Global Warming – from an Insurance Risk of Change to a Commitment to Climate Protection and Adaptation

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Geo Risks Research
Munich Reinsurance Company

Münchener Rück
Munich Re Group

Geo Risks Research Department of Munich Re - Analyses of natural disasters since 1974

Dresden, August 2002
Economic losses €16 bn

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Heat wave of 2003, the largest humanitarian natural catastrophe in Europe for centuries

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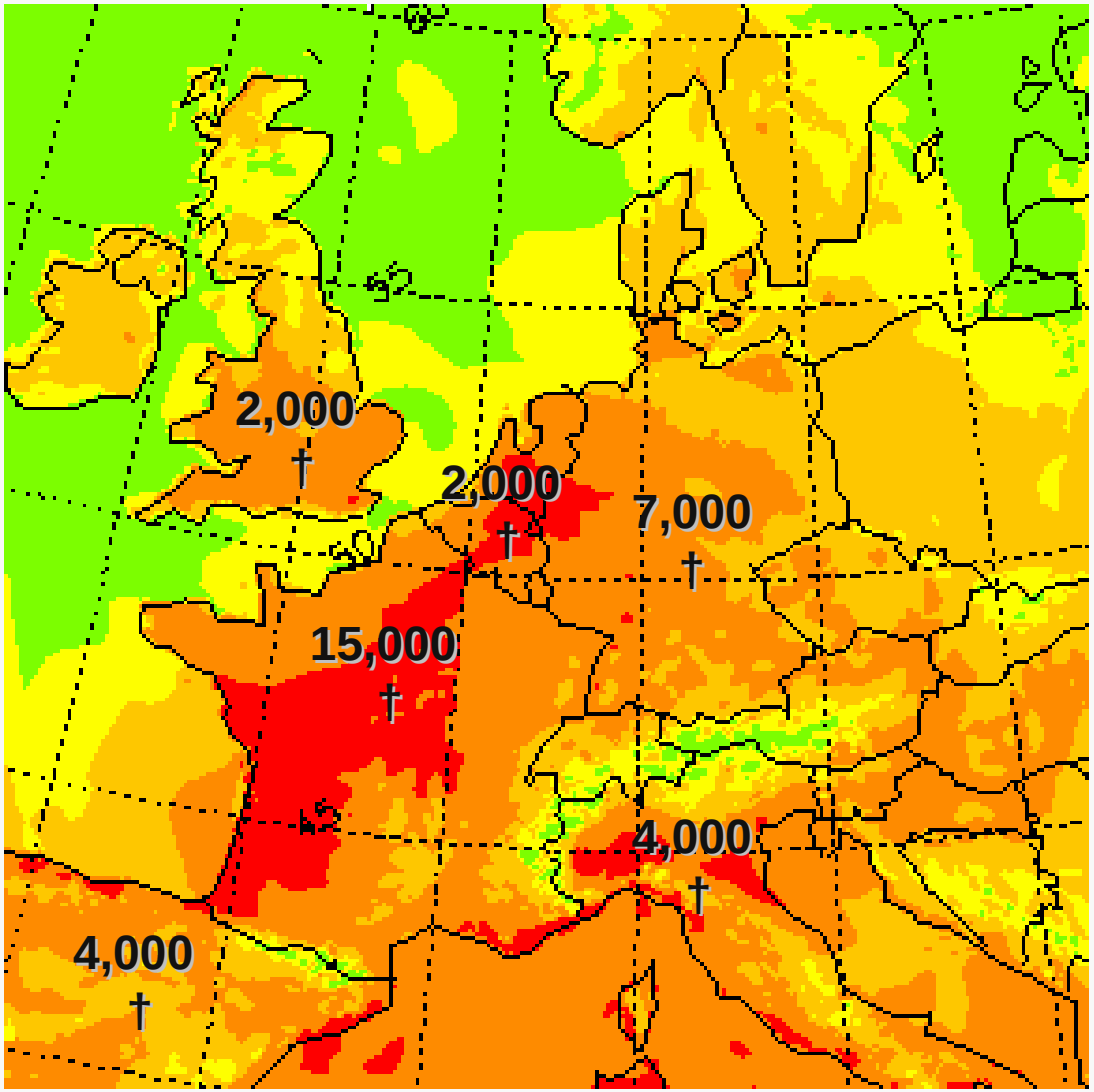
Perceived Temperature on 8 August 2003 and excess mortality



Source: German Weather Service, 2004

Heat stress

Cold stress

UTC
13:00

Record Hurricane Season 2004 in the Caribbean and Florida

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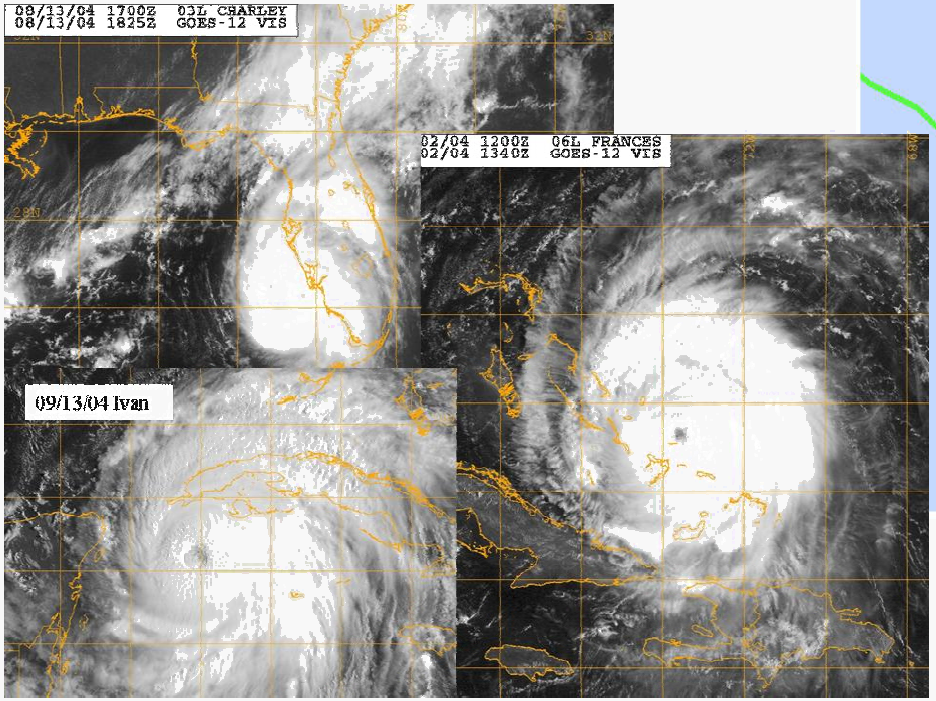
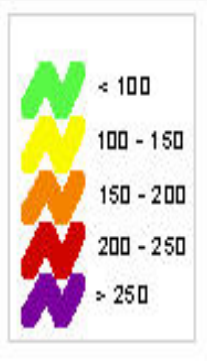
Overview of the four hurricanes in 2004 causing the greatest losses



Wind speed in gusts (km/h)



Loss balance, total of all 4:

Total economic loss: US$62 bn

Insured market loss: US$31 bn

2004: 1st Hurricane in South Atlantic

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Hurricane Catarina off the Coast of Brasil, March 2004

Source: Image courtesy of Earth Sciences and Image Analysis Laboratory, NASA Johnson Space Center, Bild-Nummer ISS008-E-19646. http://eol.jsc.nasa.gov

Weather records 2005

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On 26th July 2005 the meteorological station at Santacruz in North Mumbai (India) recorded 944 mm of rainfall within 24 hours, the highest ever in the history of precipitation recordings in India.

Never before since the beginning of records (1850) have so many (7) named tropical storms occurred in the North Atlantic basin until end of July, by 1 December already 26 (absolute record for whole season 21).

Hurricane Katrina was the 6th strongest hurricane since beginning of records, in terms of economic losses the largest, estimates currently are at more than US$125 bn (insured >US$35 bn).

