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TRENDS AND VARIATIONS IN PRECIPITATION IN AUSTRIA SINCE 1845

ABSTRACT: With the help of 62 homogenized time series the temporal variations in precipitation are presented for 11 grid points over Austria. The grid point distance was chosen 1 degree longitude and latitude. As an arithmetic mean of these grid points a mean Austrian precipitation series was calculated. Its representation for Austria and its temporal course in comparison with European and global changes are discussed.

Introduction

Continuous, standardized precipitation measurements started in Austria in the early 19th century. An uninterrupted time series beginning in 1820 is existing of Kremsmünster; older data of some other places are available, but unfortunately not in the form of complete data sets. Moreover, it is important that we know very much about the "station history" of Kremsmünster, which we owe to the monks of the Benedictine Monastery of the astronomical observatory (Wagner 1888). For example, a drastic change took place in 1872 when the orifice of the rain gauge changed from 275 cm^2 to 1000 cm^2. This points out that rain gauges have changed radically in Austria within the last 170 years. That refers especially to the progressing exchange of traditional rain gauges for automatic measuring systems, which started around 1980. Thus, precipitation time series have to be tested for homogeneity before one can start with time series analyses.

Homogenization of long term precipitation series

To detect all the inhomogeneities in the long term series a method shown by Craddock (1979) was used. For each single year term s has to be calculated after the formula:

$$s_i = s_{i-1} + (b_m/a_m) \cdot a_i - b_i$$