The Irish Climate Science Forum (ICSF, www.ICSF.ie)
And **Climate Intelligence (CLINTEL, www.CLINTEL.org)**

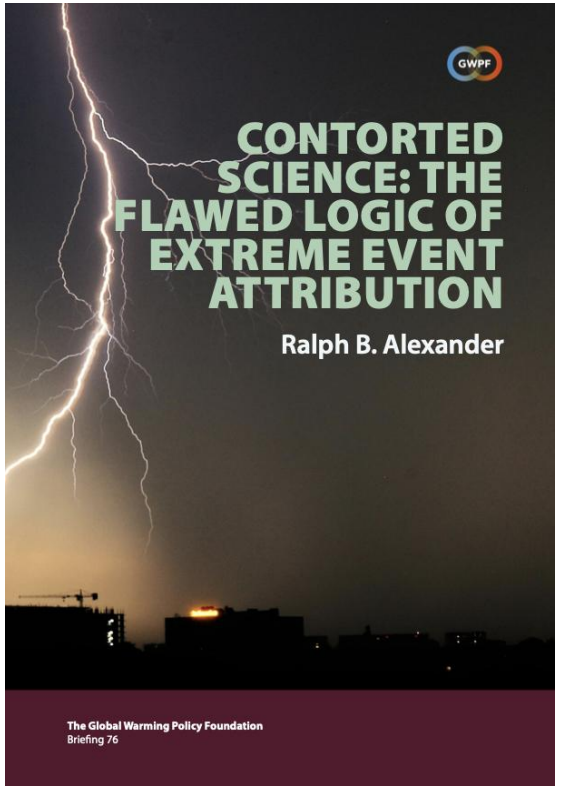
Presents

"Exposing the Pseudoscience behind Extreme Weather Attribution"

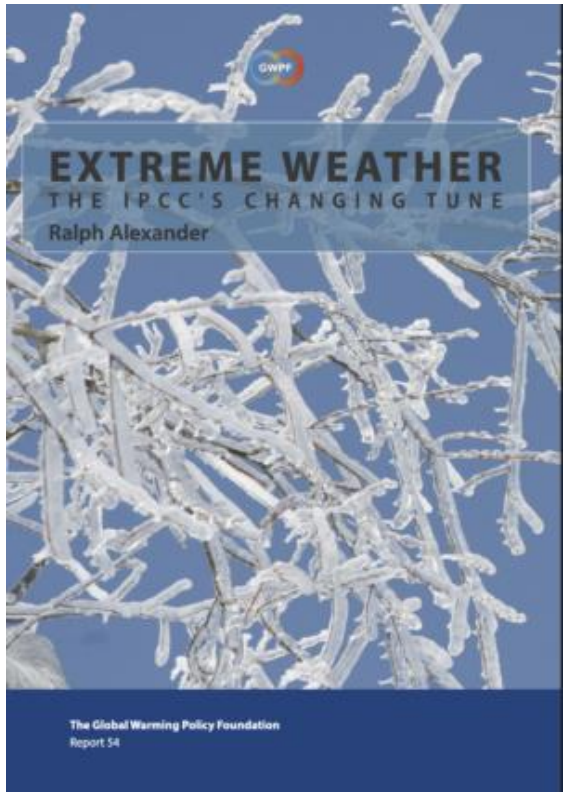
Dr Ralph B Alexander

Science Under Attack 

Based partly on GWPF reports:



[2026]



[2022]

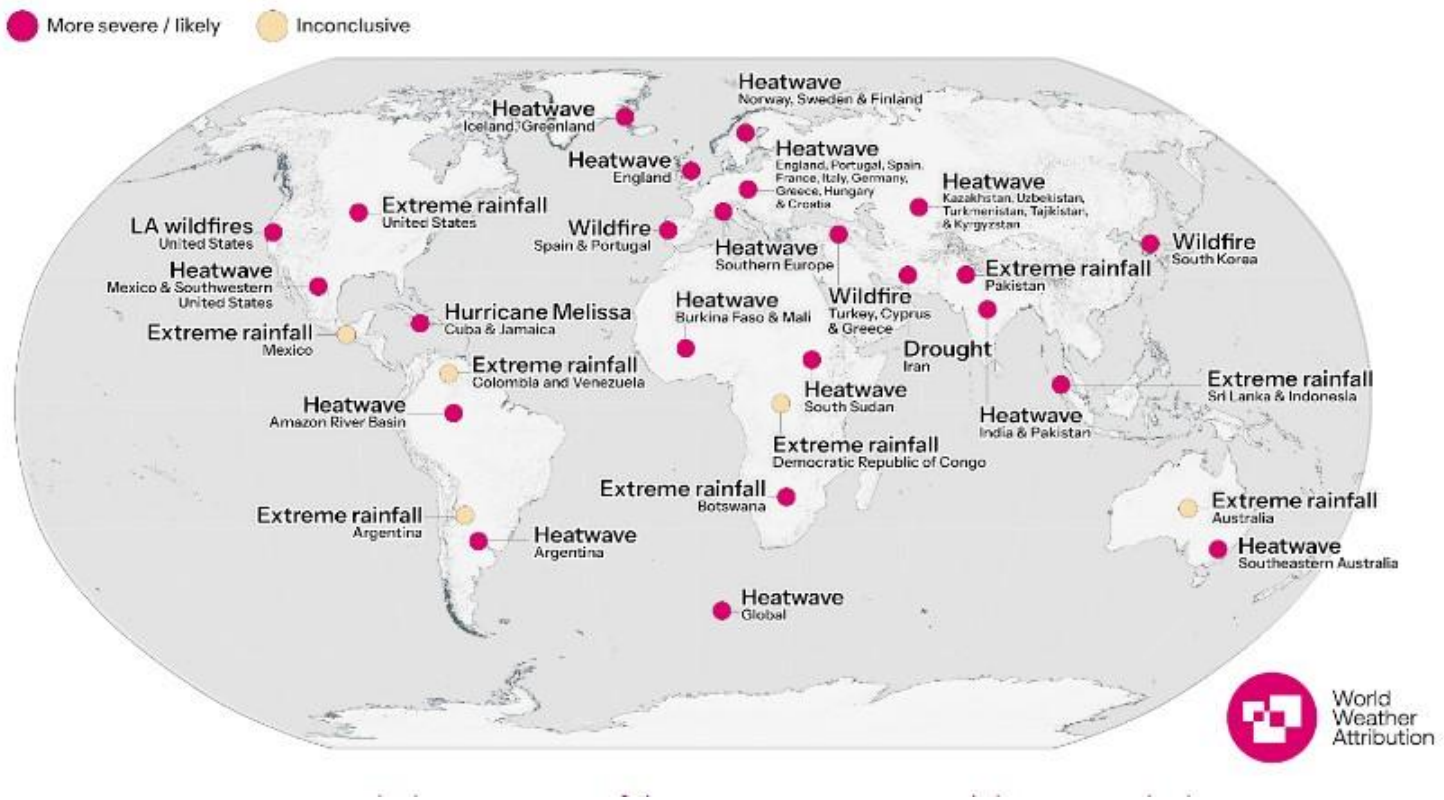
- Extreme event attribution studies are being used to bolster the perception that weather extremes are becoming more common and intense.

- The studies attempt to describe how much specific extreme weather events are influenced by anthropogenic climate change.

- Mainstream media and government reports have latched on to event attribution to fan the flames of climate alarmism.