Hurricane Katrina (29 August 2005)

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New Orleans

Hurricane Rita (24 September 2005)

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Hurricane Rita was the 4th strongest since start of records, economic losses ca. US$ 15 bn, insured ca. US$ 8 bn.

Hurricane Stan (3 October 2005)

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Hurricane Vince (9 October 2005)

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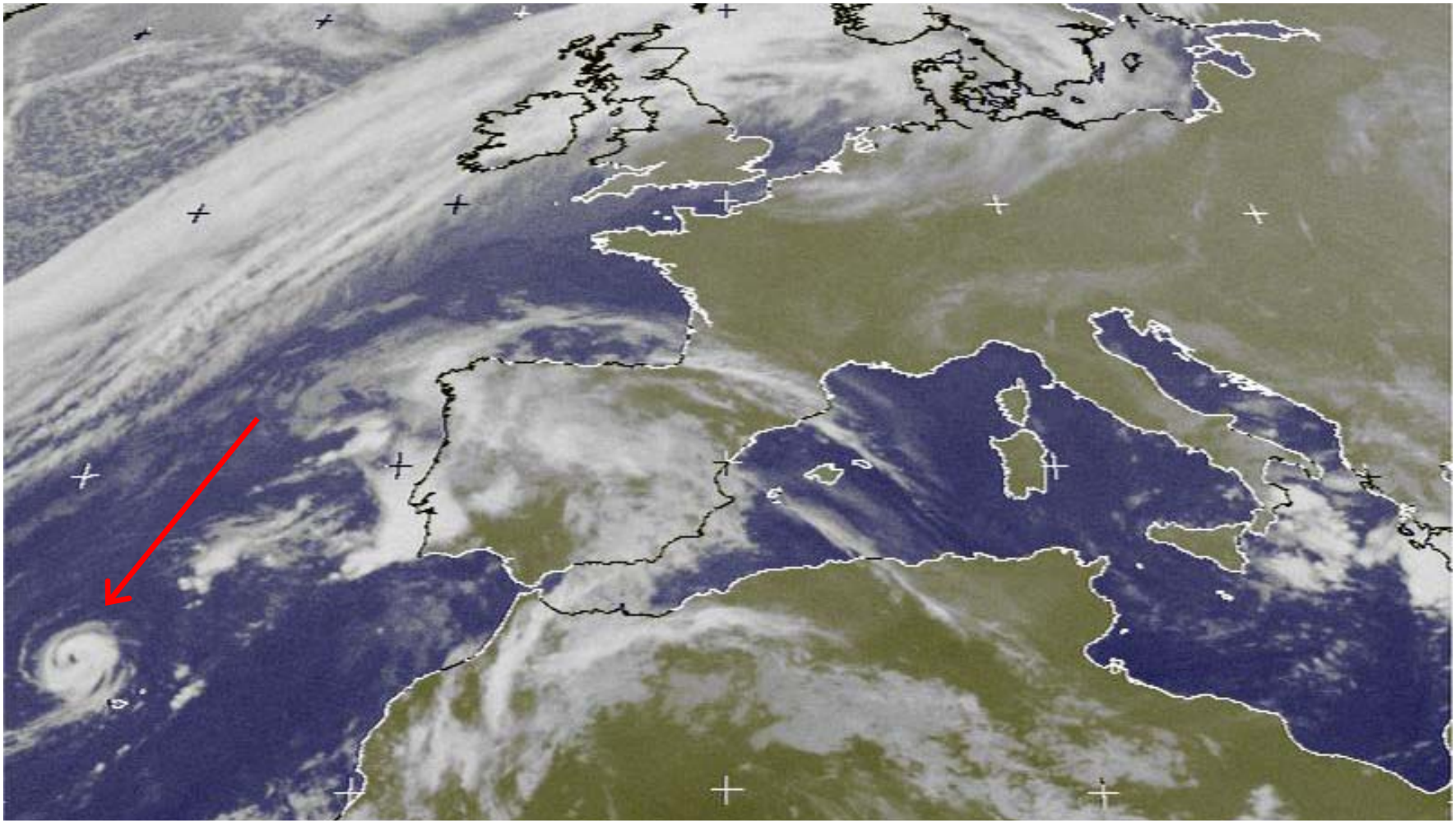
Vince, eastern and northern most hurricane ever, in a “hurricane free” region by then (close to Madeira)



Hurricane Wilma (21 October 2005)

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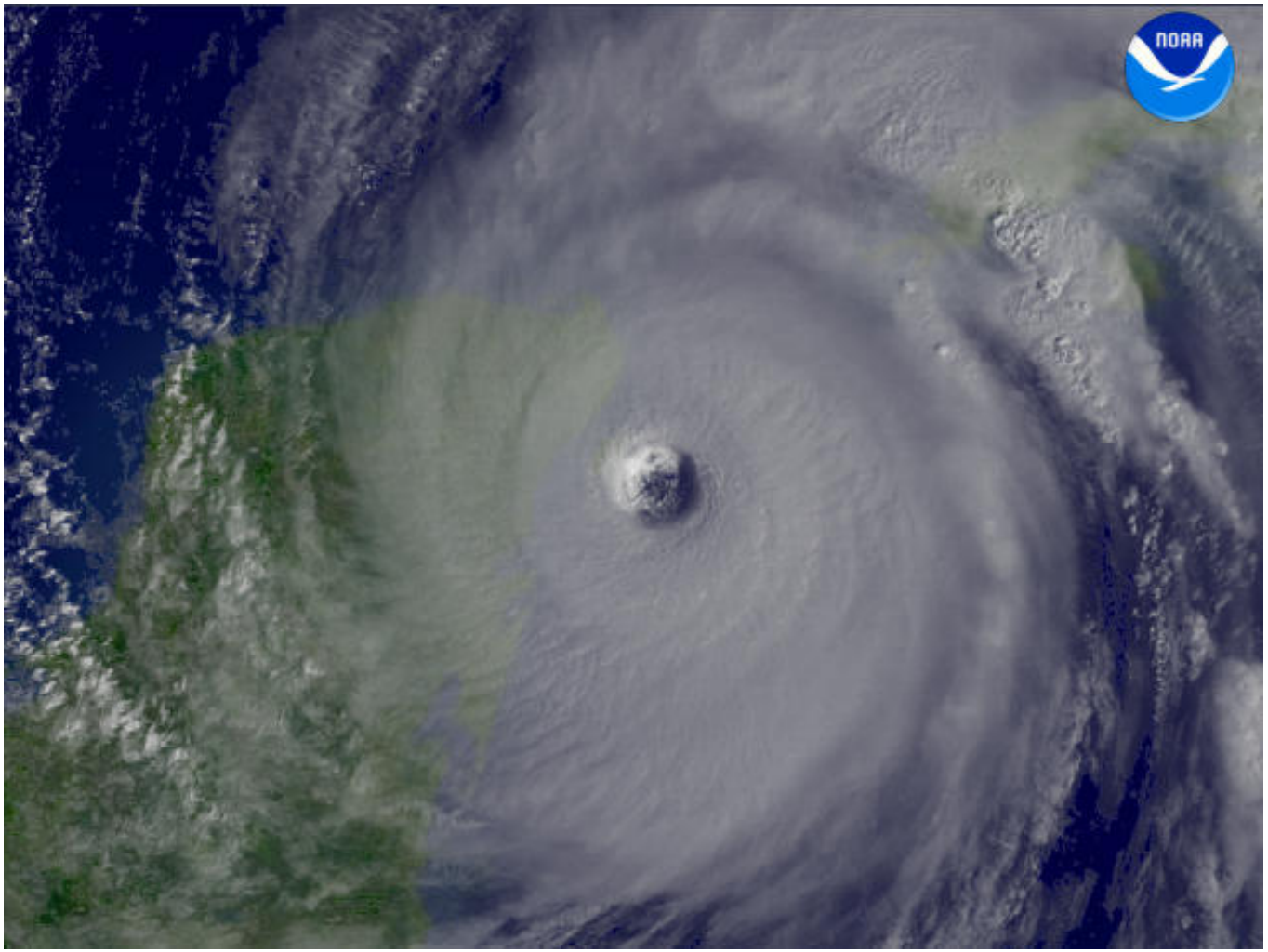
Hurricane Wilma was the strongest hurricane ever, economic losses US$15 bn, insured US$10 bn



