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## Background

- **Extreme Event Attribution (EEA)** is important tool to understand the role **anthropogenic activities** have on extreme weather events. EEA can be used to increase our **understanding** of these events in a changing world. Thereby, EEA can inform several different stakeholders in society, e.g. on disaster risk reduction pathways or litigation<sup>1</sup>.
- There are several different EEA methods, ranging from **unconditioned probabilistic** to **conditioned storyline** approaches. Probabilistic approaches study the changes of an **event class** (e.g. all heatwaves that are 30 °C), whereas storyline approaches study **one specific event** (e.g. the 2003 European heatwave)<sup>2</sup>.

## Motivation

- The **C3S operational attribution service from ECMWF** will consist of rapid attributions using the probabilistic and the circulation analogue attribution methods. The attribution team will also conduct additional in-depth analysis on specific events, which can e.g. include storylines<sup>4</sup>.
- Each attribution method provides a **unique perspective** on how anthropogenic changes has influenced an extreme event. Additionally, some methods can be better suited for specific event types than others. Therefore, one would ideally **combine different methods** when conducting an attribution study<sup>2</sup>.
- Here, we are conducting a **multi-method comparison**, ranging from unconditioned to highly conditioned attribution approaches, on an extensive set of **different events**. This allows us to provide **recommendations** to the scientific community and stakeholders, on the use of the C3S attribution service, and which lessons can be learned from different types of attribution.

## References

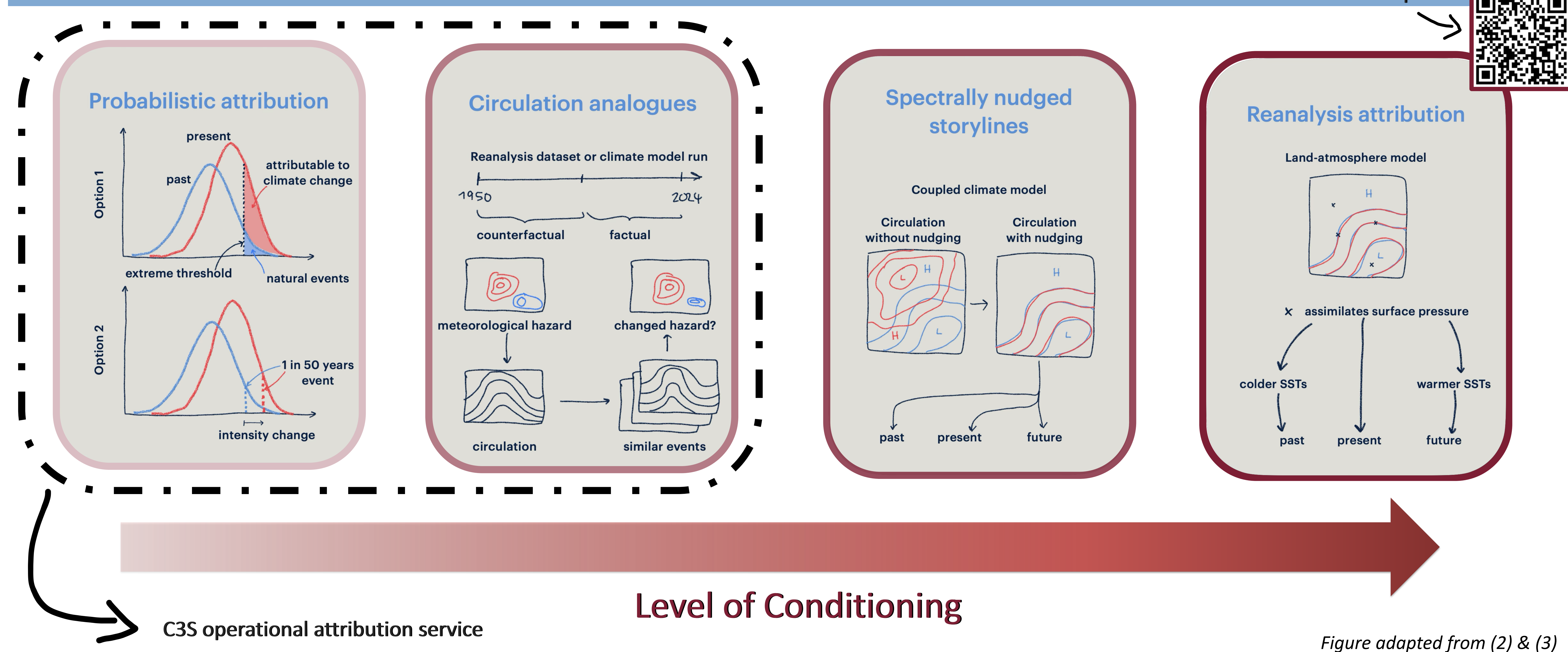
1. Jézéquel, A. et al., (2024), **Broadening the scope of anthropogenic influence in extreme event attribution**. Environ. Res.: Climate 3 042003
2. Thompson, V., Ermis, S. and Athanase, M. (2026), **The need for multi-method extreme event attribution**. Weather, 81: 40-45. <https://doi.org/10.1002/wea.7779>
3. Thompson, V., et al. **ReBASE: Storylines of Extreme Weather Events in Alternative Climates**. 2026, [https://vikki-thompson.github.io/images/ReBASE\\_poster.pdf](https://vikki-thompson.github.io/images/ReBASE_poster.pdf)
4. Amal John, Sebastian Beyer, Marylou Athanase, et al. **Global Storyline Simulations at the Kilometre-scale**. ESS Open Archive. 14 November 2024. DOI: <https://doi.org/10.22541/essoar.173160166.64258929/v1>

