



North American regional climate reconstruction from underground temperatures.

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Within the framework of the PAGES NorthAmerica2k project, 514 North American temperature-depth profiles were analyzed to infer recent climate changes. The ground surface temperature (GST) histories for the last 500 years were reconstructed from the subsurface temperature anomalies using a singular value decomposition (SVD) inversion that retains four principal components and takes into account time logging differences. Steady-state surface temperature and thermal gradient were estimated by linear regression for the lower 100 meters of the temperature profile, and climate induced subsurface temperature anomalies were estimated as departures from the steady-state conditions. Additionally, a Monte-Carlo method was used to find the range of solutions within a maximum subsurface anomaly error determined by the minimum distance between the model and the data. A regional analysis was performed for the last 5 centuries yielding mean temperature change every 50 years. The GST history results, presented as the mean and 95% confidence interval, show a warming by 1.0°C to 2.5°C during the post industrial era.