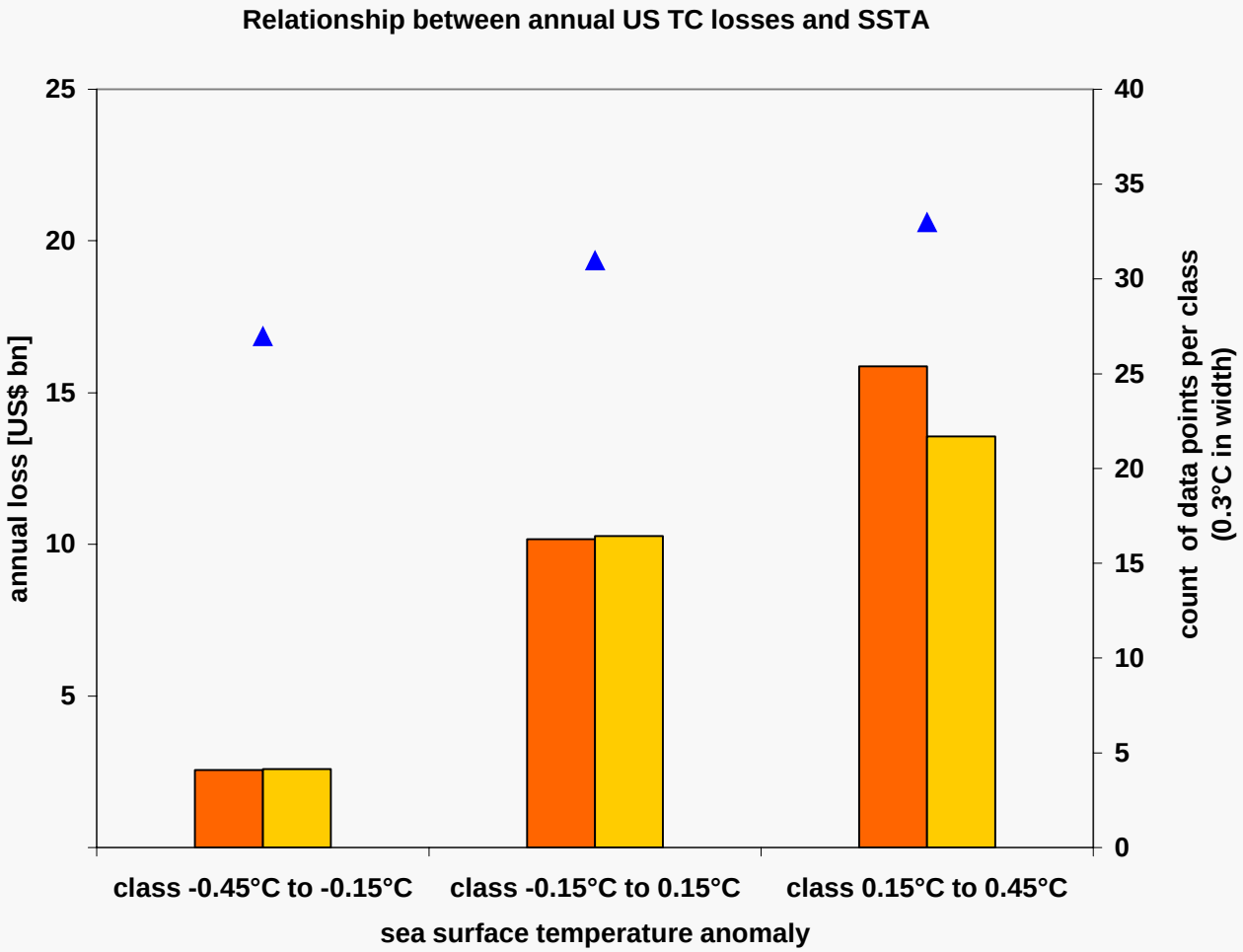
Yellow bars: mean annual losses according to R. Pielke

Orange bars: since 1954 Munich Re's annual loss figures were used

Blue triangles: number of data points per class (right-hand axis).
Source: Faust, Munich Re 2006, work in progress.



