## CPAESS Discovery Seminars



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### Will the North Asian taiga become too hot for trees to capture carbon?

### DATE: Wed, March 23, 2022 TIME: 11:00 AM - 12:00 PM MST (VIRTUAL) WATCH THE LIVE WEBCAST

Summertime extreme heat events are becoming increasingly common in the taiga or boreal biome of North Asia. Better quantification of vegetation physiology and its thermal tolerance is needed to predict ecological change under a warming climate. Here we report that Siberian Larch (Larix sibirica), a keystone species of the North Asian taiga, has the highest photosynthetic performance among co-located species in North Mongolia. However, despite its photosynthetic performance, L. sibirica has a low thermal tolerance of photosynthesis (Tcrit), indicating susceptibility to irreversible damage from heat events and climate change. L. sibirica's relatively low Tcrit is likely attributable to North Mongolia forming the southern range limit of its distribution. Projections using Earth System Models (ESMs) participating in CMIP6 suggest that increases the temperature of the hottest days (Txx) might cause leaf temperatures to exceed L. sibirica's Tcrit under high emission scenarios (SSP5-8.5 and SSP3-7.0) in the second half of this century. However, this likelihood will be considerably reduced under lower emissions trajectories (SSP2-4.5 and SSP1-2.6). This work highlights the potential of crossing ecological tipping points in the taiga-steppe transition zone without emission reductions.



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