Extreme event attribution studies, 2025

(World Weather Attribution)



24 of 29 events more severe/likely?

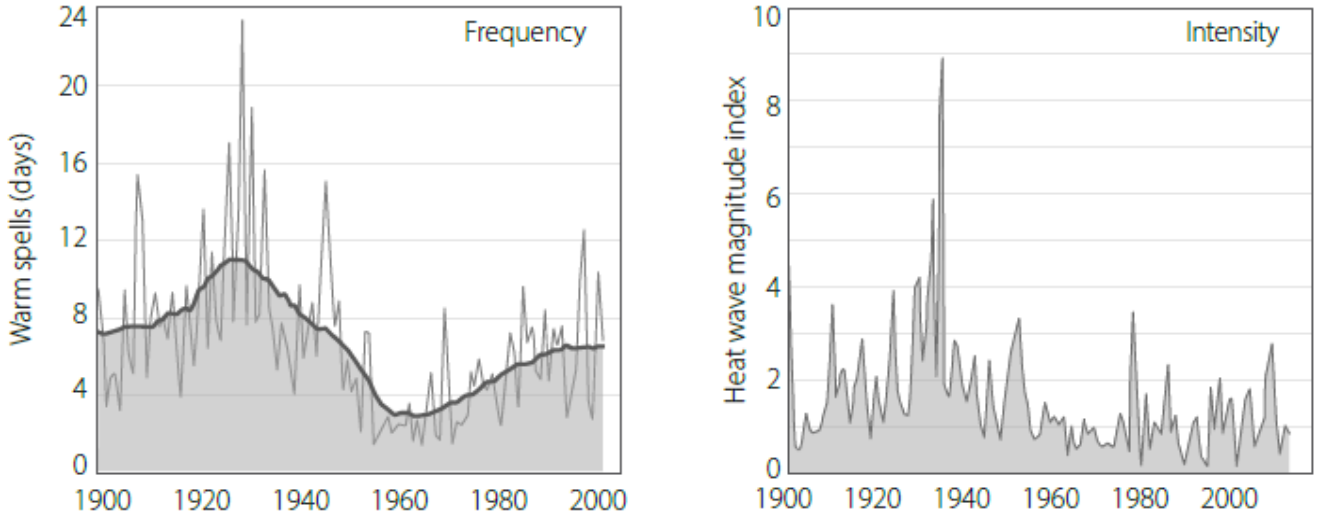
However:

1. **The perception that all types of weather extremes are increasing in frequency is false.**

2. **The methodology of event attribution studies is highly questionable – particularly their heavy dependence on climate models.**

3. **The studies were created for legal and political, not scientific reasons.**

Extreme weather historical patterns: Heatwaves

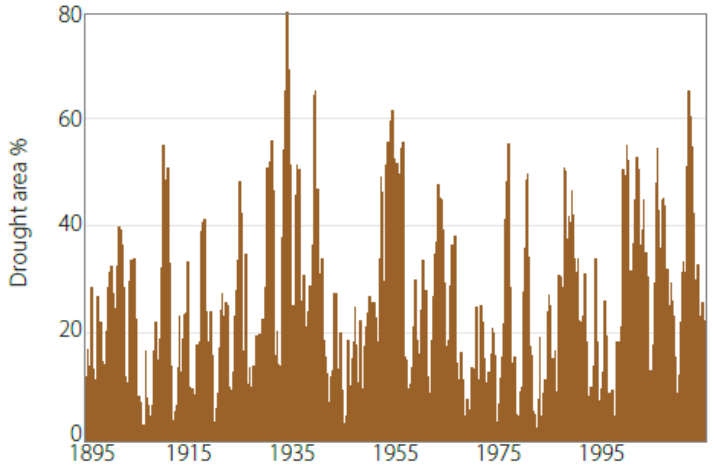


US heatwaves since 1900
- declining trend

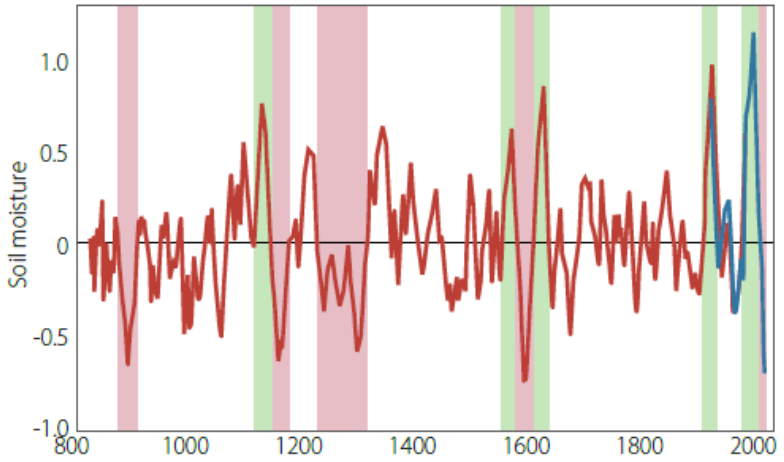
	Record (°C)	Year record set
North America	56.7	1913
Europe	48.0	1977
South America	48.9	1905
Asia	53.9	2016
Africa	55.0	1931
Australasia	50.7	1960
Antarctica	19.8	1982

Continental maximum temperature records
– nearly all set in past

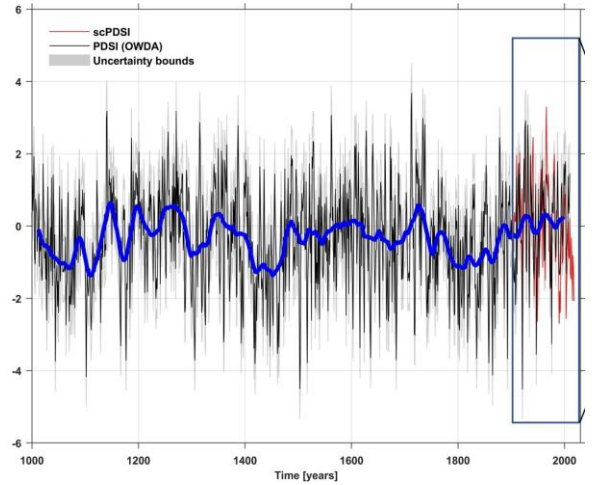
Extreme weather historical patterns: Droughts