Tropical Storm Delta (27 November 2005)

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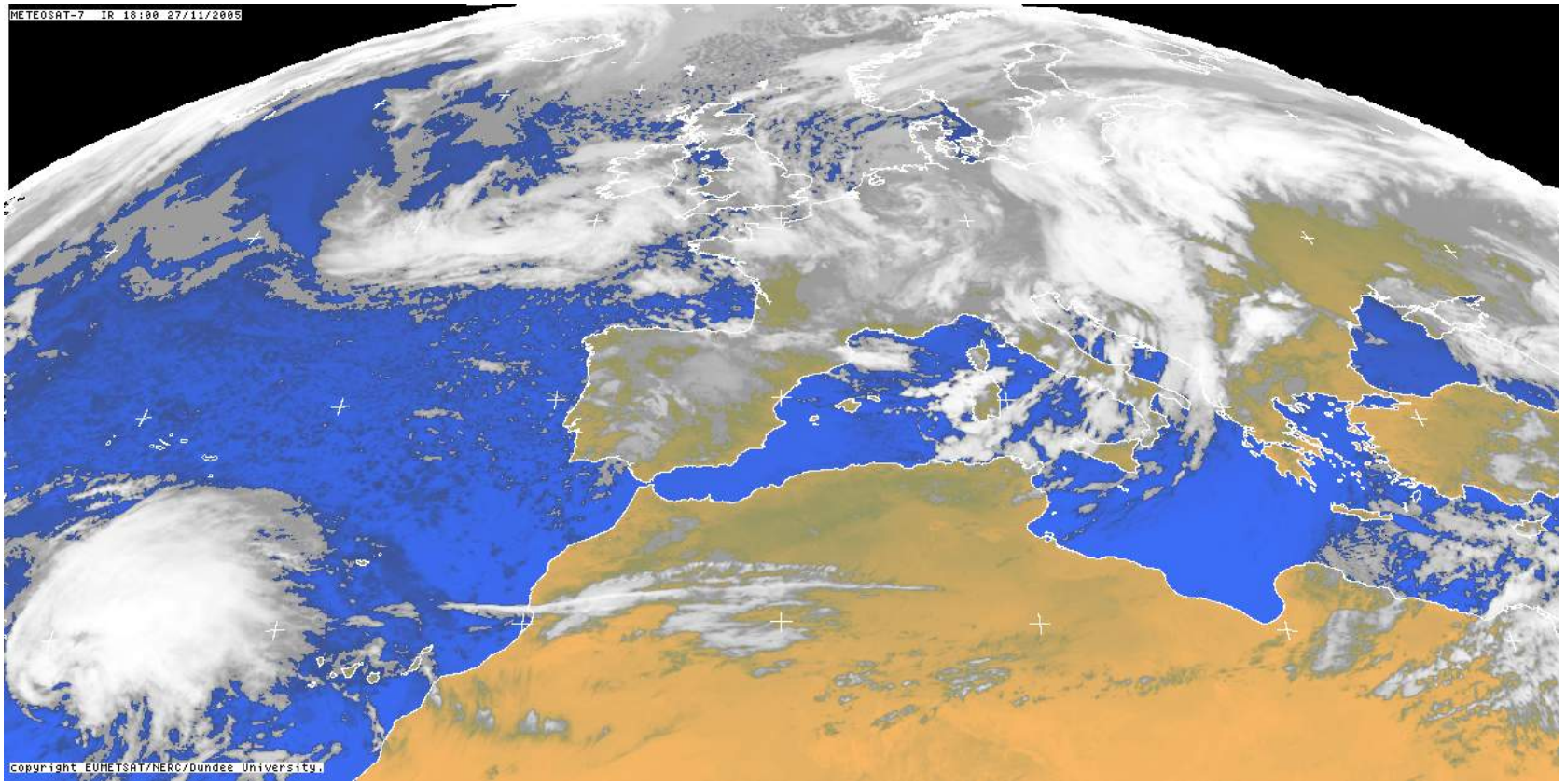
The first tropical storm to hit the Canary Islands



Source: Delta Dundee University

Great Natural Disasters 1950 – 2005

Number of events

(as at November 30, 2005)

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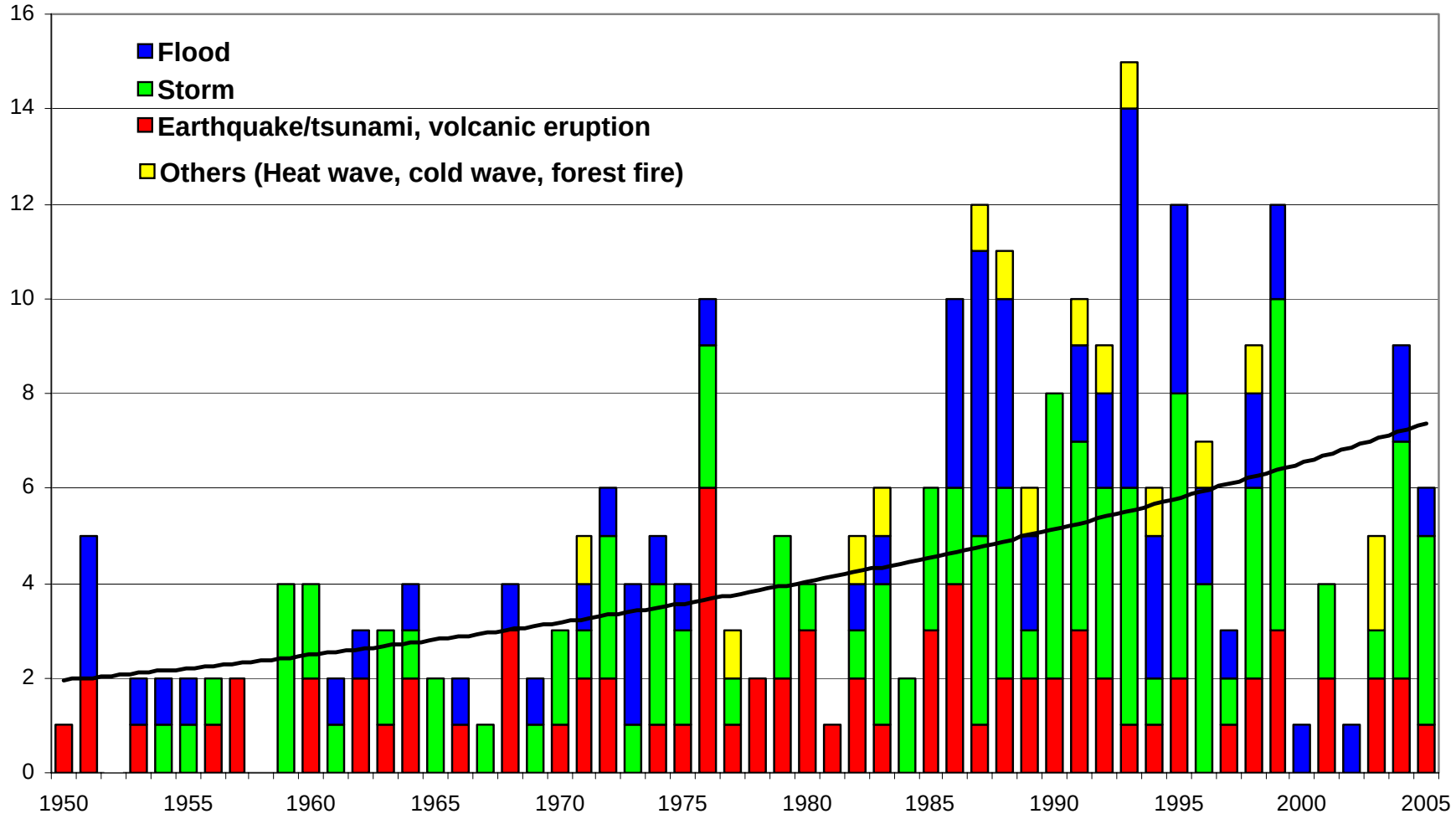

