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Paleodata compared with model simulations of the LGM climate of western North America

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The physiography western North America is complex, and it is often difficult to correctly simulate the climate of this region. Today there are strong gradients between maritime climates bordering the Pacific Ocean and the dry continental climates of the interior. The USA-Mexico border region today has mild winters, while the northern interior region can experience very harsh winter temperatures. The LGM landscape differed from that of today in many aspects, including: continental glaciers reached from Canada into the USA, ice caps and montane glaciers covered many of the highest mountain ranges of the western USA, and, lakes and wetlands occurred in many of the now-dry intermontane valleys. Plant species were displaced southward and down in elevation, relative to their modern distributions. Biome reconstructions suggest that the LGM vegetation of the interior was semiarid, as it is today (although this interpretation is confounded by potential changes in plant-water relations related to changes in the concentration of atmospheric carbon dioxide). In any case, the present-day southwestern USA is one of the few places where the reconstructed LGM climates was wetter than the climate of today. Summer temperatures were cooler-than-present across the latitudinal gradient, and winter temperatures were colder-than-present in most of the region. However, the winter temperature anomalies in the USA-Mexico border region were not as large as those farther north. Model simulations of the LGM climate capture many of these aspects of the paleoclimate, although in some cases the simulated conditions are wetter than reconstructed from paleodata.