US drought since 1895
– no trend

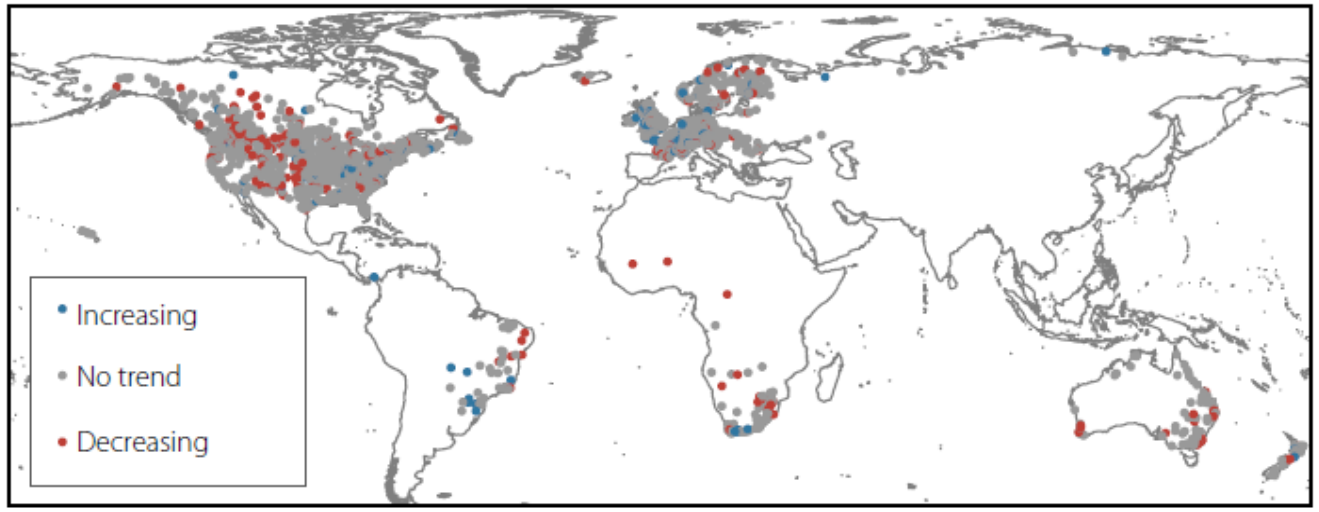


Drought in California since 800
– no trend



Drought in central Europe 1000-2018
– no trend

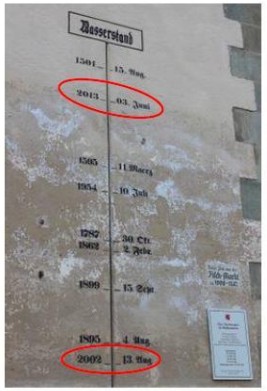
Extreme weather historical patterns: Floods



Worldwide flooding events 1966-2005 – net declining trend

Is There an Increase of Extreme Weather?

Flood Levels of the River Lech in Passau, Germany



The writing is on the wall since 500 years:

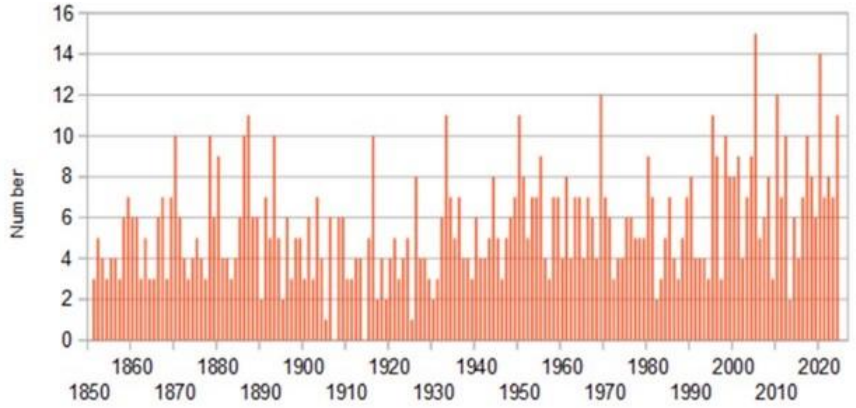
Only two of nine severe flood events during the past 70 years

Highest flood level ever recorded was in 1501, and the third highest in 1595

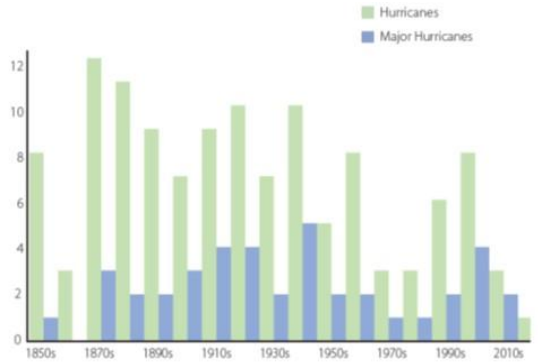
=> There is no increase of severe floods in recent decades. Extreme weather is always with us!

River Lech (Germany) flood levels since 1501 – no trend

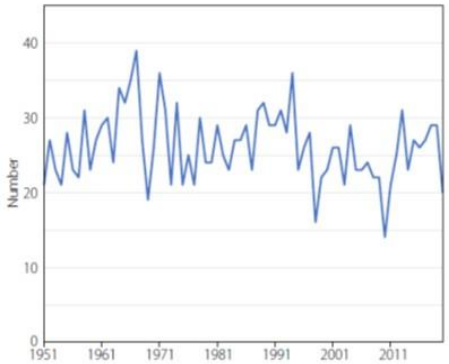
Extreme weather historical patterns: Hurricanes



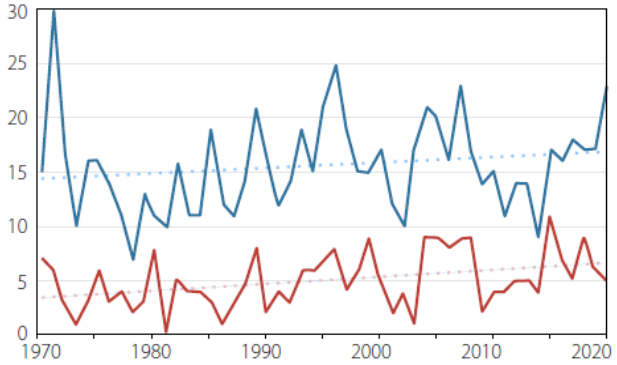
Atlantic hurricanes 1851-2024
– no trend (but see slide 34)



