

Microclimate and micrometeorological measurements in the Western Rhodopes – applications in climatic and geomorphological studies

Research project, contract No. 80-10-182/2022

University Fund "Scientific Research", Sofia University "St. Kliment Ohridski»

Summary

The microclimate represents the local peculiarities in the regime of the meteorological elements, determined by the non-uniformity of the territory. These features vary considerably over a short distance but are observed in the same type of climate. Global and regional climate models smooth out the differences, and thus interest in local climate studies and measurements has grown in recent years. Quality and accessible microclimatic and micrometeorological data are a prerequisite for the formation of reliable knowledge about environmental conditions or processes.

The meteorological stations included in the network of the National Institute of Meteorology and Hydrology do not cover the mountain areas densely enough to provide information on the state of the atmosphere and meteorological conditions on a micro-scale. Through the work on the current project, the scope of micrometeorological measurements in the mountains conducted by the Department of "Climatology, Hydrology and Geomorphology", Faculty of Geology and Geography of Sofia University, has been expanded. Two automatic weather stations WS2307 Technoline have been installed in the highest and lowest part of the Varkhovrashki Rid in the Western Rhodopes, as well as sensors for measuring air and soil temperature and humidity, the data from which are regularly downloaded, and the database is filled. An automatic weather station (AWS - Davis) has been purchased and is about to be installed.

The main aim of the research is to contribute to the creation of a quality meteorological database to be used for scientific research and teaching in a number of fields (eg climatology, geomorphology, hydrology, ecology, agriculture). The results of the project contribute to a better analysis of the current state of climate change on a local scale and the manifestation of adverse weather effects on the environment, human life, and economic activity.

Within the framework of the project, an online survey was conducted among farmers regarding the need for meteorological information, the occurrence of extreme weather and climate phenomena, and the effect on agriculture. Based on the research carried out, a need to improve knowledge about extreme weather phenomena and microclimatic features of the territories, measurement and collection of meteorological data, conducting interdisciplinary research, and supporting scientific research in the field of study of climate-agriculture relationships was found.

Project results dissemination

Publications

- Matev S. 2022. [Micrometeorological measurements of air temperature in part of the northern slope of the Western Rhodopes \(preliminary results\)](#). Journal of Bulgarian Geological Society. Vol. 83, book. 3. pp. 217-220.
- Matev S., Nikolova N., Krenchev D. 2022. Micrometeorological Measurements and Application of Meteorological Data in Climatic and Geomorphological Studies. Geographical Research and Cross-border Cooperation. 6-th edition. Abstract book. Craiova, 6-9 October 2022

Participation in an international conference with a presentation: The Sixth International Conference Geographical Research and Cross-Border Cooperation. Craiova, 6-8 October 2022

Participation in a national conference with a poster scientific presentation: scientific conference with international participation "Geosciences - 2022", Sofia, December 2022.

Work visit and lecture to members of the Slovak Meteorological Society on the topic "Extreme climate and weather events in Bulgaria - impact and adaptation in agriculture"

Information from meteorological measurements under the project will be included in the network of meteorological stations organized within the framework of the *FAIR NETwork of micrometeorological measurements* – COST Action № CA20108 (<https://www.fairness-ca20108.eu/>)

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