

The paper focuses on the analysis of future changes in rainfall characteristics. The study was performed in the mountainous region in the central part of Slovakia at the Telgárt climatological station.

The Community Land Model (CLM) scenario was used to represent the climate change on the short-term rainfall data. The CLM model developed in the USA (rok) explains the impacts of changes in vegetation on the climate. The scenario has semi-pessimistic characteristics with a predicted global temperature increase by 2.9°C by 2100.

The analysis was performed on following rainfall durations (60, 120, 180, 240, and 1440 minutes) for the historical (1961-2020), the near future (2030-2070), and far future (2071-2100) periods.

The main results of this study can be summarised as follows:

- Trend changes showed a nonsignificant decreasing trend for the historical and far future period. For the near future period there were a significant trends detected in the 60-, 120- and 180-minutes rainfall duration on the 90% of significance level.
- The seasonality changes for the future periods are not significant. For the future periods there is shift about 1-week to the earlier period in month of July from the historical period in the occurrence of the rainfall maxims.
- The design rainfalls were derived by scaling exponents for the historical and far future periods. The results predict in average 8% increase in the design values for the future period.

Tab. 1 Results from the trend testing

↗	- increasing trend
↘	- decreasing trend
■	- significant trend (90%)

Period (year) / Duration (min)	60	120	180	240	1440
1961-2020	↘	↘	↘	↘	↘
2031-2070	↗	↗	↗	↗	↗
2071-2100	↘	↘	↘	↘	↘

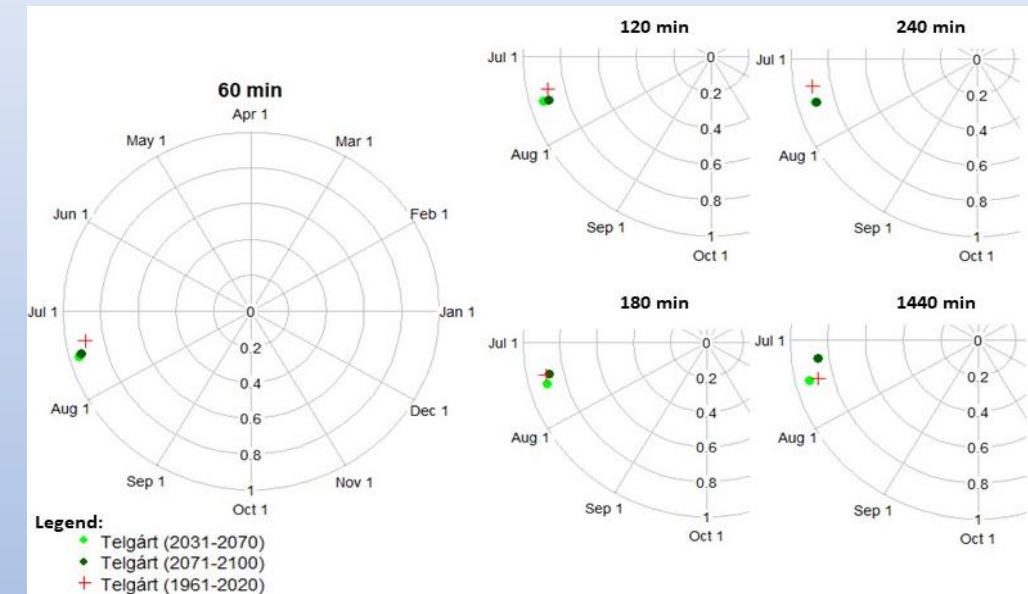


Fig. 1 – Seasonality changes in the Telgárt climatological station

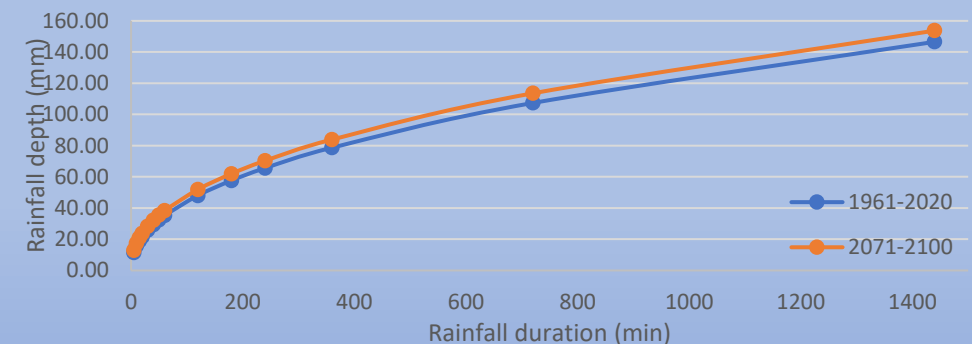


Fig. 2 – Design rainfall intensities in the Telgárt climatological station (100-year return period)