Seasonal and cyclic pattern of hydrometeorological variables based on the Shannon entropy

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The Shannon entropy [2] is often used to study the randomness of natural phenomena because it enables assessment of predictability of such phenomena. A consequence of temporal variability of global and regional climatic conditions is the seasonality and cyclic behaviour of hydrometeorological variables. The Shannon conditional relative entropy was adopted by Colwell [1] for evaluation of temporal fluctuation in physical phenomena.

Temporal variability of predictability based on seasonality of temperature and precipitation at fourth stations in Poland were studied using the Colwell indices for time series of length over 100 years. A link between the variability of predictability and different climatic indices from various world regions was accounted for.

References

[1] Colwell, R.K., 1974. *Predictability, Constancy, and Contingency of Periodic Phenomena*. Ecology, 55(5), p.1148–1153.

[2] Shannon, C.E., 1948. *A Mathematical Theory of Communication*. Bell System Technical Journal, 27(3), p.379–423.