



Future changes in Consecutive Dry Days index in Central Romania



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Introduction

The effects of drought play a large role in different social and economic fields, especially in agriculture, water resources and human health. The aim of this paper was to study the evolution of Consecutive Dry Days index (CDD), a precipitation-based drought agroclimatic index in Central Romania. CDD is explained as the longest dry spell or as the maximum number of consecutive dry days, when daily precipitation is lower than 1.0 mm. The importance of this precipitation-based index results from the fact that it can describe the climate of an area in terms of dryness or wetness. Depending on the season CDD occur and on its duration, the impact intensity translated in to damage to crops may vary. Briefly, the longer and more frequent CDD is, the proner to drought the area is.

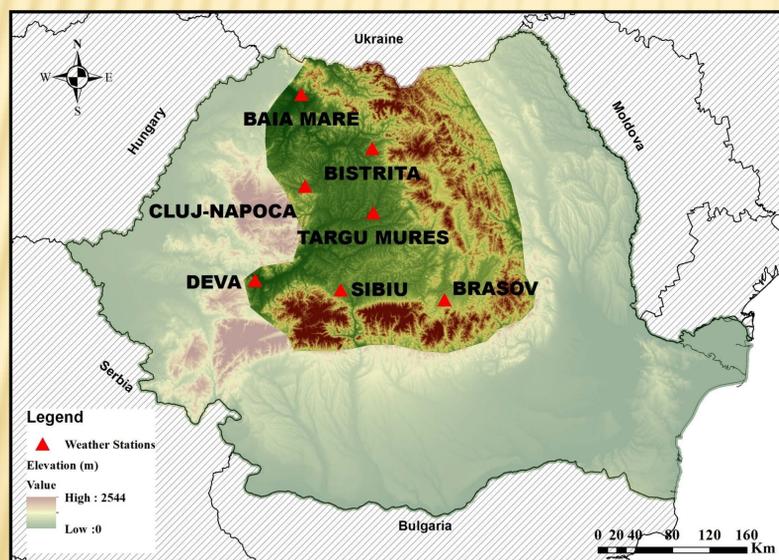


Fig. 1. Study area

Data and methods

Data

In this paper, we investigated the changes produced both in present (1981-2010) and future (2021-2100) climate based on historical and projected daily precipitation dataset. For the historical period, climate observed data from seven weather stations was used, while for the future climate, data extracted from three regional climate models outputs (ALADIN, RCA4, and WRF331F) under RCP 4.5 and 8.5 scenarios were employed.

Methods

In order to calculate CDD, ClimPACT2 software was used. The index was calculated at both annual and monthly/seasonal time scales.