Florida landfalling hurricanes since 1850
– declining trend

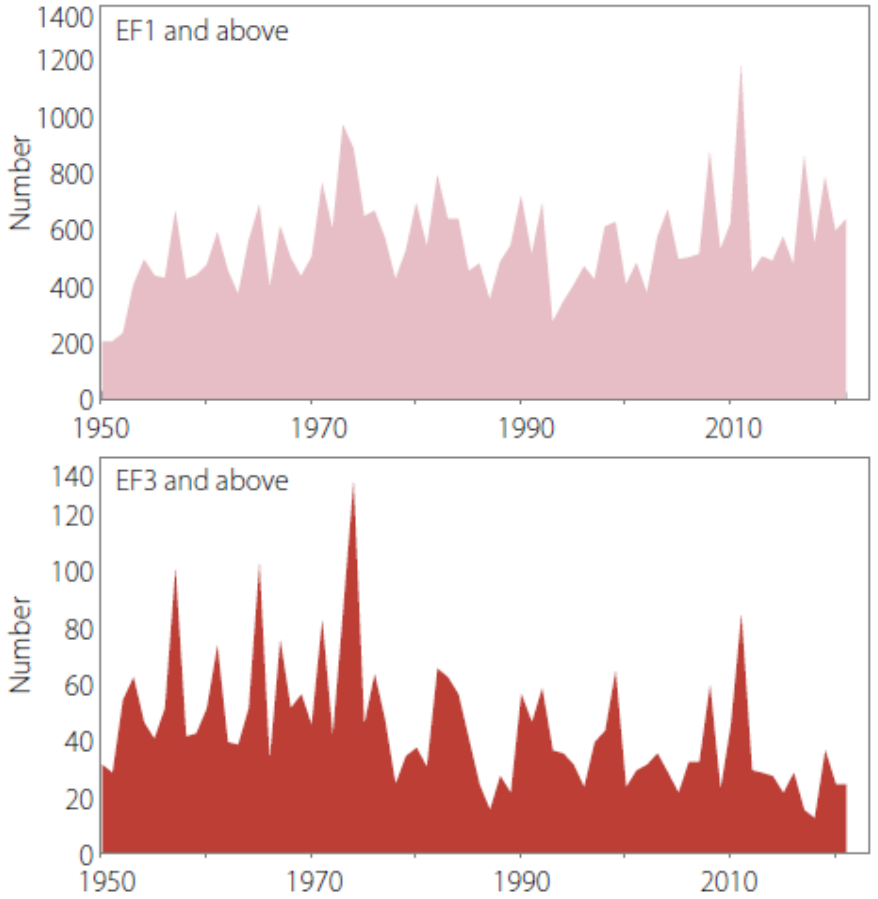


Typhoons since 1951
– no trend



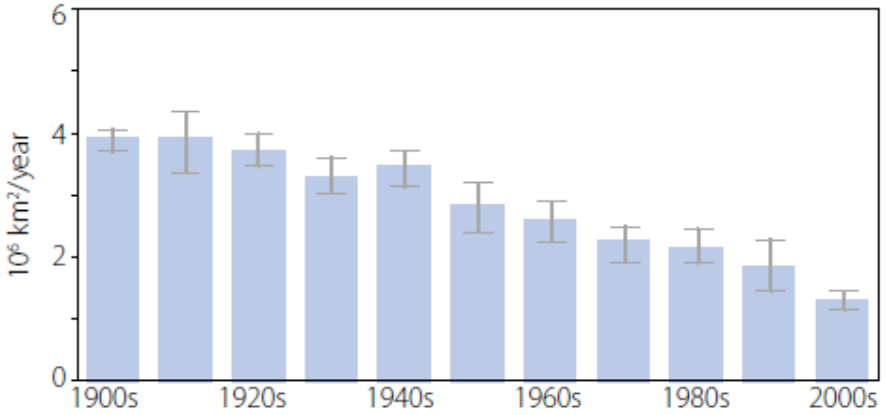
Global landfalling tropical cyclones 1970-2020
– no statistically significant trend

Extreme weather historical patterns: Tornadoes

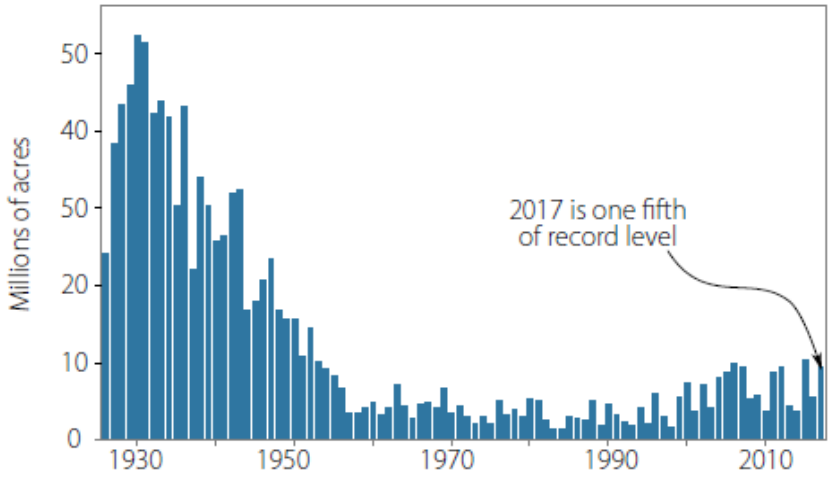


US tornadoes 1950-2021
– declining trend (strong tornadoes)

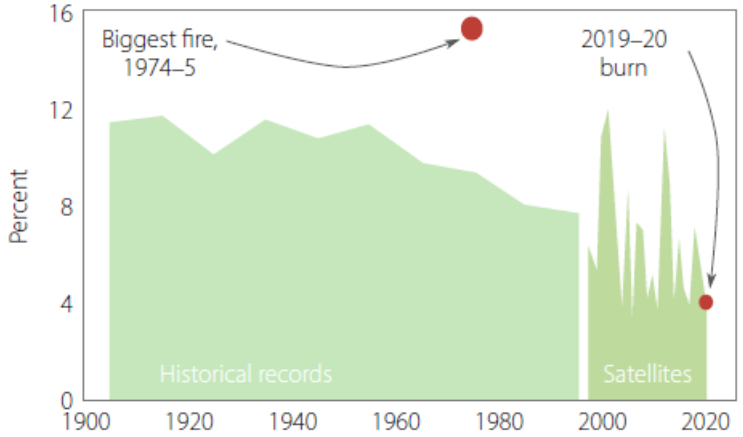
Extreme weather historical patterns: Wildfires



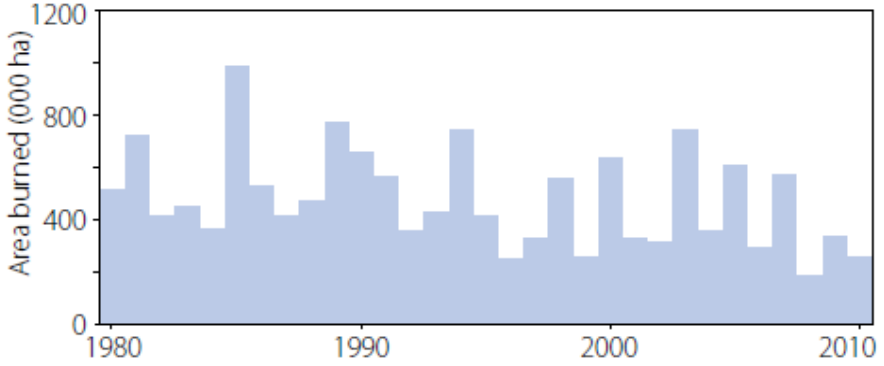
Global wildfire area burned since 1900 – declining trend



US forest area burned by wildfires 1926-2017 – declining trend



Australian area burned by wildfires 1905-2020 – declining trend



Mediterranean burned forest area 1980-2010 – declining trend

Extreme weather historical patterns: The IPCC's stance

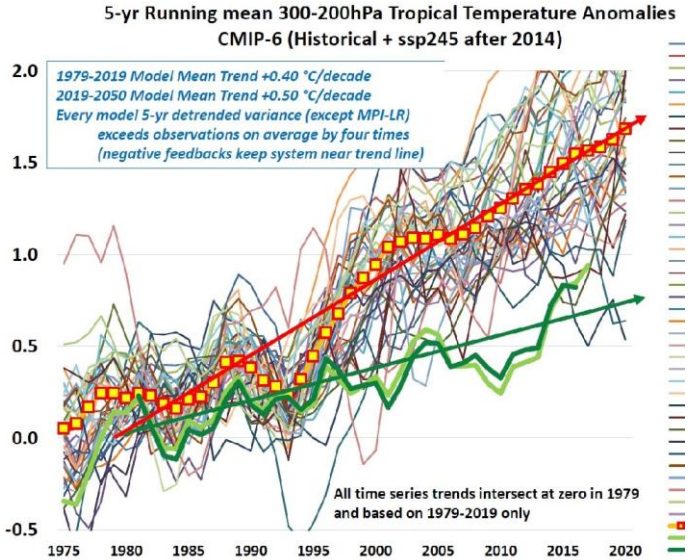
- The AR6 report of the IPCC (Intergovernmental Panel on Climate Change) in 2021 hedged its bets on extreme weather.