Great Natural Disasters 1950 – 2005

Number of geological events
(as at November 30, 2005)

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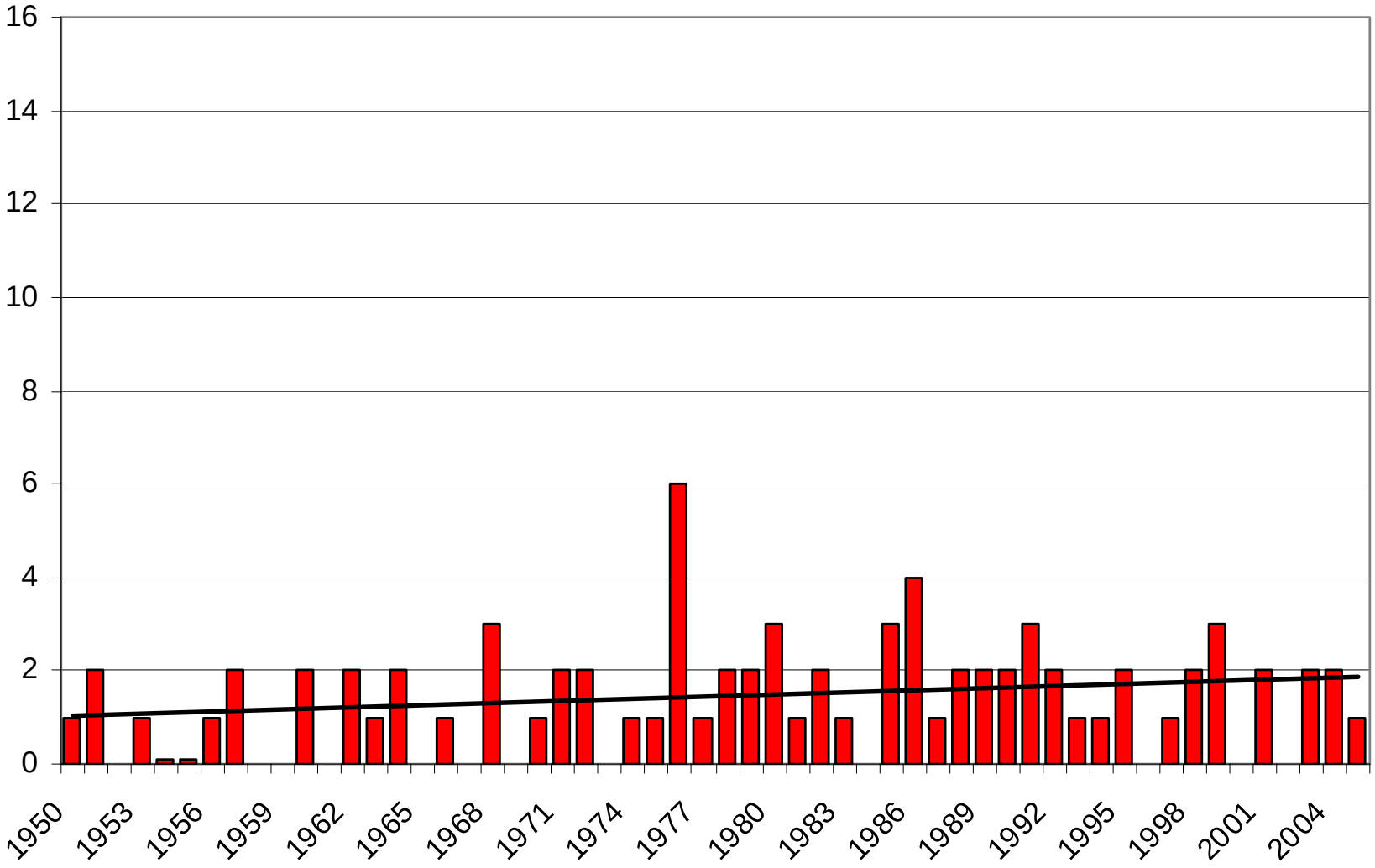

Great Weather Disasters 1950 – 2005

Number of weather related events
(as at November 30, 2005)

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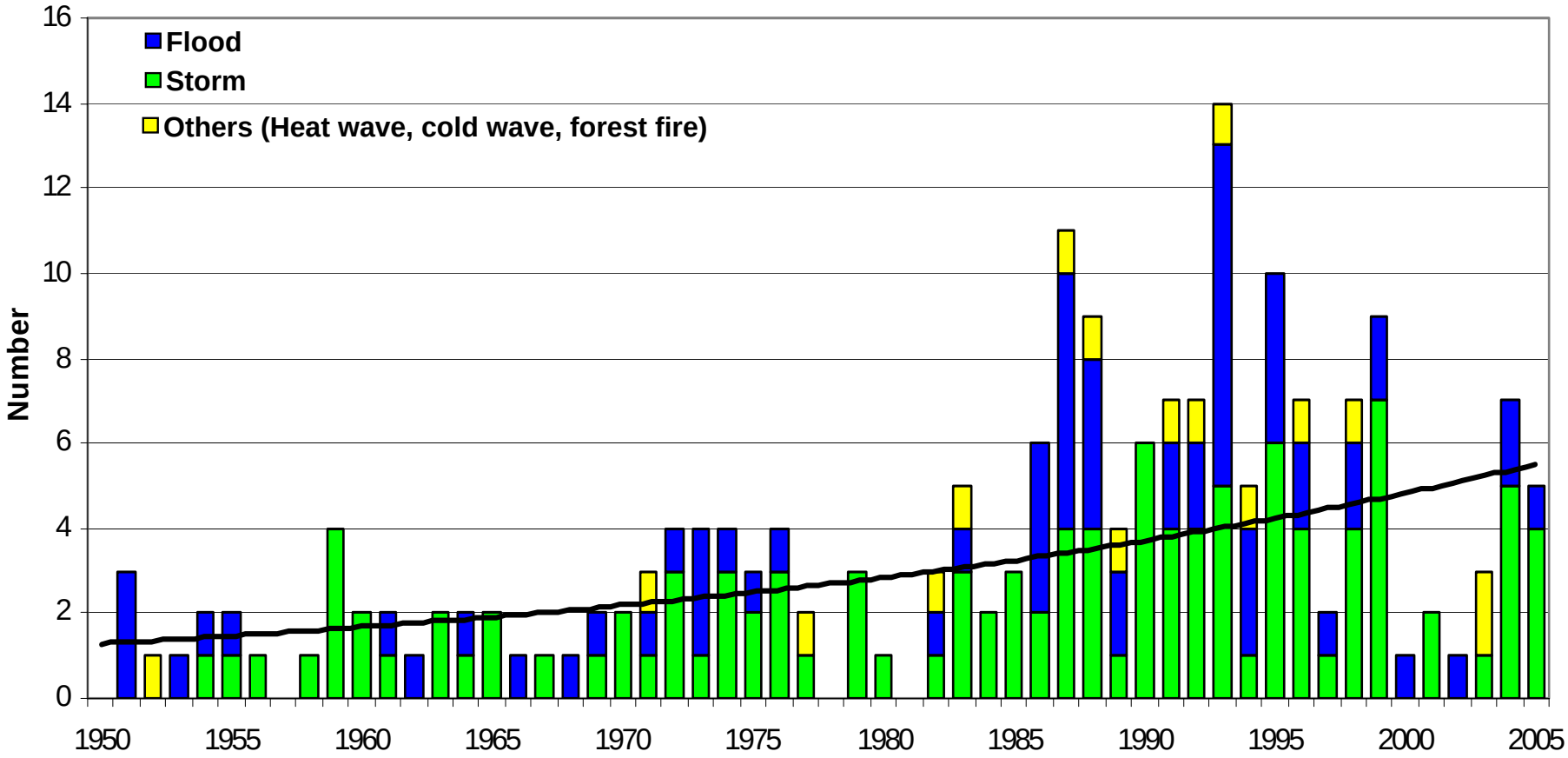

