A minimum distance optimization between neighborhoods for reference series in Western Mediterranean.

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Subregional analyses of climate change needs high quality data base to ensure realistic conclusions and quality control is a critical step in which reference series is crucial. Notwithstanding, there is not global consensus about how to proceed (correlation threshold, number of neighborhoods, minimum overlapping period, minimum distance). In Mediterranean areas of Alpine region and North Italy a minimum distance of 100 km have been suggested, but many other Mediterranean regionas have not been explored. In the Mediterranean areas of Spain (mainly east coastland and NE inland) rainfall is highly variable both at temporal and spatial scale, thus the relation between correlation and distance could vary. We have tried to determine the relationship (at decadal and 1951-2000 period) between correlation and distance in the Mediterranean areas of Spain for produce the best available reference series. To do that we applied a model $\log (r^2) = b * Sqr (d)$, with (d) distance, and mapped the results using the distance for correlation over 0.70 (i.e.: r^2 over 0.50). In 90% of area analyzed, correlation over 0.70 are only detected under distance of 70 km. Spatial variability is high, and lesser distance were found in areas such as littoral of Valencia Gulf (50 km). Temporal variations were also detected. The 80´s were extremely variables (d <50km) while 50´s were very stables (d > 50km). Accordingly the results and considering a minimum number of neighborhoods, a reference series in the study area should be calculated following the minimum value presented in the maps. A mean value in the study area is 50 km, this value is suggested for future series of reference in the study area, and should be contrasted in other similar areas of Mediterranean basin.