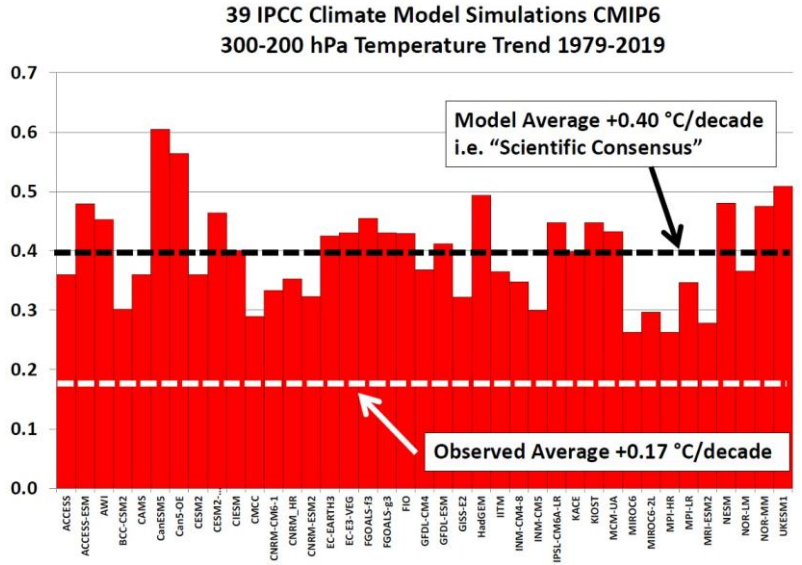
- The report claimed *limited evidence* for anthropogenic effects on floods, tornadoes and wildfires – despite the actual declining trends in all three.

- The IPCC also claimed *strengthened evidence* since its previous AR5 report for the attribution of heatwaves, droughts and tropical cyclones to human influence – again, contrary to the actual scientific evidence of no or declining trends.

Attribution studies rely on computer climate models

1. A majority of models significantly overestimate the global warming rate.



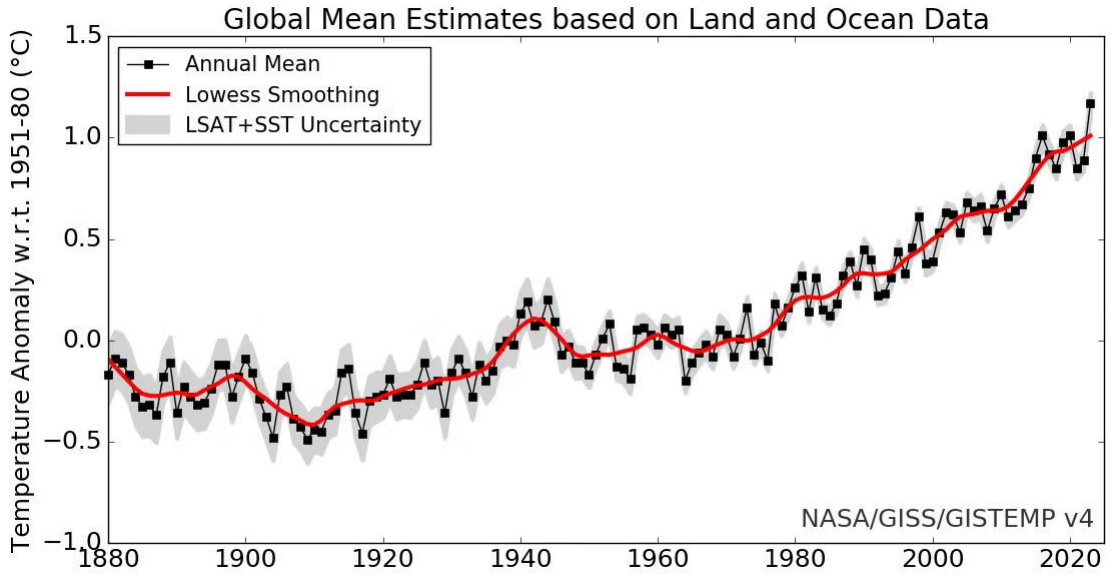


2. The models incorrectly predict a hot spot in the upper atmosphere that isn't there.
3. They are unable to accurately reproduce sea surface temperatures and sea-level rise.
4. Individual climate models are not wholly independent, so the number of models is typically overstated in attribution studies.

Most importantly for attribution studies, the models are poor at hindcasting.

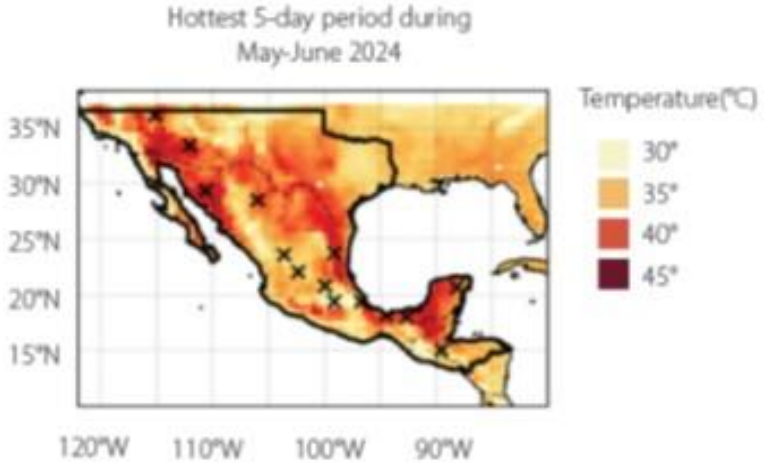
That matters because the models are used to compare the present climate with anthropogenic CO_2 emissions to a preindustrial climate without the extra CO_2.

The models underestimate the warming during the global warming spell from 1910 to 1940. So how can they credibly simulate the preindustrial climate before 1850?



Case study 1: Heatwave in the US southwest, Mexico and Central America, May-June 2024

- Alarmist media: "**35 times more likely**" than in preindustrial past.
- Attribution study by Grantham Institute at Imperial College, London.
- Used 49 regional and global climate models, together with three temperature datasets, to calculate the purported change in heatwave likelihood.



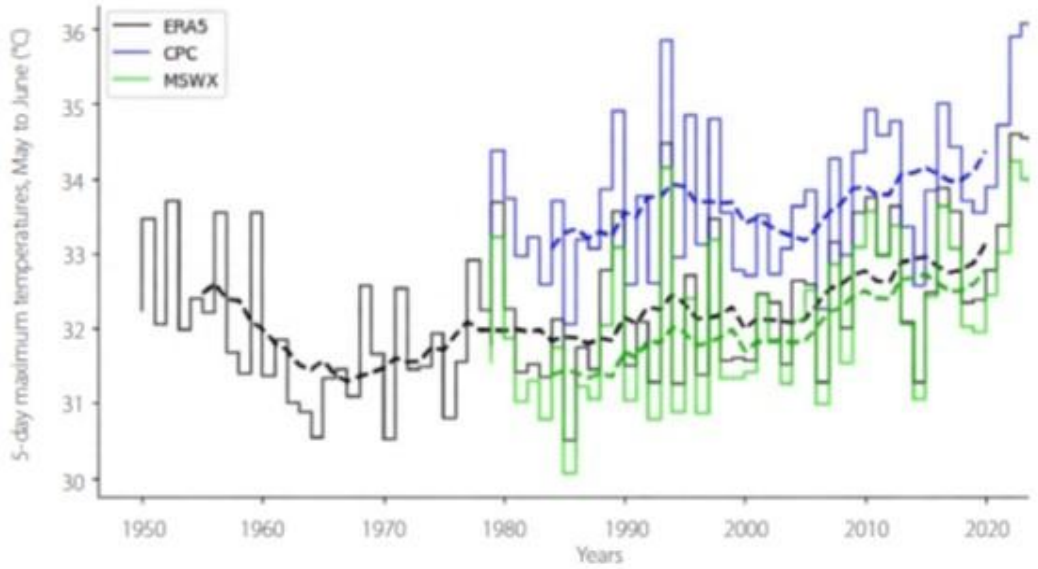
Major flaws in US heatwave attribution study

1. Lack of reliable historic meteorological data for most countries, except US and UK. No historical data worldwide for cloud cover and wind speeds.