Great Weather Disasters 1950 – 2005

Economic and insured losses
(as at November 30, 2005)

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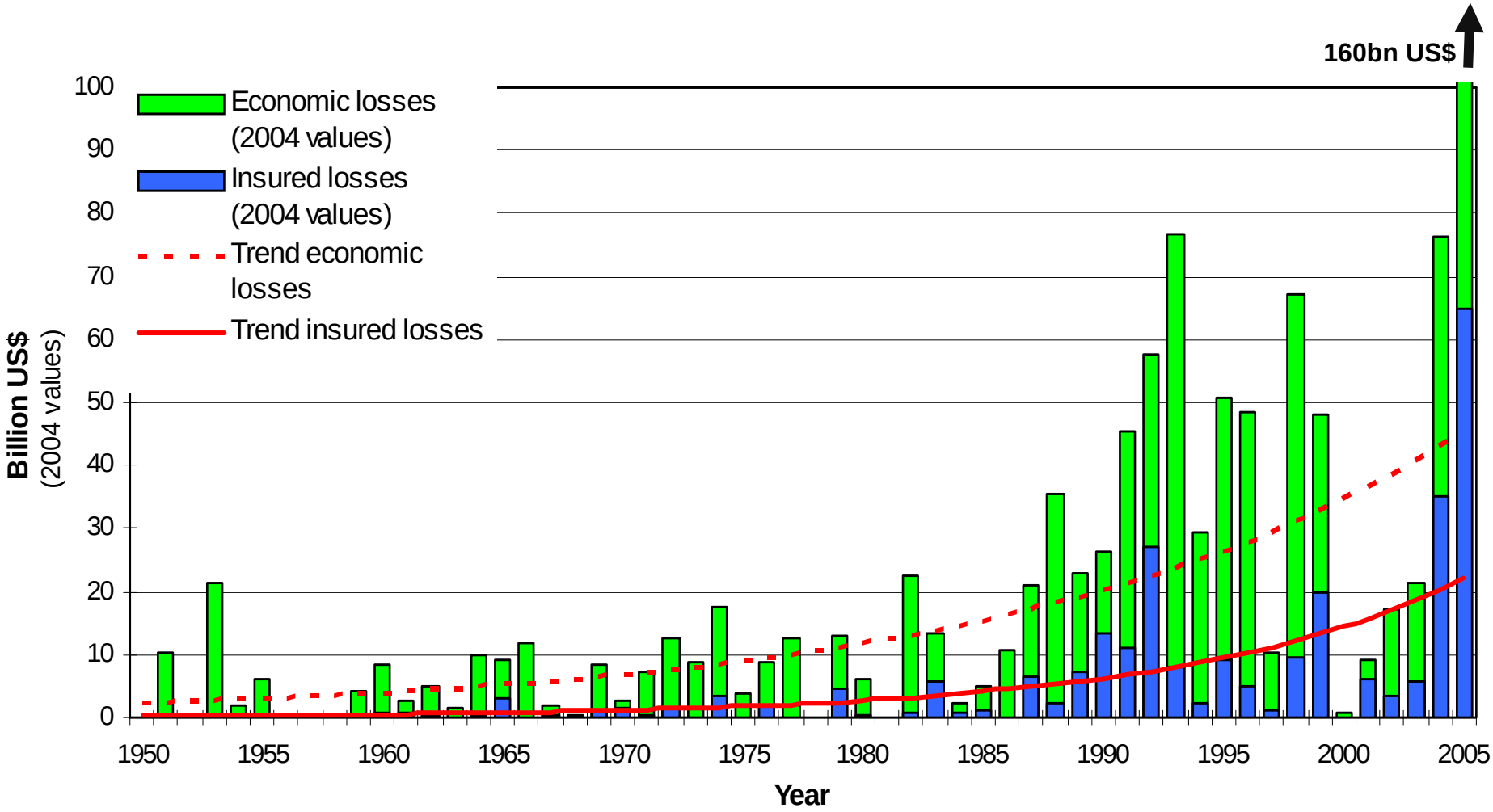

The Scientific Evidence

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- Climate change will intensify the maximum wind speed by 0.5 on the Saffir Simpson scale and precipitation by 18% in hurricanes until 2050 (Knutson et al., 2004).
- It is very likely (confidence level >90%) that human influence has already at least doubled the risk of a heat wave exceeding the magnitude of the European heat wave 2003 (Stott et al., 2004).
- Due to climate change the sea surface temperatures have increased already by 0.5°C (Barnett, Pierce, 2005, Science)
- 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. The projections are, that this trend induced by global warming will continue in the future (Emanuel, Nature 2005; Webster, Science 2005)

PDI for the North Atlantik
compared to September sea surface temperature (SST)

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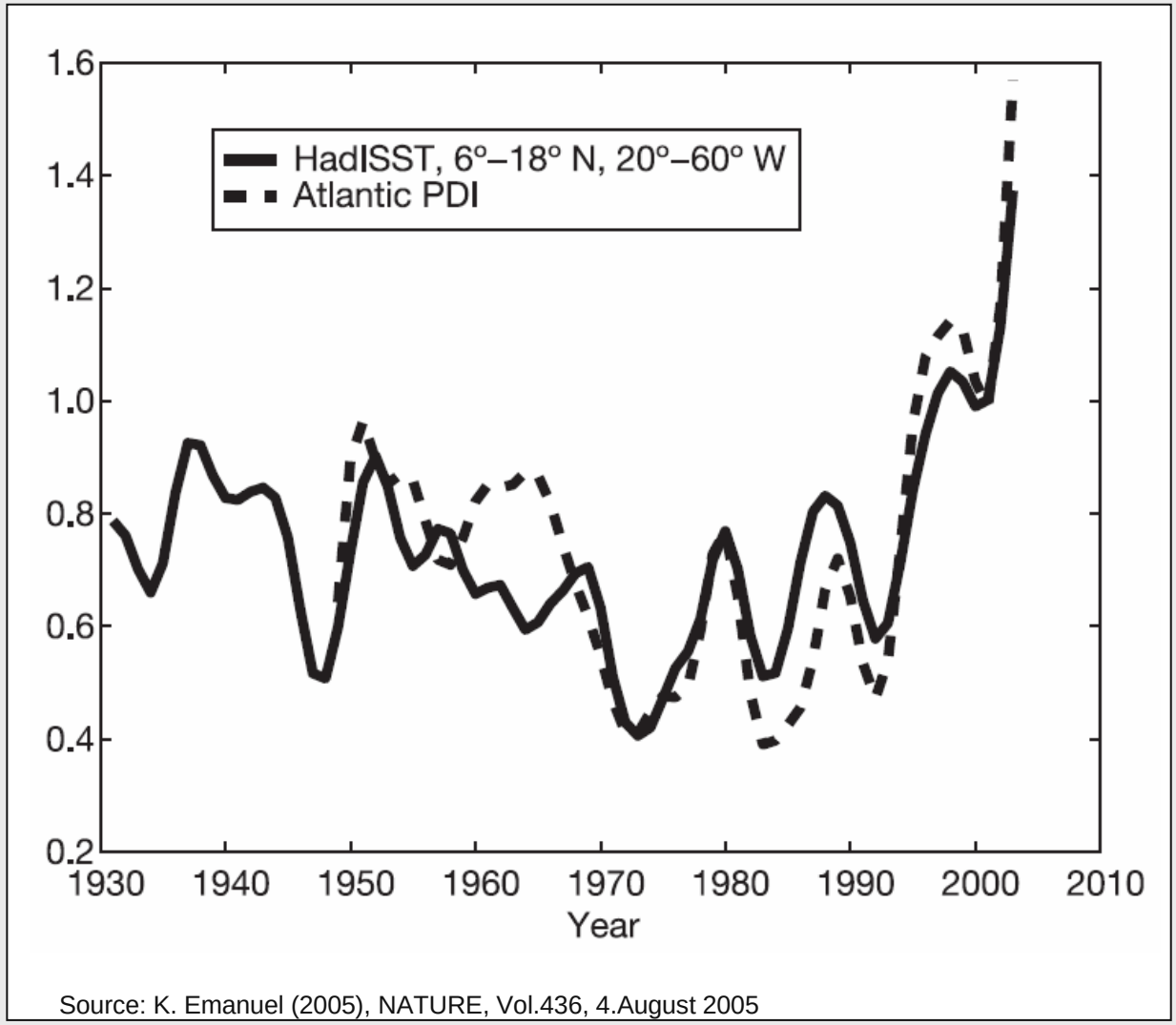