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Natural catastrophes in economies at different stages of development between 1980 and 2005

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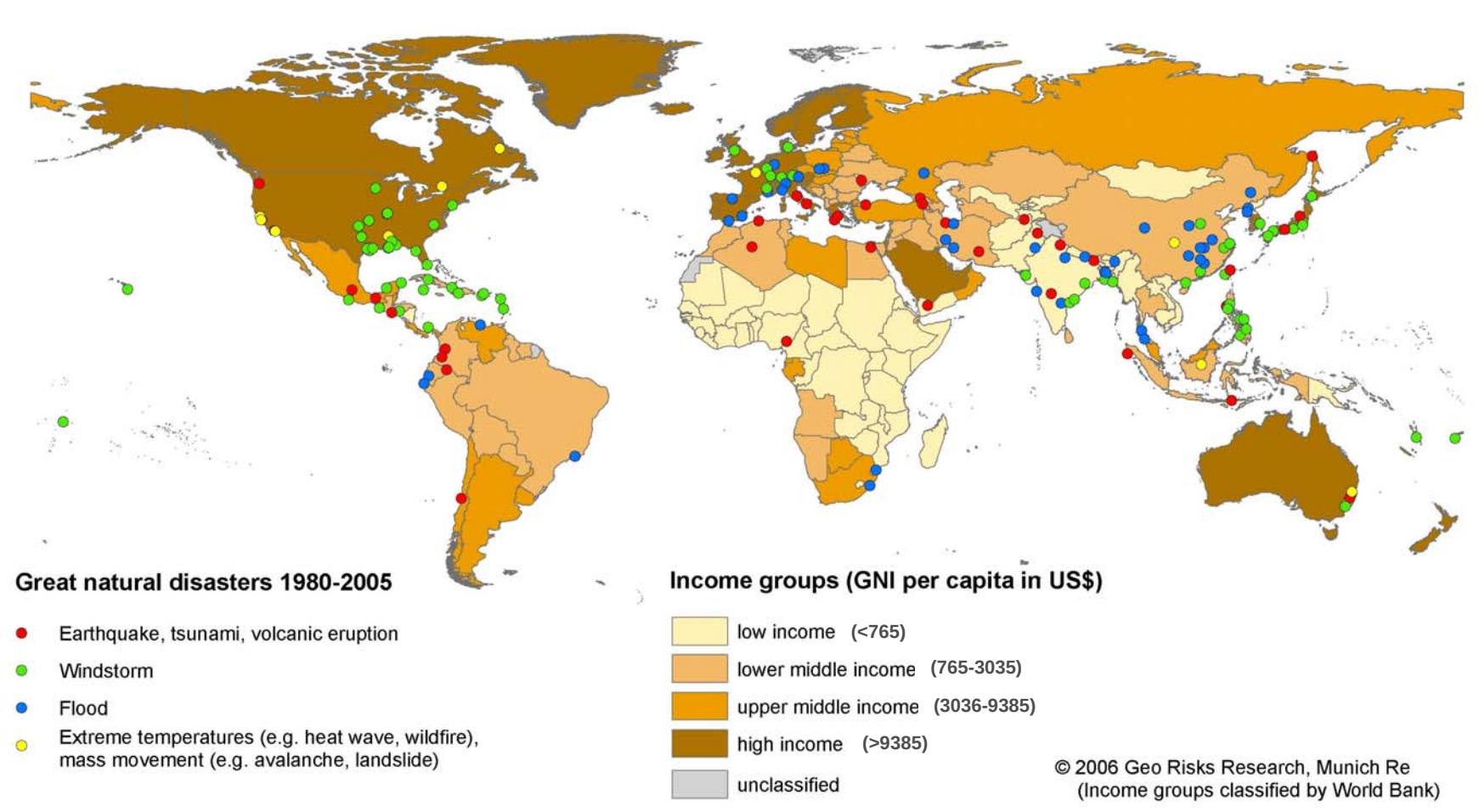

