



Supplementary Figure S1: **Agreement between the air temperature proposed in the present work with that of ERA5.** The index of agreement ( $\lambda$ ) proposed by Duveiller et al. (2016) is used to characterise the range between no agreement ( $\lambda = 0$ ) and total agreement ( $\lambda = 1$ ) for the following subsets: (a) time series for each spatial pixel, (b) all across space and time values falling in a specific climate bin, and (c) a spatial values in a given time frame; thereby illustrating respectively the agreement in time, in climate and in geographic space.