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High resolution reconstruction of monthly autumn and winter precipitation of Iberian Peninsula for last 150 years.

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Precipitation over Iberian Peninsula (IP) presents large values of interannual variability and large spatial contrasts between wet mountainous regions in the north and dry regions in the southern plains. Unlike other European regions, IP was poorly monitored for precipitation during 19th century. Here we present a new approach to fill this gap.
A set of 26 atmospheric circulation weather types (Trigo R.M. and DaCamara C.C., 2000) derived from a recent SLP dataset, the EMULATE (European and North Atlantic daily to multidecadal climate variability) Project, was used to reconstruct Iberian monthly precipitation from October to March during 1851-1947. Principal Component Regression Analysis was chosen to develop monthly precipitation reconstruction back to 1851 and calibrated over 1948-2003 period for 3030 monthly precipitation series of high-density homogenized MOPREDAS (Monthly Precipitation Database for Spain and Portugal) database. Validation was conducted over 1920-1947 at 15 key site locations.
Results show high model performance for selected months, with a mean coefficient of variation (CV) around 0.6 during validation period. Lower CV values were achieved in western area of IP.

Trigo, R. M., and DaCamara, C.C., 2000: "Circulation weather types and their impact on the precipitation regime in Portugal". Int. J. Climatol., 20, 1559–1581.