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The London and Paris Daily Pressure Series, 1692–2007: the development of two new data series.

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It has been known for some time that the potential exists to create long daily series of pressure for the cities of London and Paris by piecing together the barometer readings from various observers and institutions. However, most of the readings prior to 1920 have not previously been digitized or converted to modern units. To rectify this, work began in 2006 to locate and digitize these observations and then to correct the data to form homogeneous series of pressure. Observations have been located to span the years 1670–2007 for Paris and 1692–2007 for London, although significant gaps exist for the periods 1726–47 (Paris) and 1717–22 (London) where no daily pressure observations appear to have survived. The barometer observations were subjected to a detailed quality control procedure before being corrected to represent daily means of sea-level pressure at standard conditions. Monthly and annual means were calculated from the daily data and the homogeneity of these data series over the period 1780–2007 was assessed by using the Penalized Maximal *t* test through the use of several reference series. The homogeneity of the pre-1780 period, in the absence of highly correlated reference series, was tested by using the Penalized Maximal F test. Both of these tests were implemented through the RHtest V2 software package and it thus appears to be one of the first applications of this software to the homogenization of long pressure series. During this homogenization procedure, the London and Paris series were kept separate to avoid the introduction of circular relationships in subsequent analyses. In addition to the increased resolution and the extended length of these new series, the data are considered to be an improvement in terms of homogeneity over the monthly resolution London and Paris pressure series previously developed under the ADVICE project. In particular, the overall mean of the new London series is approximately 1hPa lower than that of the ADVICE London series; this is more in keeping with surrounding stations. In general, the focusing upon the correction/homogenization of only two station series has allowed the thorough searching of meta-data for the adjustment of the detected breakpoints. As such the majority of the identified breakpoints are Type-0, i.e. they are supported by meta-data. The small number of Type-1 (unknown) breakpoints – one for London and four for Paris – have been traced to individual days by scrutinizing the daily series.