



## **Climagramms as a Possibility of Evaluation of Hazards from Agrometeorological Point of View**

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This paper focuses particularly on the graphical method representation of the drought spells, which serves modeling of the time and spatial aspects of these events. In particular, we have applied Walter-Lieth's climograms and thermopluviograms in order to monitor and analyse droughts in an agrometeorological year (i.e. including the winter season). The latter provide a new design of evaluation of longer sequences from many years of observations. In other words, long time series can be evaluated by the thermopluviogram method exactly. We are proposing thermopluviogramm, which allows a combination of both the deviation of temperature from the long-term data and the percentage of long-term amounts of precipitation to be shown in the same graph. Modeling of thermopluviogramm has not been difficult. In the centre of this diagram we have placed the long term mean (or the standard period, e.g. 1961-1990) with the following coordinates: monthly average air temperature (x-axis) and monthly amount of precipitation (y-axis). Thus, the scale on the periphery shows the air temperature deviation from the long term mean and the percentage of the long term mean precipitation sum which makes the termopluviogramm applicable to any location worldwide. The basic diagram has been arranged as follows: The x-axis shows the average air temperature, with a 0.0o C deviation from the standard period ( $\Delta t$ ) marked in the centre of the graph. Depending on the size of deviation for a given period extreme conditions are indicated on the x-axis as follows: cold, very cold, extraordinary cold, normal, warm, very warm and extraordinary warm. The y-axis shows the amount of precipitation in a similar manner: the standard period value is 100. Since the Zatec weather station is situated in the rain shadow of the "Krusne hory" (Ore Mountains) chain and is therefore in the driest region of the country, it was adopted as a reference station for the evaluations of the drought years. The assessment has been conducted on 47 years (1961-2007) of meteorological information recorded at the Czech Hydrometeorological Institute. According to Walter-Lieth's climagramms in a given part of the country, the drought spells have occurred during 59 months (which constituted 41 drought spells). Using the estimation of the statistical data on the basis of the climogramms we may distinguish 2 more cases with a total of 4-months of drought spells each, which can be divided into 1-2 periods respectively. One such case was noticed in 2003. This year the drought had begun in the month of June and had ended in October. Thus, the 2003 drought year was divided into 2 drought spells with a short interval between them. Conforming to thermopluviogramms, extraordinary drought years were recorded in the winter season for December: 2007, 1975, 1983, 1963, 1964; January: 2002, 1989, 1991 and 1971; and for February it was recorded in 1982. For the spring season extraordinary drought years were recorded in 1984 (March), 2007 and 1993 (April), 1998 (May). For the summer season extraordinary drought months were recorded only in July (1990 and 1964) and August (1973 and 2003). In the months of autumn they were recorded in October (1985) and November (2007).

Keywords: thermopluviogramms, Walter-Lieth's climagramms, drought.

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