## Contact me!

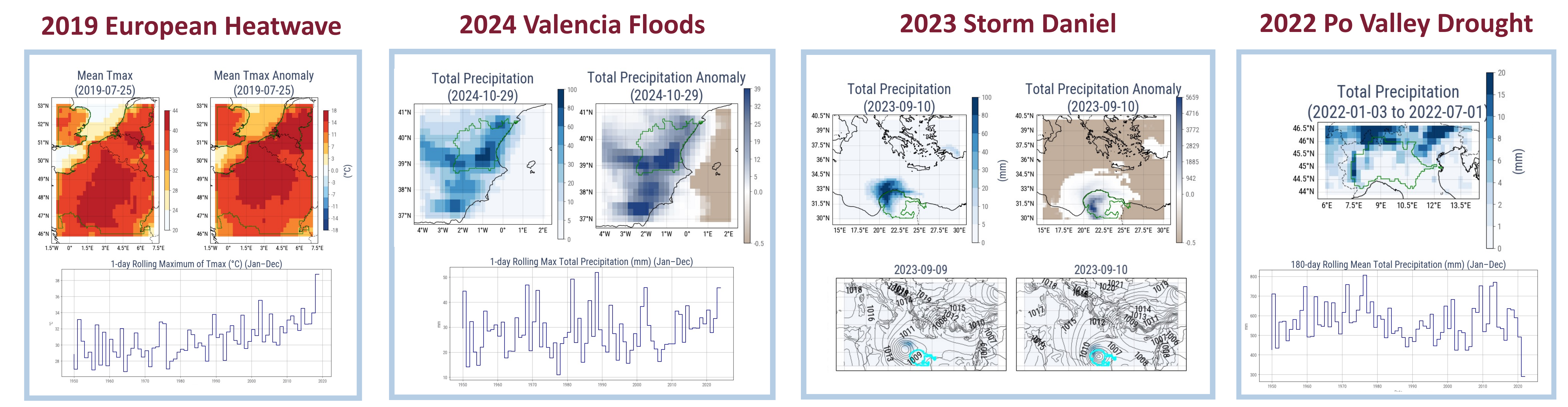
Do you have an **additional attribution method** and would you like to **contribute** to our comparison? Scan to email me [t.happe@vu.nl](mailto:t.happe@vu.nl)



## Attribution methods



## Events to be studied (preliminary selection)



to be continued...