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Long term variability of precipitation deficits in Poland

I. Pińskwar and M. Szwed

Research Centre of Agricultural and Forest Environment, Polish Academy of Sciences, Poznan, Poland (iwonap@man.poznan.pl)

In the present climate, many regions in Poland suffer shortages of water, especially in the growing season. In the light of climate projections for the future, these shortages may be even more frequent and more severe. This study will use the Standardized Precipitation Index (SPI) to estimate the precipitation deficit. The SPI was designed to quantify the precipitation deficit for multiple time scales. It helps to assess drought severity. The SPI calculation for any location is based on the long term precipitation record for a selected period.

In this study, the values of the SPI index for the 3-, 6- and 12-month periods observed at 13 rain gauges in Poland will be examined based on real daily precipitation data for the 50-year period: 1956-2005. The SPI values will allow to indicate the periods as well the regions of Poland threatened by water stress to a greater extent.

In the next step, the values of the observed sum of precipitation for 1-, 3-, 6- and 12-month periods in the 1956-2005 will be compared with the projections of precipitation for the future (2070-2100). The values of daily precipitation for the future originate from results of the Hadley Centre HadRM3-PRECIS regional model simulations (for SRES A2 scenario in three model experiments).

For both periods, for the present as well for the future, the variability ranges of precipitation (e.g. maximum and minimum values, quartiles) will be presented. The time series of precipitation (in different time-scale steps) in order to notice the possible trends will be examined. Changes in the precipitation characteristics in the present and in the future will be analyzed using statistical tests.