How to prepare for record-shattering hot events

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The Netherlands seems to be sensitive to record-shattering hot events, but has not yet experienced one. To be prepared, we need to know what these record-shattering events look like and what the consequences are.

There are multiple lines of evidence pointing towards a large potential for record-shattering heat in Amsterdam.

This will increase the pressure on all parts of society and, in combination, disrupt daily life.

Researching record-shattering events and visualizing the impacts are important to raise awareness among scientists and professionals and prepare for exceptional hot events.

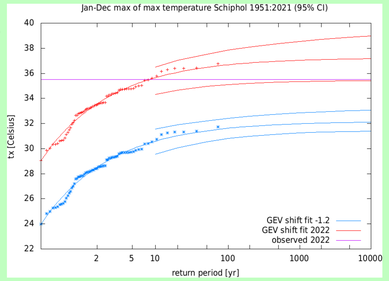
Multiple lines of evidence with an alerting heat signal for Amsterdam

1. Observations and extreme value statistics
- Record-shattering events have happened elsewhere
- Large trend in station data of Amsterdam (Schiphol)

2. Weather models
- Extreme heat has already been forecast (UNSEEN: SEAS5)

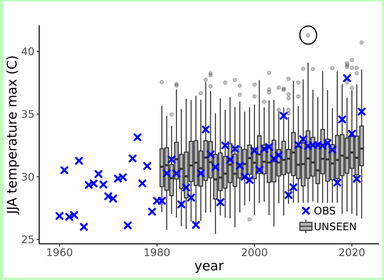
3. Climate models
- The Netherlands is a hotspot (in CESM1.2; Fischer et al., 2021)

1.



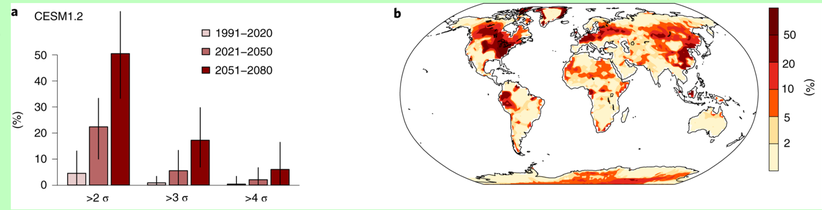
Jan-Dec max of max temperature Schiphol 1951:2021 (95% CI) with the effects of Global mean surface temperature (smoothed) linearly subtracted from the position parameter μ, referenced at -1.2 and 2022 (KNMI Climate Explorer, as in Philip et al., 2022).

2.

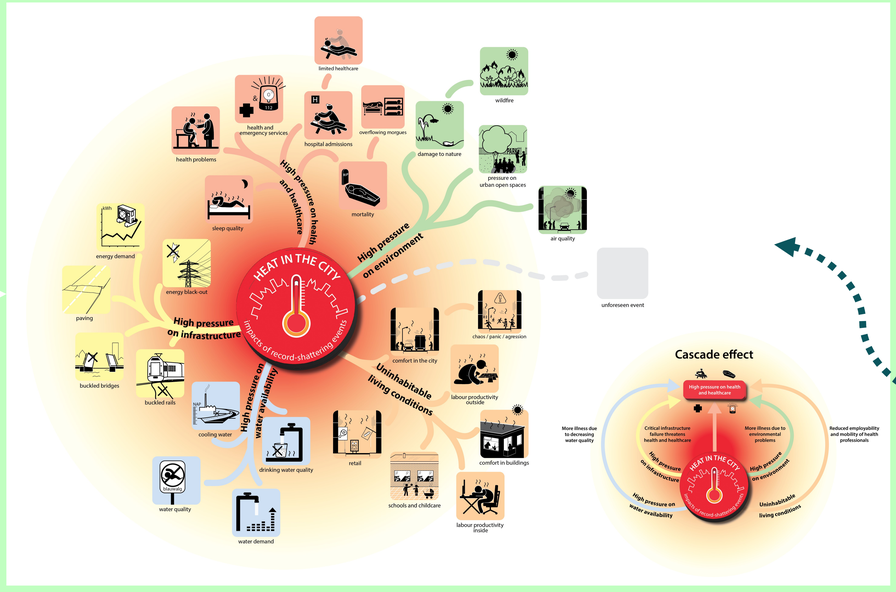


Summer maximum temperatures in ERA5 (OBS, blue crosses) and in SEAS5 (UNSEEN, grey boxplots) for a 1° grid cell over Amsterdam. Boxplots show the median; IQR; 1.5× IQR; and outliers (UNSEEN open, as in Kelder et al., 2022).

3.



a Annual probability of at least one record-shatterlng event per year anywhere over a land area larger than 70,000 km^2 in the nothern midlatltudes (30—65' N) in the 84-member CESM1.2 ensemble for three different periods and event magnitudes in RCP 850 **b**, Probability of at least one record-shattering event that breaks the previous record in the respective simulation by at least two standard deviations the period 2051—2080 (Fischer et al., 2021).



This mind-map, based on Klok and Kluck (2016), shows the expected impacts and cascade effects of a record-shattering hot event for Amsterdam. The impacts were identified during a workshop with professionals from various disciplines.

Please grab a post-it and add your ideas on the lines of evidence or make suggestions to the mind-map.

References

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