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The extreme warm summer 2018 in Sweden - set in a historical context

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Long-lasting high-pressure dominated weather resulting in remarkably warm and dry conditions in large parts of northern Europe during summer 2018. As a consequence, Sweden experienced a very long warm period with an unusual high number of warm days, which could be felt in many parts of the society. Groundwater shortage, many extensive forest fires (requiring assistance on European scale), health impacts on people, drought related shortage of food for livestock leading to emergency slaughter in many regions. According to SMHI's weather observations the average over Sweden for the four-month period May-August was on average 3.3K warmer than the 1961-1990 climatological mean.

Here, we evaluate climate conditions in Sweden during the summer 2018 in relation to the historical climate, reaching back to pre-industrial times. Basing the evaluation on long observation time series (150 years for some station across Sweden, and 250 years for Stockholm) as well as on 5 large ensembles from different global models, we want to assess to what extent an extreme event like the summer of 2018 may have changed as a result of global warming.

To grasp the character of summer 2018, not only daily values are considered, but also periods of heat days and heat indices describing the amplitude and length of an event.

With the extended length of the summer season, on account of an exceptional warm May, 2018 sets its record for many heat related indices and would have very unlikely been observed in pre-industrial times according to the given model data.