

Our study investigates the connection between the NAO and GBO phenomena, which represent the pressure field gradients at the European level that capture the zonal and meridional circulation, respectively, with the drought/wetness phenomenon expressed by the PALMER indices.

How do we achieve this?

I invite you to look at the figures:

In Fig. 1. the Pearson correlations and those based on informational entropy, between the Palmer indices and the two atmospheric indices GBOI (blue) and NAOI (orange), highlight, except for the autumn season, nonlinear relationships, with a confidence level of approximately 95%.

In Fig. 3. Through a wavelet analysis, for example in winter, it can be seen that between the Palmer index and the GBOI, there is a statistically significant coherence for periods longer than 11 years.

Figures 6 and 7 present the analysis of extreme events (GEV fit) from the spring months at the Novi Sad station.

Figure 7 highlights a GEV distribution with two humps (peaks) highlighted by the impact of the winter GBO phenomenon, considered as a covariate, on the extreme spring phenomenon expressed by the Palmer index, in contrast to the GEV distribution without covariate, shown in Fig. 6.

From chaos theory, the distribution in Fig. 7 with the two humps, highlights two basins of attraction.

The second part of Fig. 7. records the “return period” with the level of return corresponding to various time intervals from 2 to 250 years.

The conclusions regarding the behavior of extreme events under NAO/GBO impact in the lower Danube basin can be seen in detail in our Poster as well as in the useful references.