

## Mini internship at the Czech University of Life Sciences Prague, CZU

*PhD. Mihalache Andrei, Doctoral School of Applied Sciences and Engineering, Doctoral Field of Geography, "Ștefan cel Mare" University of Suceava, Romania*

Following the doctoral training internship, held between September 20 and September 29, 2025, at the Czech University of Life Sciences in Prague (CZU), under the guidance of Prof. dr. mgr. Vera Potopova, we achieved the proposed objectives through the following debates and activities:

### **A. Presentation of the climate databases used by CZU specialists for the analysis of weather and climate hazards:**

Together with the team of researchers at CZU, I organized and modeled several important databases in the study of climate risks. In addition to the sources of information I had in mind for climate change analysis, they introduced me to new platforms from which I can download climate statistical data. These include: <https://www.climrisk.eu/>, <https://www.agrorisk.cz/>, <https://ec.europa.eu/eurostat/data/database>. With the help of this new information, I will be able to develop the analysis of climate risks by deepening the analysis of the generating factors.

### **B. Climatic / agro-climatic risk indices (simple or compositional / complex) used by Czech specialists:**

Within this research direction, I have brought into discussion a series of climatic and agroclimatic indices analyzed by me to date (Standardized Precipitation Index; Standardized Precipitation and Evapotranspiration Index; Potential Evapotranspiration; Real Evapotranspiration; De Martonne Aridity Indices; Drought Coefficient; Potential Runoff Coefficient; Soil Water Deficit). I presented the results obtained, and the specialists from CZU offered me a series of recommendations. In addition to these discussions, they guided me to use other indices, including the Integrated Drought Vulnerability Index (IDVI). In order to understand the application of this index, I came up with a series of questions addressed to the specialists from the Czech Republic to apply this index in the North-East Region, Romania (RNER).

- What parameters does the IDVI index consist of? What are the differences between IDVI and DVI? What databases are used? Are these available for NUTS 2 at the Romanian or RNER level? In which section are Eurostat data found? What data is found at the European Environment Agency (EEA), is data also available for RNER at NUTS 2 level? Where are the land use data downloaded from?
- What version of ArcGis was used? What other graphic modeling programs were used? Especially radar-type ones.

- What formula was used to calculate the frequency of drought? What about the duration or intensity?
- How were all 12 indicators standardized to form the common database? How were the analysis equations constructed?

Following the questions asked, the answers received helped me understand this new index used in the analysis of drought as a climate risk, and I will apply the methodology in the area of study within my own doctoral thesis.

### **C. Studies and research that have been completed and/or published in prestigious journals:**

Together with Professor Vera Potopova and her PhD students, I had a series of discussions on the scientific articles and research she has in progress, or projects that have already been completed. The scientific experiences of the group of researchers through the discussions were a real help to me in understanding what are the strengths to follow in order to be able to publish the results obtained in prestigious journals.

### **D. New methods and techniques used during the internship:**

- knowledge and use of other statistical processing software than those used to date, with which the research group processes and illustrates data strings.
- analysis of the method of collecting field data, as well as the devices with which the laboratories of the Faculty of Agrobiology, Food and Natural Resources are equipped.
- analysis of climatic and agroclimatic risks using satellite images. Steps to follow in downloading satellite images. Sites where satellite images can be downloaded. Introduction to their use and processing for the North-East Region of Romania.

### **E. Programs used for statistical and graphical modeling during the internship:**

- climate risk analysis using new statistical, graphic and cartographic analysis programs;
- applying statistical tests regarding the homogeneity of data series, their trends, as well as programs used in forecasting and anticipation. Presentation of climate scenarios;
- presentation of sites from which statistical data useful in the analysis of climate risks and climate change can be downloaded;
- mastering some commands in the Grapher 25, XLSTAT, R Studio programs.

### **F. Recommendations in the analysis of climate risk studies in the North-East Region, Romania (RNER):**

- recommendations in the study and analysis of temperature inversions (presentation of the monitoring network);
- advice on delving deeper into certain types of climate risks: i) climate risks that cause the greatest economic damage, ii) climate risks that endanger human health.

- discussions with climatological specialists from the CZU, regarding their opinions on climate scenarios and the predictions they offer on the risk phenomena to which Central and Eastern Europe / the NE Region of Romania is prone.

### **G. Collaborations in the publication of articles covering the space between the Carpathians and the Dniester on the topic of climate change and risks.**

Regarding future collaboration in producing scientific publications together with the group of researchers from CZU, we have established 3 themes for producing scientific articles:

1. Changes in the climate complex between the Carpathians and the Dniester and their hydrological effects;
2. A comparative analysis between the Standardized Precipitation Index (SPI) and the Standardized Precipitation and Evapotranspiration Indices (SPEI);
3. Analysis of drought and its impact on agricultural crops.

Statistical processing was performed on these 3 research directions, trend and homogeneity tests were applied, as well as cartographic and graphic processing. It is next time that, together with the researchers from CZU, the processing already performed, will be analyzed in order to determine the final form of the studies for their publication, as well as the choice of the publication journal.

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**Coordinating:** Conf. univ. dr. habil. Dumitru Mihăilă

**PhD. Stud.** Mihalache Andrei

**Some images from the training session**