   So cannot accurately predict preindustrial “natural” climate.

Major flaws in US heatwave attribution study

2. Temperature dataset limitations.

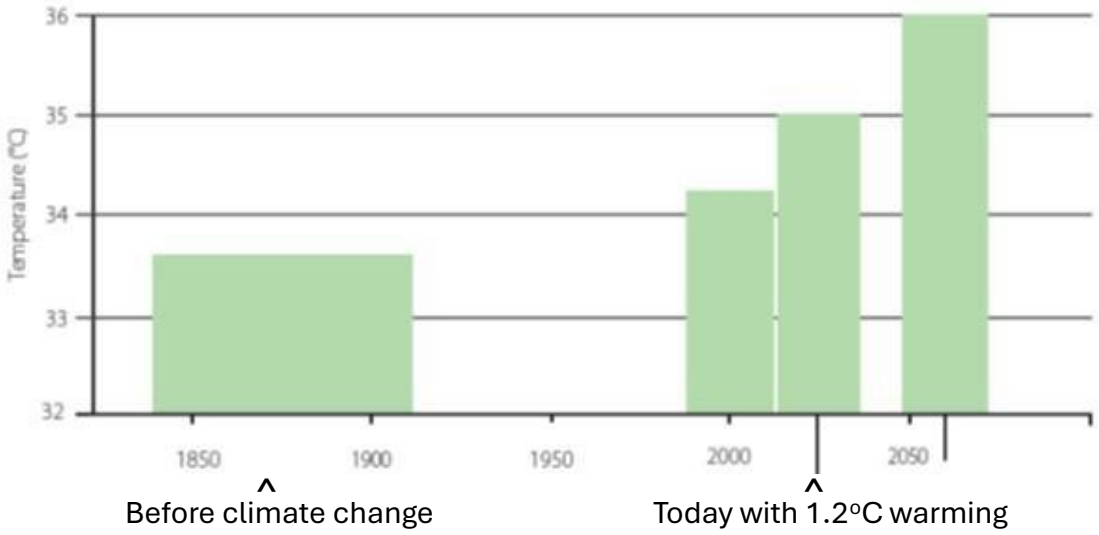


- "35 times more likely" is an average estimate for all three temperature datasets.
- But estimate for only ERA5 data which goes back to 1950 is just 13 times more likely (95% confidence).
- Hindcasting the preindustrial climate, already a problem in climate models, is even less reliable because no temperature data for study area before 1950.

Major flaws in US heatwave attribution study

3. Study takes no account of uncertainty in temperature measurements.

   - Possible heatwave in early 1990s, comparable to 2024.
   - Temperature uncertainty allows the probability compared to the past of the 2024 heat wave to be as low as 2.6 to 3.2 times more likely (95% confidence), depending on the temperature dataset, rather than 35 times.
   - Heat wave magnitude may have been as low as 0.7°C (1.3°F) above normal, rather than the study's estimate of 1.4°C (2.5°F).



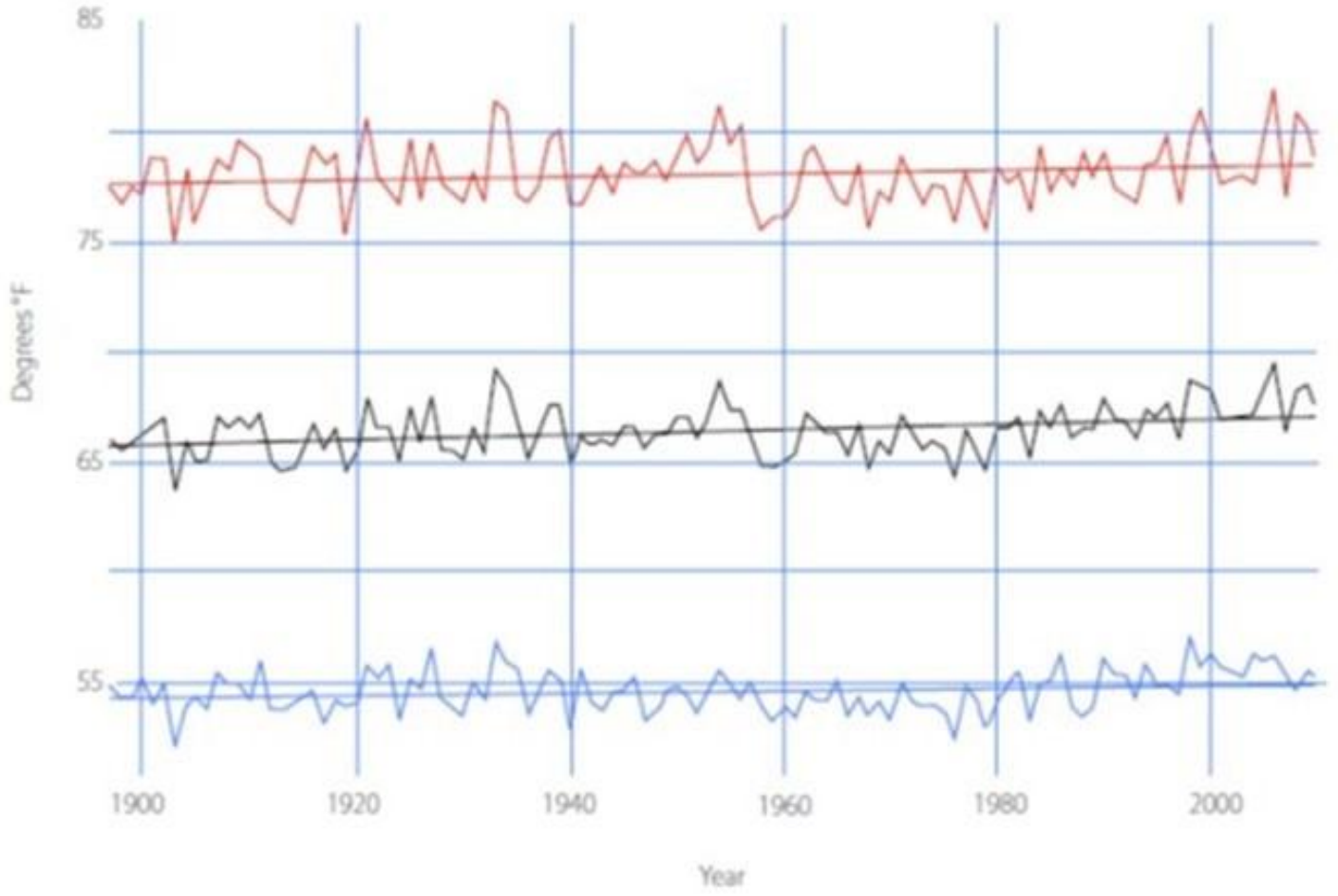
Case study 2: Devastating flash flood in central Texas July 4, 2025

- Guadalupe River rose to its second-greatest height on record, following torrential rain.
- Swept through holiday camps and homes, killing 137.
- Attribution study by French ClimaMeter.
- Concluded that “Natural variability alone cannot explain the changes in precipitation.”

