

A 22,000-year record of monsoonal precipitation from northern Chile's Atacama Desert

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Fossil rodent middens and wetland deposits from the central Atacama Desert (22° to 24°S) indicate increasing summer precipitation, grass cover, and groundwater levels from 16.2 to 10.5 calendar kiloyears before present (ky B.P.). Higher elevation shrubs and summer-flowering grasses expanded downslope across what is now the edge of Absolute Desert, a broad expanse now largely devoid of rainfall and vegetation. Paradoxically, this pluvial period coincided with the summer insolation minimum and reduced adiabatic heating over the central Andes. Summer precipitation over the central Andes and central Atacama may depend on remote teleconnections between seasonal insolation forcing in both hemispheres, the Asian monsoon, and Pacific sea surface temperature gradients. A less pronounced episode of higher groundwater levels in the central Atacama from 8 to 3 ky B.P. conflicts with an extreme lowstand of Lake Titicaca, indicating either different climatic forcing or different response times and se