Source: K. Emanuel (2005), NATURE, Vol.436, 4.August 2005

Power Dissipation Index (PDI):

a measure of the total power dissipated anually by tropical cyclones

Changes in Sea Surface Temperatures

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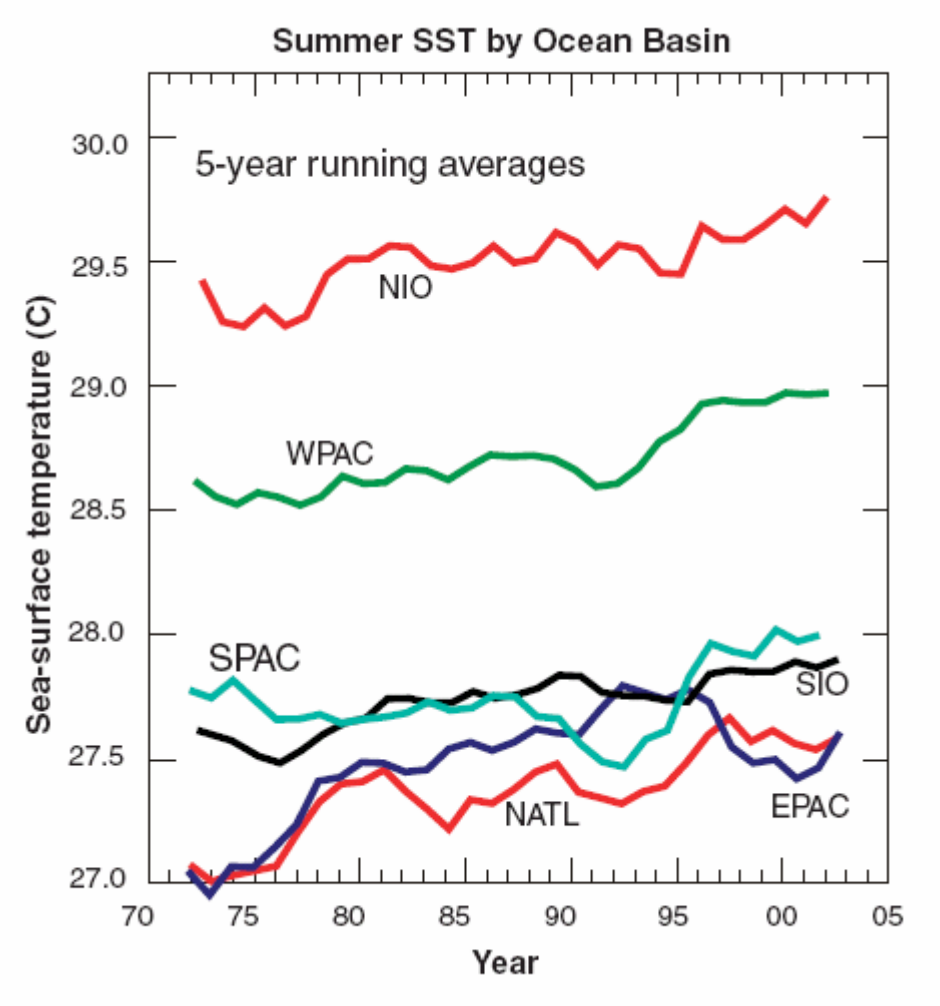

NATL = North Atlantic

WPAC = West Pazific
SPAC = South Pazific
EPAC = East Pazific
NIO = Northern Indic
SIO = Southern Indic
SH = Oceans of the Southern Hemisphere

