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# Distance optimization between neighborhoods for reference series. A case study of Spanish conterminous land

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Realistic conclusions of subregional analyses of climate change, particularly in precipitation, needs high dense and high quality data base to ensure confidence results. Thus reference series is crucial step to certify the quality control of data, but there is not global consensus about how to proceed. Selection of neighbors stations have been proposed by using correlation threshold, number of neighborhoods, minimum overlapping period, minimum distance and no global consensus has been achieved. Furthermore, the scarce results about spatial relationship between stations vary, thus accordingly spatial correlation, in Mediterranean areas of Alpine region and North Italy a minimum distance threshold between neighbors of 100 km have been suggested, while in the Mediterranean fringe of Iberian Peninsula, due to high variability of precipitation both at temporal and spatial scale, distance is reduced to 50 km.

Here we present an analysis of the relation between correlation and distance at decadal scale from 1946 to 2005 by using the MOPREDAS dataset with the aim to produce the best available reference series in the conterminous land of Spain (Iberian Peninsula). To do that we applied a model log (r2) = b * Sqr (d), with (d) distance, and mapped at different decades (1946-1955, 1956-1965, 1966-1975, 1976-1985, 1986-1995, 1996-2005) the results using the distance for correlation over 0.70 (i.e. $r2over0.50$).$Thenwepresentthespatialvariationofcorrelationsanddistancealongthedecades.$
$Accordinglytheresultsandconsideringaminimumnumberofneighbors, areferenceseriesinthestudyareashouldbecalcula$