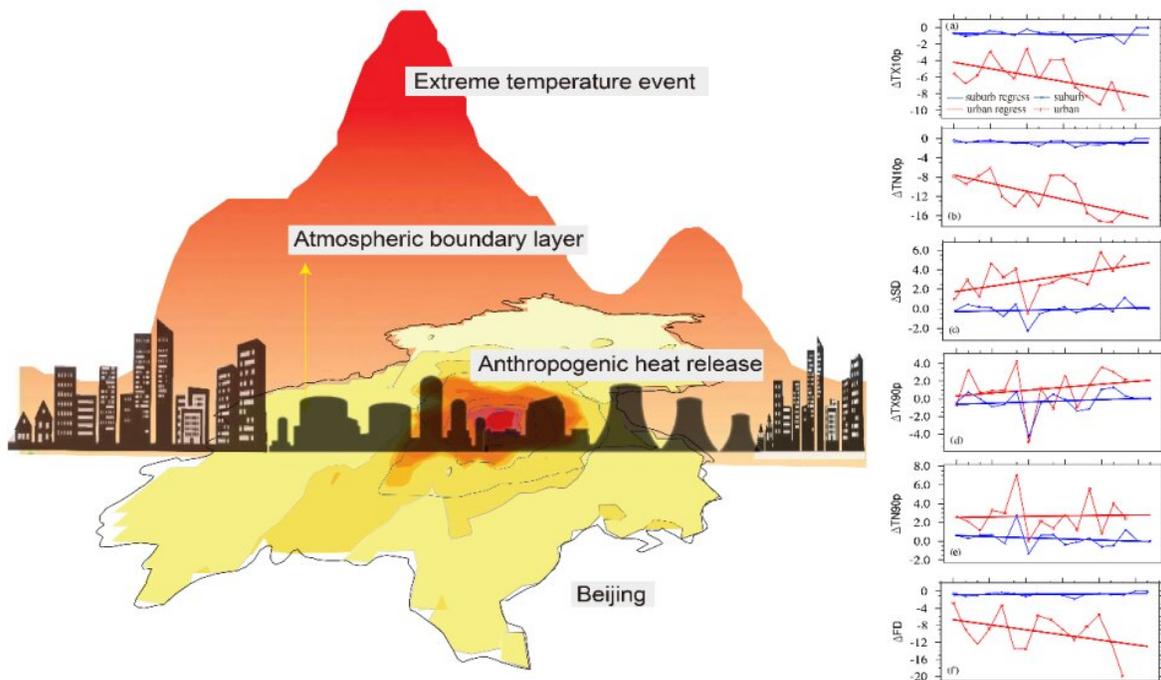


# Anthropogenic heat flux increases frequency of extreme heat events

January 12 2021, by Li Yuan



Anthropogenic heat flux reduces extreme cold events and increases the extreme heat events. Credit: LIU Bin

Anthropogenic, or human-made, heat flux in the near-surface atmosphere has changed urban thermal environments.

Meanwhile, the number of extreme temperature events in the first

decade of the 21st century grew faster than in the last 10 years of the 20th century. During this period, urban extreme heat events have become more frequent, breaking temperature records more often.

"We found the relationships between anthropogenic [heat flux](#) and extreme temperature events, including both extreme cold and heat events, based on seven extreme temperature indices by conducting the advanced model," said Prof. Xie Zhenghui, a scientist with the Institute of Atmospheric Physics (IAP) of the Chinese Academy of Sciences.

Many researchers have studied urban extreme temperature events, including the heat effect of the anthropogenic heat flux from different time scales, [urban heat island effect](#), and the synergistic interactions between [urban heat island](#) and heat waves. However, the relationships between anthropogenic heat flux and extreme temperature events have been less studied.

"Anthropogenic heat increased the frequency and trend of the extreme heat events, while the extreme cold events were opposite," said Prof. Xie. Along with Dr. Liu Bin, Xie developed a case study of Beijing, China, analyzing anthropogenic heat data based on energy consumption. Using the Advanced Research (ARW) version of the Weather Research and Forecasting (WRF) model, they implemented a dynamic representation scheme of urban anthropogenic [heat](#) release.

Their study was published in *Advances in Atmospheric Sciences* on Jan. 8.

By analyzing the dynamic process of atmosphere's [boundary layer](#), the team also found differences in seasonal heating efficiency. This research might help to mitigate the impact of extreme temperature events in different seasons.

**More information:** Bin Liu et al. Increases in Anthropogenic Heat

Release from Energy Consumption Lead to More Frequent Extreme Heat Events in Urban Cities, *Advances in Atmospheric Sciences* (2021).  
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