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

Tropical Cyclones in the Atlantic

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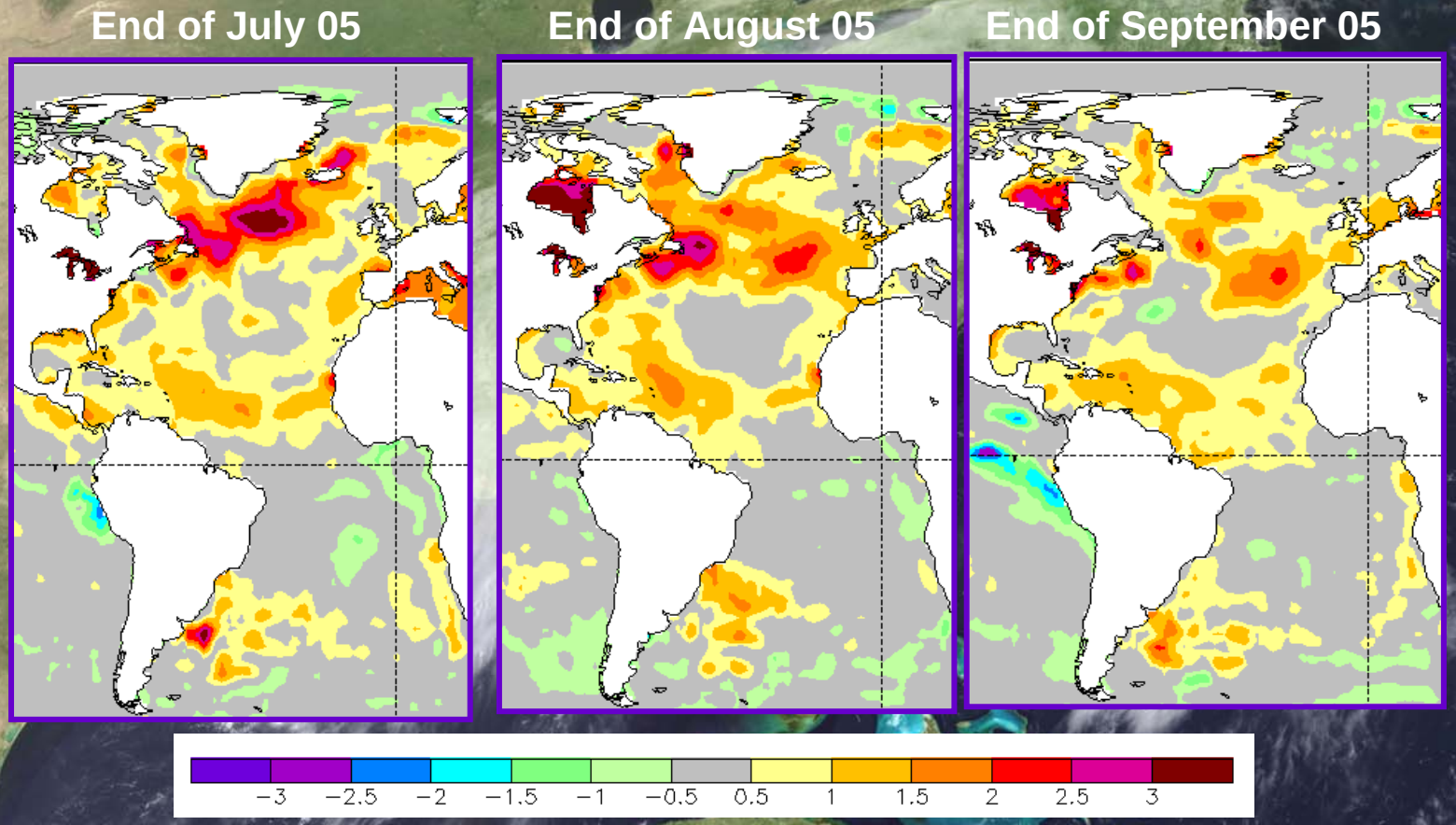
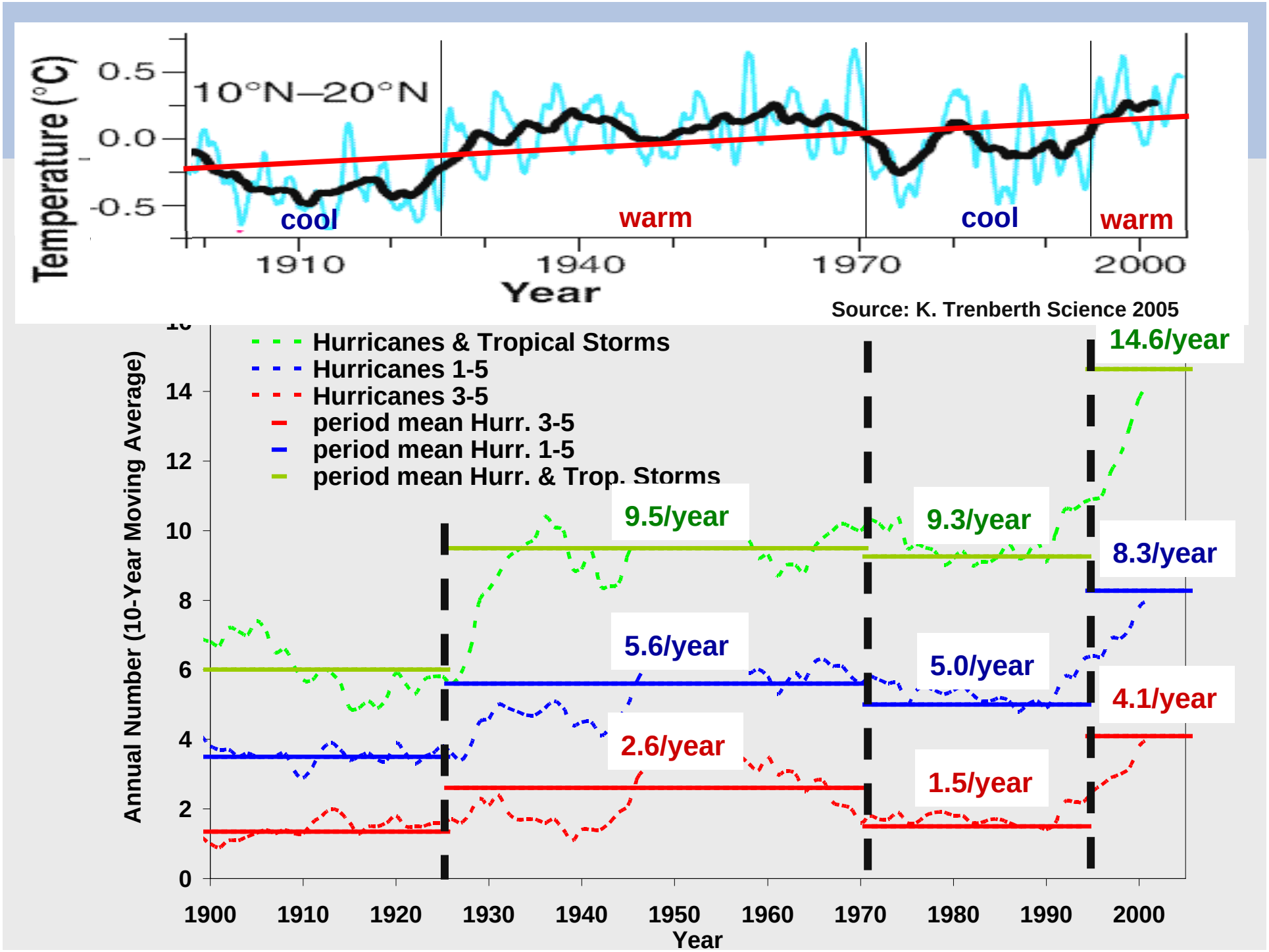


Tropical North Atlantic by up to 2°C warmer than on average


Temperature (°C)
0.5
0.0
-0.5
10°N–20°N
cool
warm
cool
warm
1910
1940
1970
2000
Year
Source: K. Trenberth Science 2005
Hurricanes & Tropical Storms
Hurricanes 1-5
Hurricanes 3-5
period mean Hurr. 3-5
period mean Hurr. 1-5
period mean Hurr. & Trop. Storms
Annual Number (10-Year Moving Average)
14
12
10
8
6
4
2
0
9.5/year
9.3/year
14.6/year
8.3/year
5.6/year
5.0/year
4.1/year
2.6/year
1.5/year
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

Global Warming and hurricane landfalls in the US

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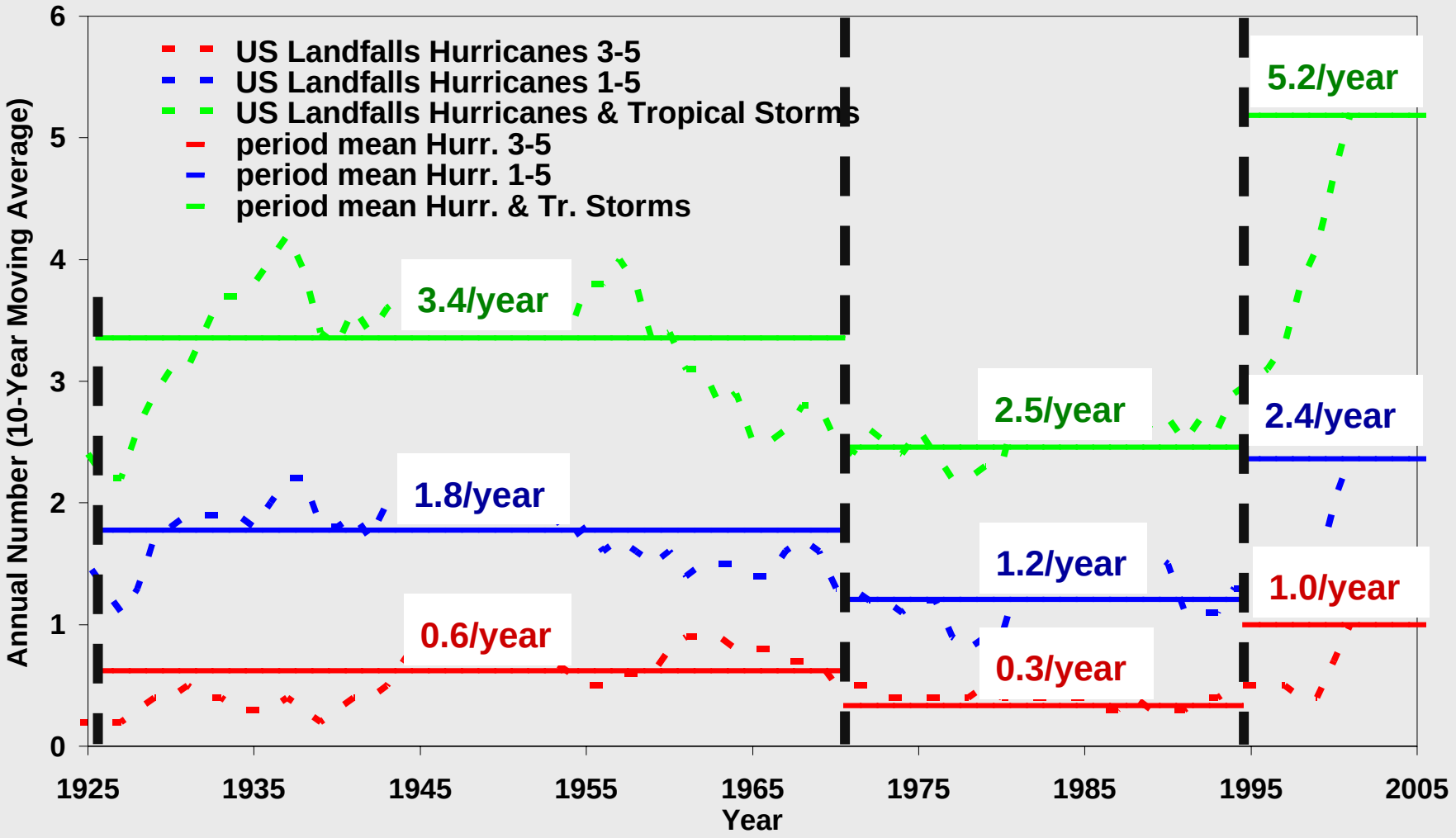

