

High Resolution Paleoclimate Evidence for Droughts and Pluvials During the Common Era

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A network of more than a thousand tree-ring chronologies across the Northern Hemisphere provides precisely dated annual resolution data on past droughts and pluvials spanning the last two thousand years (the Common Era). Hydroclimate reconstructions using these proxies consistently reveal epochs of anomalously dry and wet conditions of substantially greater magnitude and duration than those recorded over the last century of direct observations. Using networks of tree-ring chronologies from North America, Eurasia, and Africa, we identify the extent and duration of these events, and link their spatiotemporal fingerprint to large-scale modes of ocean-atmosphere variability. Pan Pacific drought and pluvial patterns are linked to interannual and decadal variability in the El Nino-Southern Oscillation, while rare but severe periods of synchronous North American and Monsoon Asian 'megadrought' reveal additional influences. Proxy data at these timescales and with this chronological precision provide the opportunity to understand the ways in which the ocean influences the terrestrial water cycle at timescales from years to centuries.