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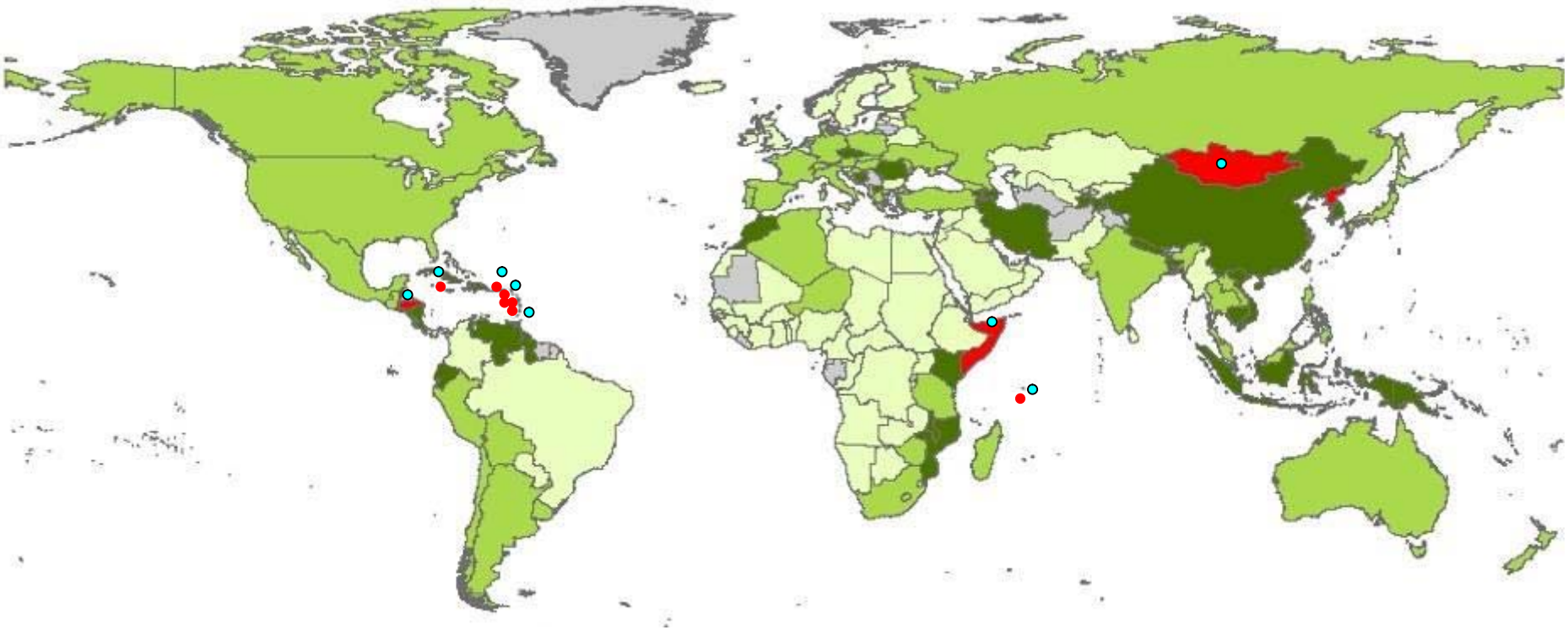
Average of total losses per unit GDP in % caused by weather-related loss events (1995 – 2004)



Average total losses per unit GDP in % 1995 – 2004 (average number of events):

Rank			Rank		
1	Seychelles	32.4 (0.2)	6	Korea, DR (North)	15.9 (2.3)
2	Cayman Islands	25.3 (0.5)	7	St. Kitts and Nevis	14.2 (0.4)
3	Grenada	24.2 (0.2)	8	Somalia	12.6 (2.2)
4	Mongolia	17.8 (1.5)	9	Dominica	8.0 (0.4)
5	Virgin Islands (USA)	17.0 (0.5)	10	Honduras	7.1 (2.7)

Rank

- 1 - 10
- 11 - 50
- 51 - 100
- > 100
- Not specified

Down 10 countries where more than 90% of losses were caused by one individual event

Development of weather catastrophes 1980 - 2004 in economies at different stages of development