Activities of Munich Re for Climate Protection and Adaptation

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Collaboration with UNEP-FI: 2003-2005 chairing the Climate Change Working Group

Board member of European Climate Forum (ECF)

Member of Climate Group

Member of the Global Roundtable on Climate Change (GROCC, Initiative by Jeffrey Sachs)

Initiator of Munich Climate Insurance Initiative (MCII) in April 2005

MCII Members and Contact

MCII

Munich Climate Insurance Initiative

The MCII was founded in April 2005 in Munich by representatives of

- Germanwatch,
- IIASA,
- Munich Re, Munich Re Foundation
- the Potsdam Institute for Climate Impact Research (PIK),
- the Swiss Federal Institute of Technology (SLF),
- the Tyndall Centre,
- the World Bank,

and independent experts.

The group is open to new members, e.g. representatives of other insurance or reinsurance companies, climate change and adaptation experts, NGOs, and policy researchers seeking solutions to the risks posed by climate change.

For more information about the MCII please contact Koko Warner at warner@slf.ch.

MCII Mission Statement

MCII

Munich Climate Insurance Initiative

MCII strives to fulfill four objectives

1. **Develop insurance-related solutions to help manage the impacts of climate change,** seeking to combine the resources and expertise of the public and private sectors.
2. **Conduct and support pilot projects for the application of insurance-related solutions** in partnerships and through existing organisations and programmes. Identify success stories and disseminate information on the factors that are necessary to design and implement effective climate-insurance related mechanisms. These activities will focus on developing countries but at the same time will involve evaluating insurance solutions that have been used in developed countries.
3. **Promote insurance-related approaches in cooperation with other organisations and initiatives** within existing frameworks such as the United Nations system, international financial institutions, international donors, and the private sector.
4. **Identify and promote loss reduction measures** in connection with climate related events

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Munich Re Climate Strategy: Strategic implementation of relevant climate change issues in underwriting, products and markets, asset management internally

22 experts from science, industry and politics deal with the aspects of climate change: e.g. Hartmut Grassl, Stefan Rahmstorf, Hans-Joachim Schellnhuber.

Ordering information:
264 pages
ISBN 3-937624-80-5

•Online: www.pg-verlag.de/mr
•E-Mail: bestellung@pg-verlag.de
•at all bookstores

Strategic board game “Winds of Change”

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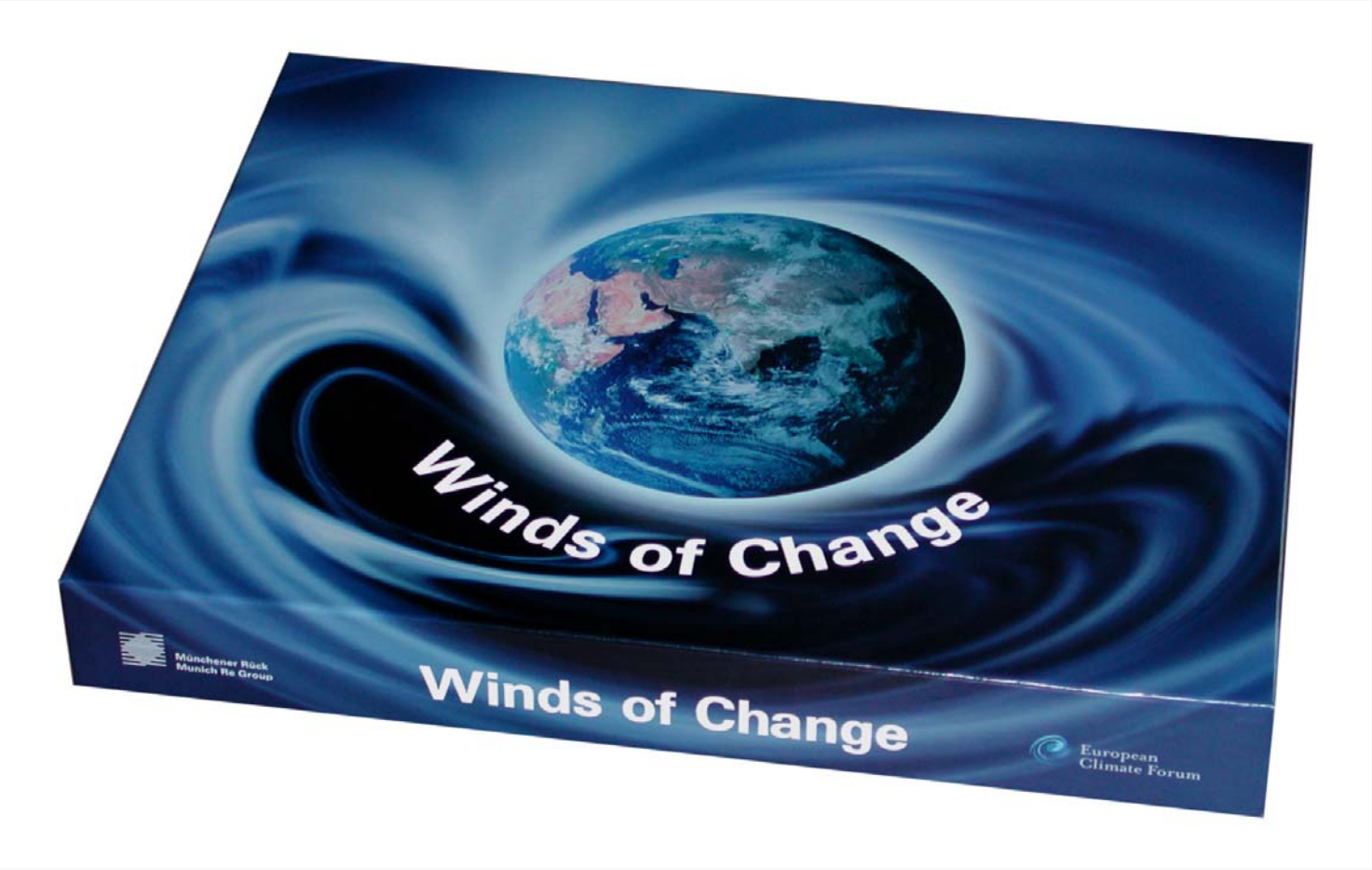

MR Geo Risks Research in the Internet

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Losses from geo risks are increasing dramatically worldwide. Munich Re has been researching geoscientific phenomena, their risks and their loss potentials, since 1974.

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Extreme weather events become more and more frequent, leading to an increase in the number and size of loss occurrences. »more

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Background
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>> Risk factors in reinsurance
>> Natural hazard event versus natural catastrophe
>> Review of 2004
>> Review of 2003

Publications
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Conclusions

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- Climate change has already started. It can only be slowed down, but not be stopped anymore.
- Natural catastrophes are increasing dramatically in number and magnitude. Loss potentials have reached new dimensions.
- In order to avoid „dangerous climate change“ we need to act now: both reductions of greenhouse gas emissions and adaptation are necessary.
- The insurance industry is very powerful for supporting climate protection (products, investments, information, sponsoring)

Thank you for your interest!