

Poster presentation - SCA method in climate change research

Session 7 - Adapting Future Agricultural Production to Climate.

With the SCA method (spatial climate analogy) we can search for areas which present climate is similar to our study area's in the future, or which area's future climate will be similar to our study area's present climate. For the calculation we used the CRU climatic database with 10 minutes spatial resolution and for the climate scenarios the TYN SC 1.01 database. The base period was from 1961-1990, for the climate scenarios we used the time periods from 2011-2040, 2041-2070 and 2071-2100. From that databases we used only the temperature and precipitation monthly averages. We developed this new method by generalizing it with a new λ parameter. We can search for analogue areas only by the temperature or the precipitation. With this new method we can weight the temperature and the precipitation. Our study area was Debrecen in Hungary, which is an agriculturally important area. From the analogue areas we were characterizing the analogue NUTS2 regions. To analyse the analogue regions and our study area, we collected all the open access agricultural data from the EUROSTAT database and from the CORINE 2000 database.

We state, that the analogue regions to Debrecen in the next decades will be 250-450 kms south to Hungary, for the middle of the century this shifting is 450-650 kms. This regions are in Serbia, South-Romania, North-Bulgaria (YU003, RO03, RO04, BG11, BG12). For 2041-2070 period the analogue regions are in Middle-Bulgaria and Greece (BG22, GR12). For the 2071-2100 period there are no analogue regions in Europe, only in North-Africa.

The north analogue regions are in Poland. For the 2011-2040 period the regions are the PL11, PL41, PL43, for the 2041-2070 period are the PL61, PL12, PL31 regions. The analogue regions are differ to the different scenarios and for different periods. For the closest periods the scenarios are mostly shows the same regions, the differences between them are more significant in later periods.

From the land use of different analogues regions we can say that the forest and the pasture is more important. The diversity of the regions are the same or higher than in Hungary. The ratio of maize and wheat is higher than in Hungary in 2011-2040, and lower in 2041-2070. We can say that the yields are higher in the lower used crops. The comparison of analogue regions are good only for state general statements, for further analysis we need more research. We can't eliminate the social behaviour of the analogue regions because they determine the land use and the crop use. Analysing the natural vegetation, we can say, that coverages of the natural vegetation is higher in the analogue regions than in Hungary. To the north the coniferous woods to the south is the deciduous woods are the dominant. Only in the greek regions the sclerophyll vegetation is the dominant. The biogeographical zonality shows that Hungary in a worth position, because all the other region are in a different biogeographical zone, so for a small changes we run out of our region.

References:

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