Flaws in US flooding attribution study

- Catastrophic flooding attributed to two factors:
  - A purported temperature increase up to 1.5 °C (2.7°F) in the flood-affected area, from 1950–86 to1987–2023.
  - Rainfall up to 2 mm (0.08 inches) per day, or 7% wetter than in the past.
  - 95% confidence for both factors.
- But reference period of 1950–86 includes 25 of approximately 35 years of global cooling from 1940 to 1975.
- So the estimated temperature increase for central Texas between 1950 and 1986 is most likely inflated.
- A 2012 University of Arkansas graduate thesis concluded that actual warming in central Texas had only occurred since the mid-1990s.

Flaws in US flooding attribution study



Maximum temperature

Mean temperature

Minimum temperature

Flaws in US flooding attribution study

- Heavier rainfall does not necessarily cause an increase in extreme flooding probability.
- Probability depends on other factors such as rainfall duration, landscape and the type of river basin.
- Disastrous floods in Texas' Flash Flood Alley are nothing new.

Year	Death toll	Rainfall (inches)	Damage
2025	137	Up to 20	38,600 structures
2002	12	25–35	48,000 structures
1998	31	22	11,699 structures
1987	10	12	Church bus & van
1978	33	30	$110 million
1972	18	16	$20 million
1936	26	21	1,000 structures
1921	215	15–40	3,500 structures

Irish attribution studies 1: Summer heatwave July 11-12, 2025

Hot July weekend made warmer and more likely due to climate change (Internet report)

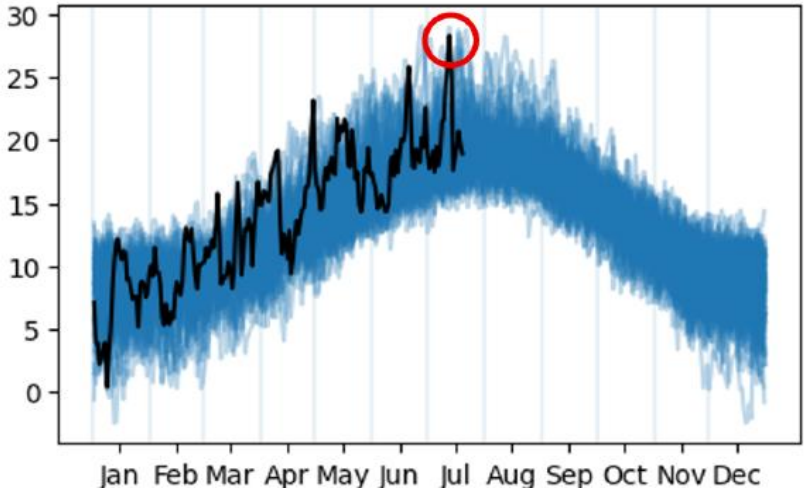
- Attribution study by ICARUS Climate Research Centre, Maynooth University.
- Heatwave supposedly 2.3-2.6 times more likely (95% confidence) than in preindustrial past.
- Used 44 regional and global climate models, together with four temperature datasets, to calculate the purported change in heatwave likelihood.

Flaws in Irish heatwave attribution study

1. Same dependence on defective climate models as US 2024 heatwave study, with false assumptions:
   - "(We are) fairly confident that the temperature data is modeled pretty accurately."
   - "The rapid increase in global temperatures is at a higher rate than any previous global temperature changes."
     - Untrue, as more rapid changes occurred 12,000 years ago and earlier.
2. Hindcasting the preindustrial climate, already a problem in climate models, is even less reliable because the earliest temperature datasets for the study area only go back to 1950.

Flaws in Irish heatwave attribution study

3. Heatwave not that remarkable, maximum temperatures within “noise” of past measurements:



Two-day average of maximum daily temperatures from 1961,averaged over whole of Ireland; black line is 2025 temperatures.

- Highest July 2025 temperature of 31.1°C (Roscommon Co.) was less than Ireland's all-time national record of 33.3°C in June 1887, or 2nd highest record temperature of 33.0°C in 2022.
- Study’s estimate of heat wave magnitude is1.4°C (2.5°F) – only slightly above global warming of 1.3°C (2.3°F).

Flaws in Irish heatwave attribution study

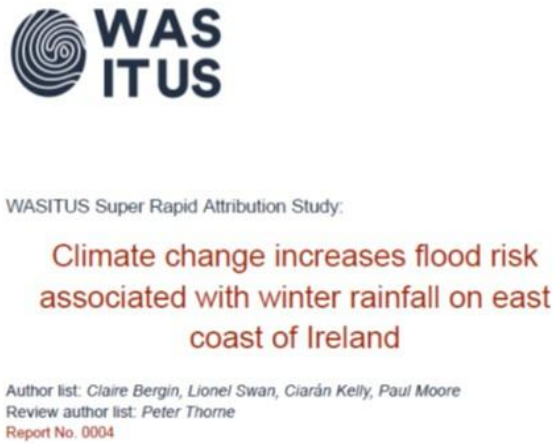
4. 2.3-2.6 times more likely conclusion doesn't reflect uncertainty in temperature measurements (although the uncertainty is included in the 95% confidence estimates in the actual study) – just as in 2024 US heatwave study.

Irish attribution studies 2: Winter flooding 2025-26

[Changing Weather Extremes: Are Humans to Blame?](#) (YouTube video)

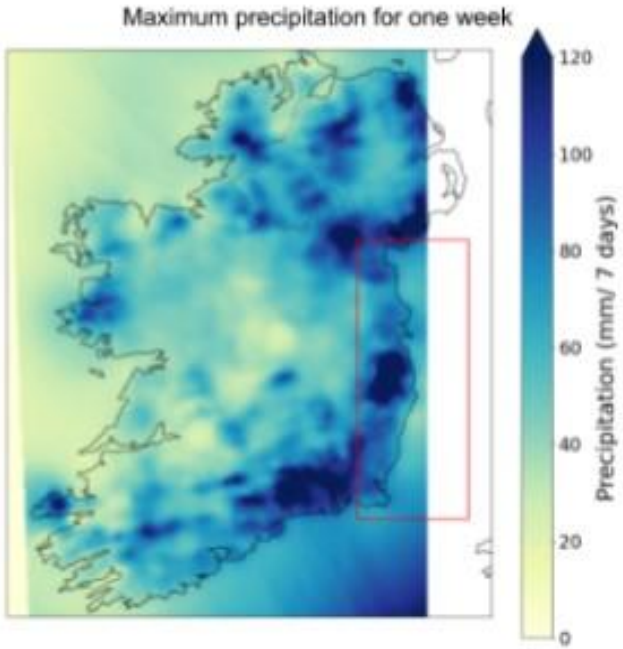
[Flood risk increased by climate change – study](#) (Radio interview)

- Record flooding in southeastern Irish counties during 2025-26 winter.
- Dublin also affected, near-record rain with disruptions to transport and water supply.
- Storm Claudia November 14-15, 2025.
- Storm Chandra January 26-27, 2026.
- Attribution study by ICARUS Climate Research Centre, Maynooth University.



