2018 Extreme winter wind storms in western Europe
Did climate change have a role to play?

Eupheme

The events

Storm Friederike - 18 January 2018

- At least eleven casualties and major disruptions (Netherlands and Germany)

- Estimated cost: €1,6 billion

- The second most expensive storm to strike Germany in the past 20 years

Storm Eleanor - 3 January 2018

- Thousands of homes affected by power cuts (UK and Ireland)

- Estimated cost: €700M (France)

- Sixth most severe storm since 1995 (France)

Western European countries have been struck by high-impact wind storms during the month of January 2018. The link between storms like Eleanor (on 3 January 2018) and Friederike (on 18 January 2018) and human-induced climate change have been studied through this attribution analysis involving several simulation ensembles and observations from tens of weather stations.
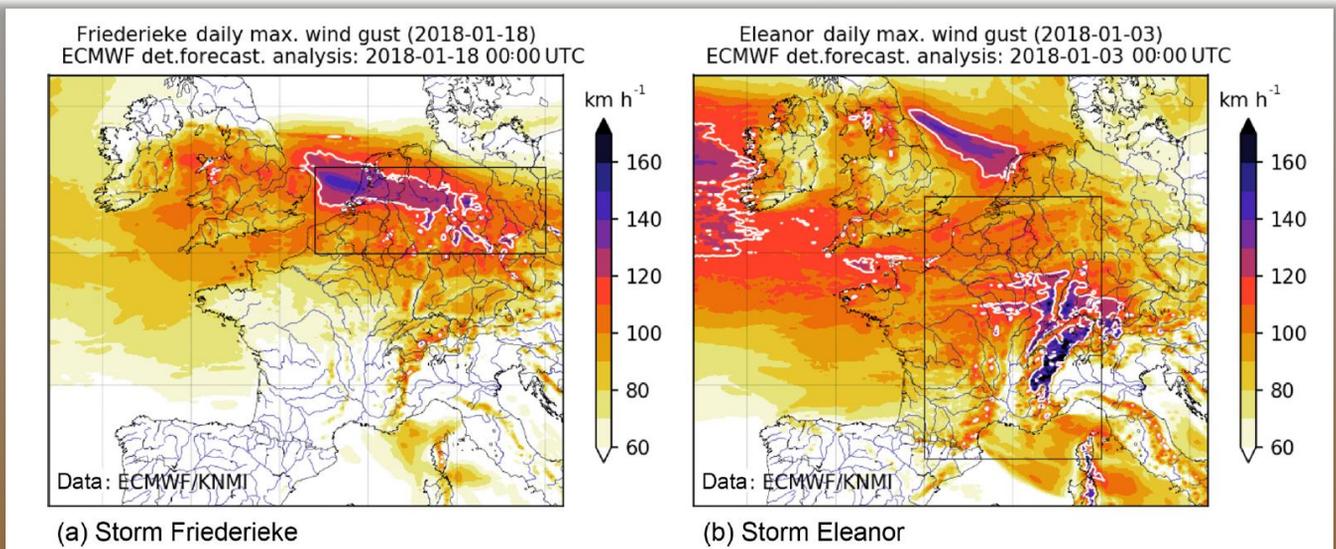

Figure 1. Strongest wind gusts during the storms Friederike (a) and Eleanor (b) as estimated from the ECMWF deterministic forecasts starting at 18 January 2018 00:00 UTC and 3 January 2018 00:00 UTC respectively. White contours are used to indicate areas where gusts exceed 118 km.h^{-1}. The boxes indicate the spatial event definitions.

The scientific publication: **www.earth-syst-dynam.net/10/271/2019/**
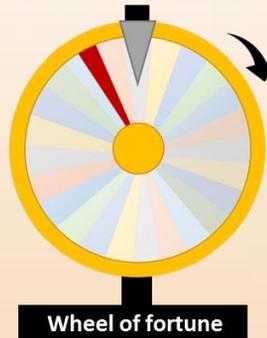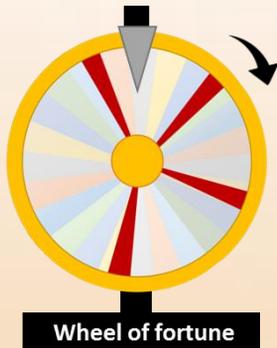The EUPHEME project website: **eupheme.eu**

Probability of occurrence of wind storms similar to Friederike
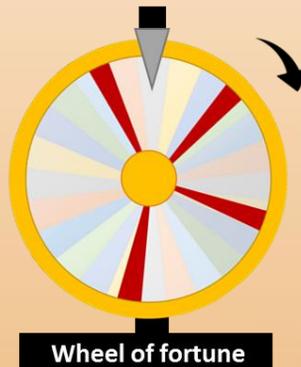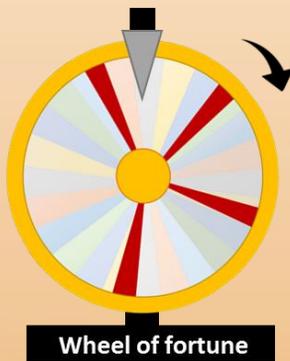## (the study finds similar results for the wind storm Eleanor)

	Past	Present	Future
Observations	Wheel of fortune	Wheel of fortune	
Models	Wheel of fortune	Wheel of fortune	Wheel of fortune

What is observed?

- **Observations exhibit a decreasing trend in the frequency of strong winds**
- **(4 times less probable)**

The expected effect of climate change

- **Climate models show no trend up to now**
- **Global warming could lead to a marginal increase (0% to 20%) in the probability**

Conclusions

- **In contrast to the observations, global and regional climate models do not simulate a decrease over the past decades.**
- **This negative trend may be due to other factors such as surface roughness, aerosols and decadal variability.**
- **Until these factors are correctly simulated by climate models, future storminess credible projection over land in Europe can't be provided.**