2017 Natural Catastrophes in perspective
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Cats in 2017: the number’s walk!
Insured losses in 2017: USD 144 billion, highest ever

![Insurance losses 1970-2017 in USD billion, at 2017 prices](image)

Source: Swiss Re Institute

2017 hurricane season: second costliest ever

![Insurance losses from North Atlantic hurricanes 1990-2017 (USD billion) at 2017 prices](image)

Source: Swiss Re Institute
Tubbs: the insurance industry’s costliest fire event ever on *sigma* record

2017 Cat season: unprecedented but not unexpected?
Wildfires: a burning issue for insurers?

1. Longer fire seasons
2. Increased frequency of large wildfires (>400 hectares)
3. Increased exposure

Record-breaking insured losses from wildfires in 2017

**Figure 5**
Insured losses from wildfires in the US and Canada since 1980 by decade (USD billion), at 2017 prices

Source: Swiss Re Institute
Hurricanes Harvey – Irma – Maria: 
Three North Atlantic Hurricane in quick succession
Each special in their own way!

Harvey
Rainfall up to 60in/1.5m in Houston. Largest ever from a hurricane.
Rapid intensification: Category 4 within 48 hours

Irma
At category 5 strength for more than 72 hours.

Maria
Infrastructure breakdown: power, communication, utilities
Rapid intensification: Cat1 to Cat5 within 15(!) hours

Direct category 5 hit on Barbuda, St. Martin, Anguilla, Virgin Islands.

A foreseeable cluster of events?

Major hurricane development depends on a fickle balance of various factors:

Ocean temperature
Humidity
Wind shear (seasonal)

Initial disturbance
Ventilation
Wind shear (weekly/monthly)

More research on clustering of intense hurricanes is crucial
Global warming / climate change

Were the HIM storms more severe because of global warming?

Climate model projections, year 2100

→ higher sea levels
→ less overall, but more high-intensity tropical cyclones
→ more extreme precipitation events

Climate variability

Is the long-term average hurricane activity commensurate with today’s risk?

Atlantic multi-decadal oscillation (AMO)

→ Atlantic hurricane activity correlated with sea surface temperatures
→ Driving mechanisms: atmosphere dynamics, ocean dynamics, aerosol amount
→ AMO index by NOAA\textsuperscript{1} remains strongly elevated

\textsuperscript{1} see National Oceanic & Atmospheric Administration, https://www.esrl.noaa.gov/p epubdata/timeseries/AMO/
How often does a HIM-like event cluster happen?

It depends on what we look at…

- Economic losses?
- Number of (severe) Atlantic hurricanes?
- Accumulated energy released during the season (ACE)?
- Sum of insured losses from any natural catastrophe?
- Fatalities, people injured, homes destroyed?
- Sum of insured losses from hurricanes in the Atlantic?

How often does a HIM-like event cluster happen?
Uninsured losses from catastrophes in 2017: USD 193 billion

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