EGU21-3258
https://doi.org/10.5194/egusphere-egu21-3258
EGU General Assembly 2021


# Hottest drought temperature anomalies in sub-humid regions

**Sungmin Oh**, Ana Bastos, Markus Reichstein, Wantong Li, Jasper Denissen, Hanna Graefen, and Rene Orth
Max Planck Institute for Biogeochemistry, Jena, Germany (sungmin.o@bgc-jena.mpg.de)

Droughts cause serious environmental and societal impacts, often aggravated by simultaneously occurring heat waves. Climate model projections suggest that droughts and high temperatures will further intensify over the next century. Thus, understanding the underlying mechanisms responsible for drought-induced heat is crucial to inform drought management strategies and to improve prediction of dry-hot extremes, especially under a changing climate. Using observation-based, global data over 2001-2015, we show hottest temperature anomalies during droughts in sub-humid and tree-dominated regions. This is mainly driven by a drought-related net radiation surplus and further amplified by forests' water saving strategies that result in diminished evaporative cooling. By contrast, in semi-arid and short-vegetation regions, drought-related temperature increases are smaller. The reduction of evaporative cooling is weak and net radiation increases only marginally due to higher albedo over drought-stressed vegetation. As a result, our findings show the relative roles of climate and vegetation in shaping drought-heat extremes across space and highlight the importance of considering all interacting factors in understanding concurrent drought-heat extremes.