Based on the estimation of standardized precipitation index (SPI) and standardized runoff index (SRI), this study investigates the variability and correlation of hydrological drought and meteorological drought in the catchment area of the Upper Notec river, which covers an agricultural area of Poland with some of the lowest water reserves.

Trend analysis is carried out using Mann Kendal Test and Sen's slope method.

The results showed that statistically significant trends were identified at 3 out of 8 meteorological stations (downward trend at one station and upward trend for drought at 2 stations). As far as hydrological droughts are concerned, a statistically significant upward trend is observed at one station, one significant downward trend is noted at one station and no trend was found at one station.

In the opinion of the reviewer, the submitted manuscript may hold the potential to be suitable for publication in Atmosphere subject to several recommended modifications.

Line 14 Abstract

The case study focuses on the catchment of the Upper Notec river, which is a heavily exploited agricultural area with some of the lowest reserves of water. The authors should convince the readers that the paper can be original, and valuable contribution not to a particular region only.

Line 97 Fig.1

Where is the Notec River?

Line 143 Fig.2

Why is the average annual air temperature represented as continuous line and average precipitation sums as a bar graph?

Line 163

Short definition of SPI could be helpful

Line 169

Why f is not defined. f is different for precipitation and discharge

Line 178

Wrong reference

Line 179

How are determined the parameters of the logarithmic function

Line 188, Table 3

the classification scale is not defined properly (semi-infinitive intervals)

Line 220 Section 2.5

The use of the Pearson correlation coefficient requires a fundamental assumption that random variables under investigation (SPI and SRI) are linearly dependent. However, the assumption

regarding the inherently linear dependence is challenged in the Rainfall-Runoff hydrological system.

Therefore, the Pearson correlation analysis may be not well suitable for dealing with highly nonlinear relationships between SPI and SRI.

For the current study, ignoring the nonlinear dependence of the SPI on the SRI can lead to the inaccurate drought response time.

Line 270

Should these two station be excluded from the section 2.5 because of anthropogenic activities carried out in the area?

Line 303, Fig.4

Fig.4 (and Fig.5) is wrong.

Please note, that SPI is calculated in the following sequence. A monthly precipitation data set is prepared for a period of 432 months.

A set of averaging periods are selected to determine a set of time scales of period i=1,3,6,9,12 months. These represent arbitrary but typical time scales for precipitation deficits. The data set is moving in the sense that each month a new value is determined from the previous i months. So, how was calculated SPI-12 (and correlation coefficient) for 1981?

Line 324, Table 6 and Table 7

Three significant figures could be enough, e.g., 8.99e+06 not 8.988927e+06, and used everywhere.

Table could be simplified to Z, and Sen's slope. The authors do not refer to S, var_S and p-value is related to Z.

Line 341, 3.3. Correlations between SPI and SRI values

Figure 5 displays the comparisons of SPI and SRI for the five different timescales (1, 3, 6, 9, and 12 months) for the years 1981–2020. Fluctuation and variation of SPI and SRI series show consistent patterns over the study period. However, it looks like the degree of consistency changes with timescales.

The statistical result should reveal that the correlations between SPI and SRI drop from the value calculated for the 12-month timescale to the values calculated for the 9-, 6-, 3-, and 1-month timescales, indicating that the differences between the two indices increase as timescale decreases.

Line 347

In the case of individual years, the correlation indicators between hydrological and meteorological droughts are rather misleading. The highest correlation is about 0.94 and the lowest -0.9. What does it mean for decision makers?

I would suggest removing Fig.5 and examining the relationship between 1-month SRI and SPI at different Timescales (1,2,3,4..)

Due to hydrologic detention of subsurface soil moisture, shallow groundwater and perhaps reservoir storage, a 2-month timescale of SPI could be more appropriate for river discharge monitoring.

Line 389

As an increase in air temperature in the analysed area is an additional element (Fig. 2) which leads to an increase in evapotranspiration why the standardized precipitation–evapotranspiration index SPEI is not considered?

If the catchment area of the Upper Notec river requires using several indicators in order to assess the actual condition of the water reserves, why the authors limited the research to only 2 indicators. The following indices could be examined: Precipitation Concentration Index (PCI), Seasonality Index (SI), and Rainfall Anomaly Index (RAI).