Flaws in Irish flooding attribution study

- **Observations:**
  - Storm Claudia: 12% increase in 2-day rainfall (2X more likely?).
  - Storm Chandra: 9% increase in 7-day rainfall (3X more likely?).
- But these increases are nothing extraordinary, and **within the uncertainty range** of typical rainfalls.
- Typical uncertainties have been measured for annual maximums of 2-day and 3-day rainfall in Campinas, Brazil:
  - 2-day rainfall +/- 6-12% (95% confidence, return periods up to 100 years).
  - 3-day rainfall +/- 8-14% (95% confidence, return periods up to 50 years).



Flaws in Irish flooding attribution study

- Lack of attention to uncertainty in rainfall and temperature measurements in drawing 2X, 3X more likely conclusions (although the uncertainty is included in the 95% confidence estimates in the actual study).

History of attribution studies

- The studies were created for legal and political, not scientific reasons.
- The IPCC has been unable to assign even medium confidence to the detection and attribution of most types of extreme weather events.
- A problem for climate activists wanting to pursue litigation against fossil fuel companies.
- Activists therefore pushed for rapid extreme event attribution.

History of attribution studies

- Origins of climate lawfare date back to a 2012 meeting of US environmental advocates, climate scientists and others.
- Meeting attempted to mimic strategies from the 1960s campaign against smoking tobacco.
- But supposed connection between most forms of extreme weather events and global warming nowhere near as strong as connection between smoking and lung cancer.
- Nevertheless, meeting gave media license to promote notion that all extreme weather is evidence of climate catastrophe.

History of attribution studies

- World Weather Attribution founded to create a defensible scientific basis in support of lawsuits against fossil fuel companies.
- Growing industry: by September 2024, 50 lawsuits filed by US states, counties and local governments, and about half as many in Europe and other countries.
- So far, no oil and gas company has had to pay liability for damages associated with climate change.
- But many lawsuits are awaiting trial.

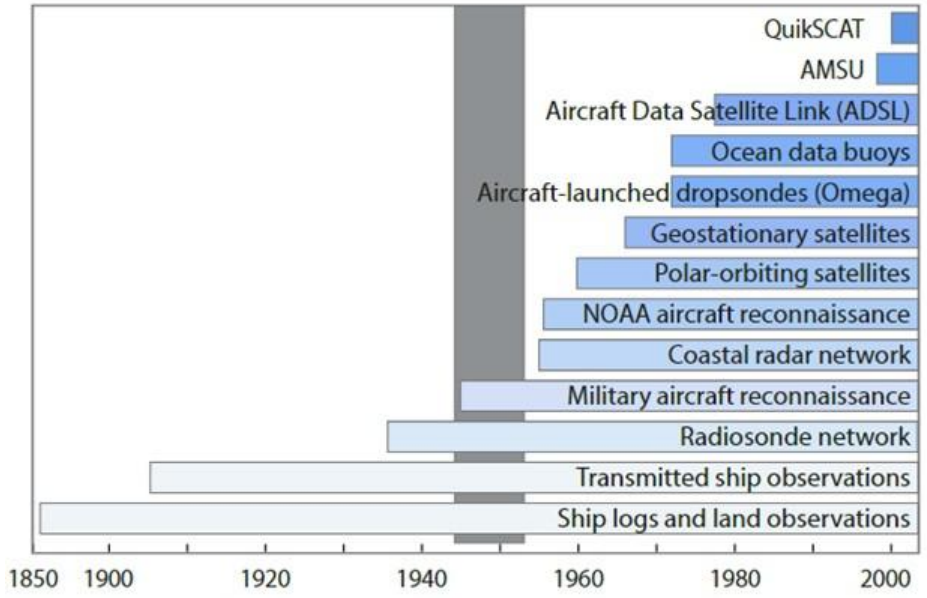
Why the perception that extreme weather is on the rise?

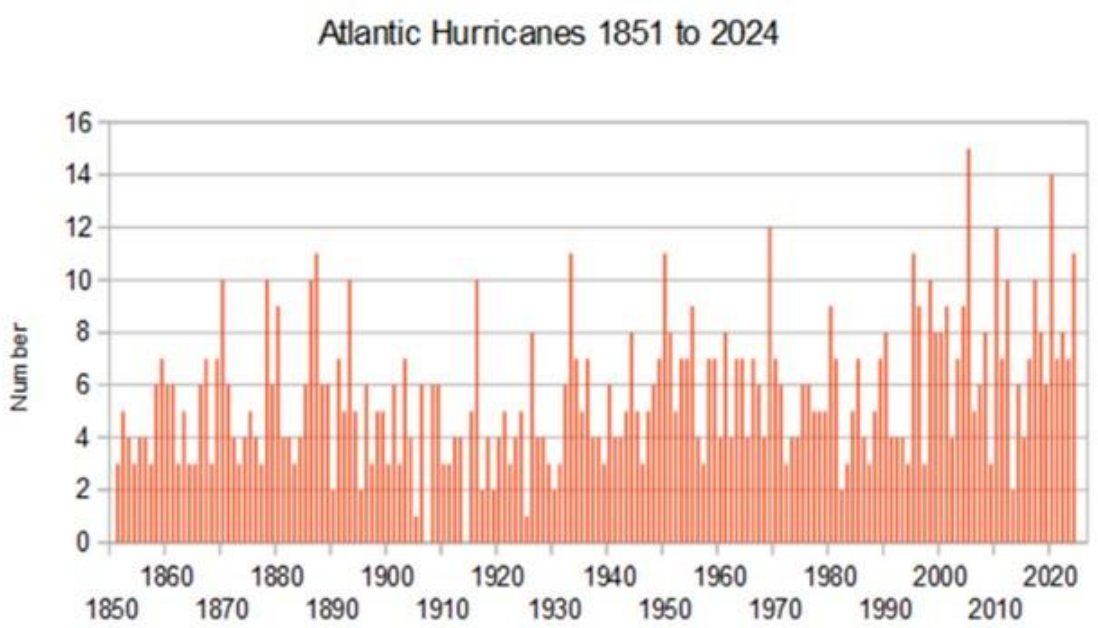
- Primarily a result of modern technology – the Internet and smart phones.
- Revolution in communication, making us much more aware of weather extremes than we were 50 or 100 years ago.

Why the perception that extreme weather is on the rise?

- Previously, many weather extremes unrecorded because of sparser population (e.g. tornadoes, wildfires, floods).

- Eyewitness accounts on land excluded most non-landfalling hurricanes, reports from ships at sea sporadic.





Fanning the flames of alarmism

- **CCN (Covering Climate Now)** is a coalition of more than 500 media outlets dedicated to producing *"more informed and urgent climate stories."*

- CCN includes three of the largest news agencies — Reuters, Bloomberg and Agence France Presse.

- The **Rockefeller Foundation** is funding climate reporters to "fight the climate crisis."
  - *Tips and examples to help journalists make the connection between extreme weather and climate change*.

Thank you!

- *Science Under Attack* blog
  https://www.scienceunderattack.com/