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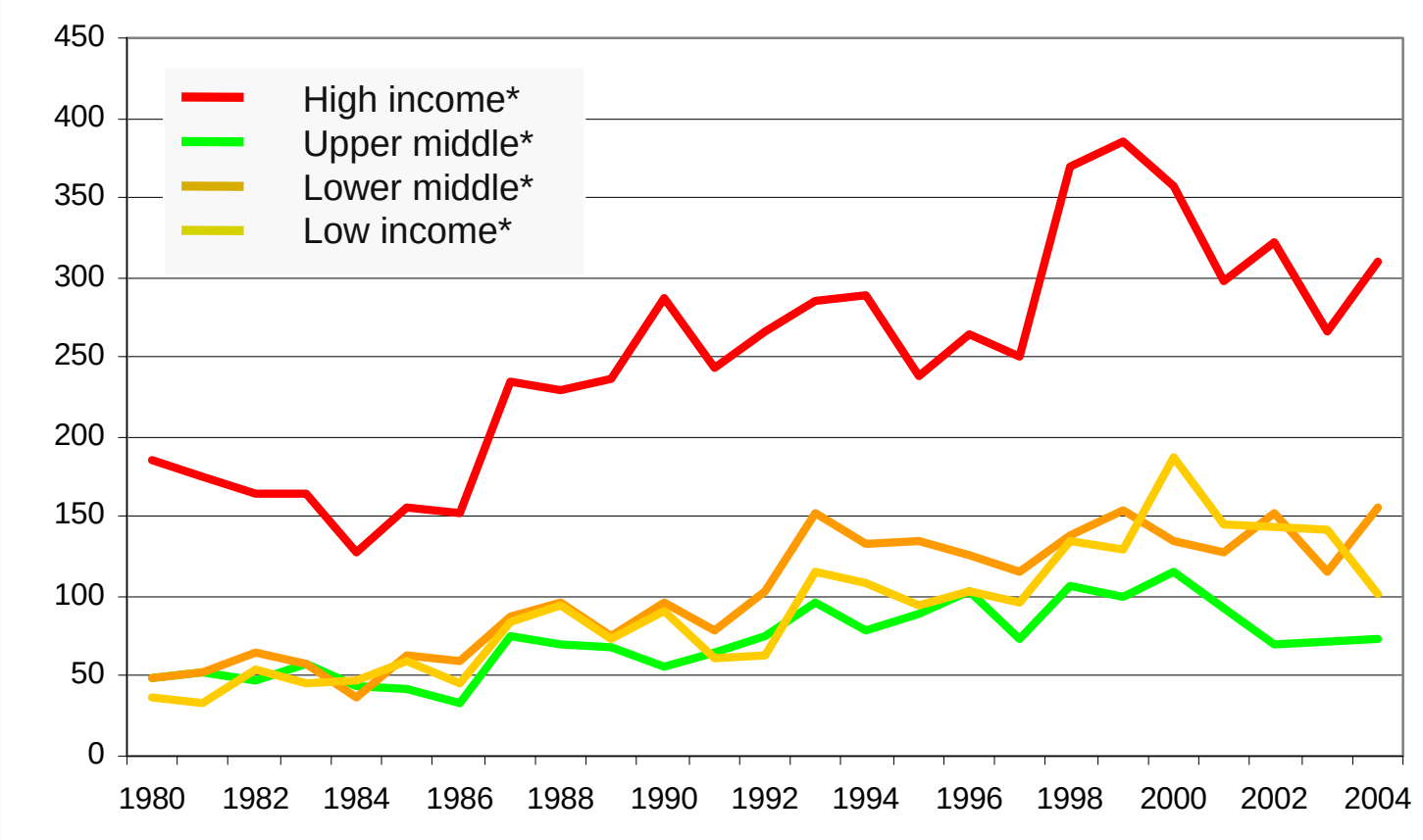
Number of events



*Classification as per World Bank, 2004

GDP per capita > 9385 US$
GDP per capita > 3036 - 9385 US$
GDP per capita > 765 - 3035 US$
GDP per capita < 765

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Global distribution of insurance premiums per capita

