Assimilation of the Ocean2k marine surface temperature database into an intermediate complexity climate model

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We perform a simple data assimilation exercise using a recently developed database of sea surface temperature reconstructions, the LOVECLIM earth system model of intermediate complexity (EMIC) with realistic external radiative forcing, and the particle filter data assimilation method to explore the temporal and spatial structure of marine surface temperature variation over the past two millennia. We will compare results to previously published global composite analysis of the same data, and with proxy surrogate reconstruction (PSR) results that use more realistic forward models of the paleoclimatic observations underlying the reconstructions used in this exercise. The results may inform the extent to which real information is obtained when observations are sparse, but physical climate simulations are employed as a constraint; the extent to which proxy system modeling for realistically mapping simulations to observational variables produces similar results; and whether uncertainty estimates are accurate.