

Earth's land is drying as it warms, but it is not clear how dry is too dry

June 5 2023, by Rachel Fritts



Credit: [Water Resources Mission Area, USGS](#)

When soil moisture is low, evaporation is limited. The conditions of this moisture-limited regime can exacerbate extreme weather events, including droughts and heat waves. In a new study, Hsin Hsu and colleagues quantify how global warming affects soil moisture. Although climate change will dehydrate soil, they found, it is not clear how dry is too dry. The findings are published in the journal *Earth's Future*.

The team examined several Coupled Model Intercomparison Project Phase 6 (CMIP6) climate models and found that if carbon dioxide increased by 1% every year, after about 125 years, soils would dry and the world would become much more moisture limited. Still, the models disagreed on the threshold at which Earth would become a more moisture-limited system—a value called critical soil moisture. That threshold depends on myriad factors both on land and in the atmosphere.

Critical [soil moisture](#) has wide-ranging impacts on the water cycle, climate, ecosystems, and society. Getting a solid grasp on that value would improve [climate models](#) and paint a fuller picture of Earth's future.

More information: Hsin Hsu et al, Uncertainty in Projected Critical Soil Moisture Values in CMIP6 Affects the Interpretation of a More Moisture-Limited World, *Earth's Future* (2023). [DOI: 10.1029/2023EF003511](#)

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