Acknowledgment

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Results

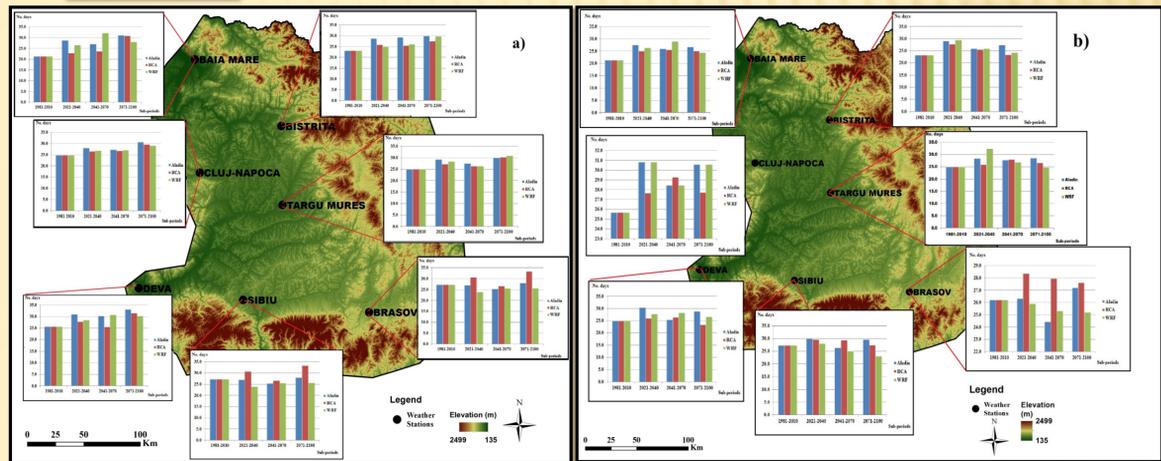


Fig. 2. Future changes in annual CDD
a)RCP 4.5 b) RCP 8.5

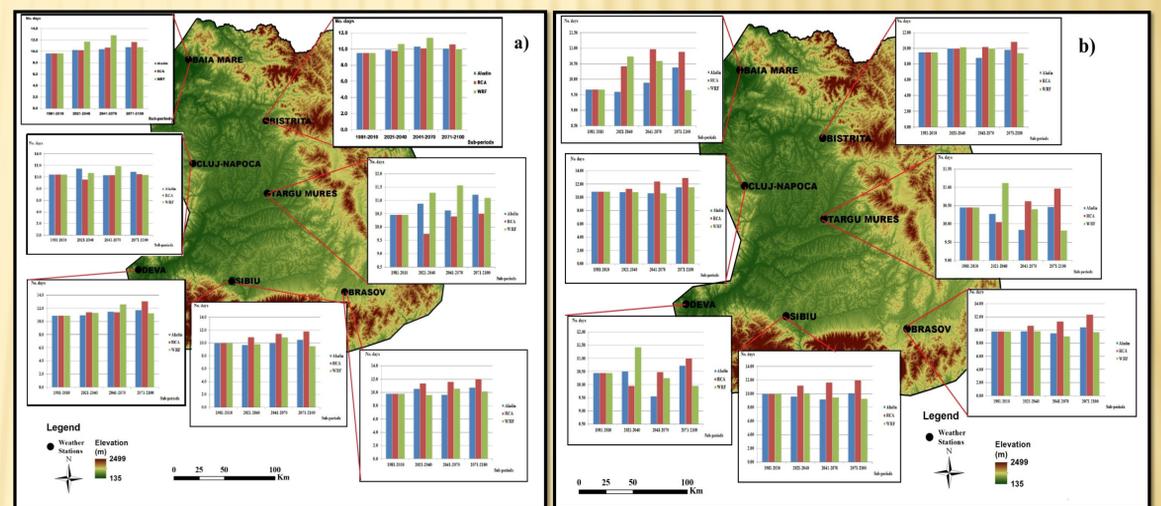


Fig. 3. Future changes in CDD for warm season
a)RCP 4.5 b) RCP 8.5

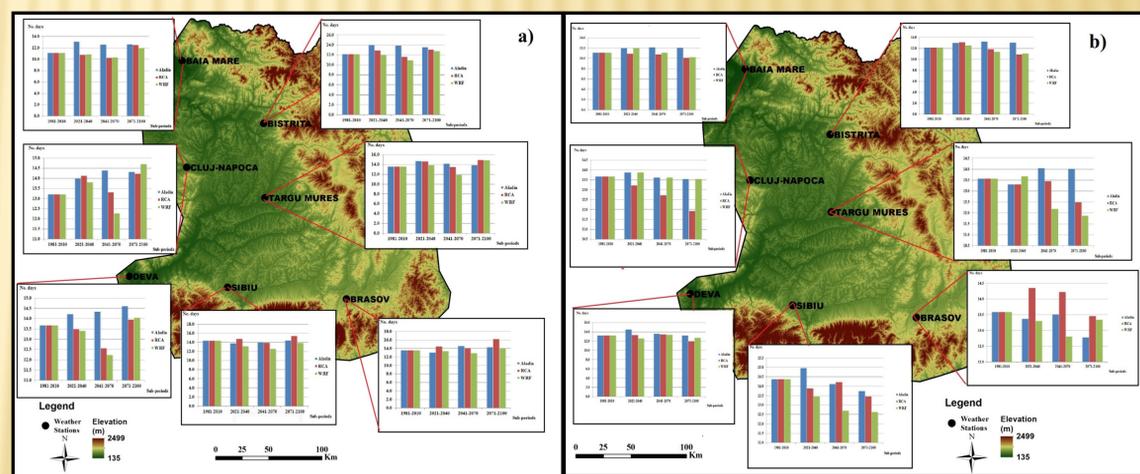


Fig. 4. Future changes in CDD for cold season
a)RCP 4.5 b) RCP 8.5

Conclusion

The main finding of this paper is that changes in CDD showed an increase in both annual and seasonal mean duration. Depending on the regional climate models and scenario used, the results differ, but even so, they are mostly consequent in terms of time scale. Regarding the length of the index, comparative with the warm season, in the cold season CDD has a longer duration.