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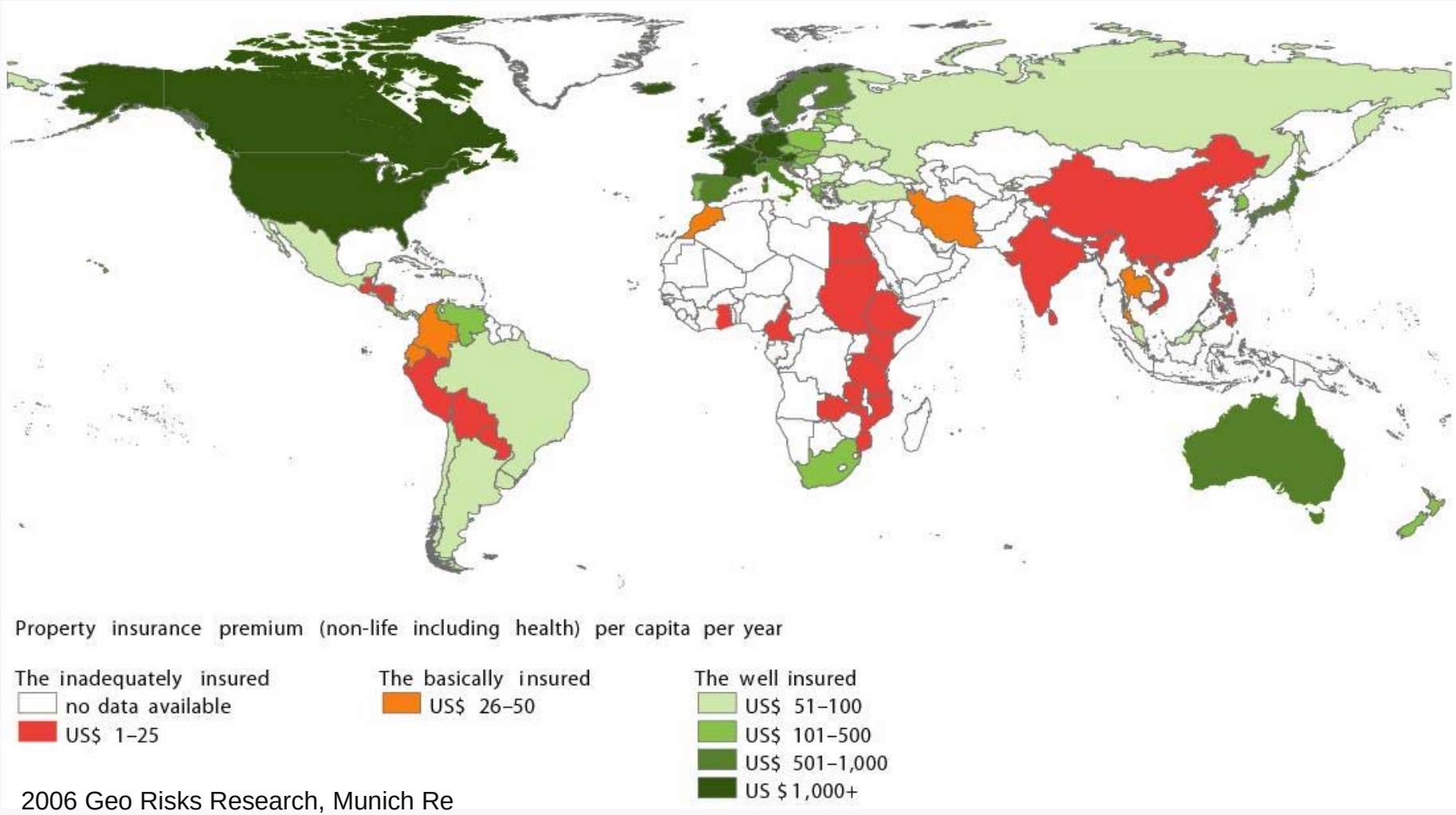

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Limitation for Donor Aid

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Donor aid has been a major source of risk financing for most disaster-prone developing countries. Over-reliance on this source of funding however has also major limitations:

- Donor aid is not a contractual obligation -> subject to considerable political uncertainty
- The amount of overall donor aid remained rather stable overtime as a percentage of donor countries' GDP
- Increasing ratios of donor aid have to be used for disaster relief rather than for development projects
- The ability of international donors to provide sufficient post-disaster financial assistance to disaster-prone nations in the future becomes a major suspect

Conclusions

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- There is no doubt anymore that climate has been changing already and will do so even faster in the near future
- The Munich Re NatCatSERVICE data show significant trends to increasing numbers of weather related disasters worldwide and the losses caused by them
- Recent scientific studies provide more and more evidence that there is a causal link between global warming and increasing natural catastrophe hazard
- In reference to the findings above we have to expect more weather related losses in the future

Conclusions contd.

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- While the wealthy countries will be able to cope with the increasing losses from extreme weather events by means of insurance solutions and state funding, the poorest countries will suffer most

- The increasing natural catastrophe damages in poor countries will consume increasing ratios of the donor money of development funding, delaying their further development

- New insurance related systems are necessary to get these countries, where currently almost no insurance is available, out of the global warming trap

- MCII intends to provide expertise on insurance solutions for losses due to climate change especially in developing countries

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Thank you for your interest!