https://gisportal.wordpress.com/

Software spotlight - Diva-GIS

DIVA-GIS is a free software developed by CGIAR (Consultative Group on International Agricultural Research) and the University of Berkley. It is an effective tool for mapping climate geographical data, especially for biodiversity and agricultural research.

The software uses built-in tools to analyze and model distribution of organisms to identify geographic and ecological patterns.

DIVA-GIS has some unique tools, it can:

1. Predict species distributions using the WorldClim database and create ecological niche modeling.
2. Display information about hundreds of different crops and predict their adaptation to different climates, using EcoCrop model.

In this newsletter, I will show how we can use WorldClim and Ecocrop to predict areas suitable for growing “Club Wheat” in Manitoba:

1. **WorldClim**

WorldClim is a set of global climate layers with different spatial resolutions. The model uses these layers to illustrate climate by geographic coordinates (see Figure 1):

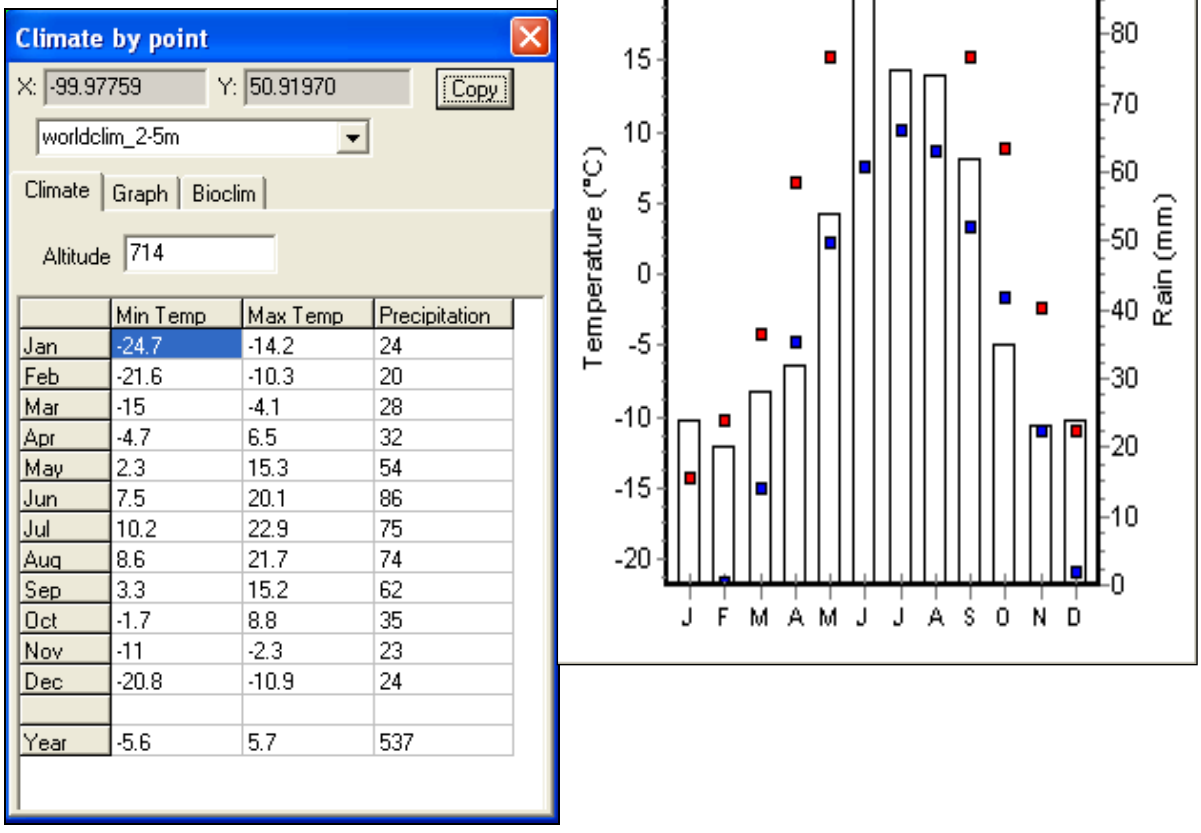

Figure 1: Climate by point, numerical(left) or graphical (right). The database is covering both historic and future predication climate data, covering most of the globe.

2. EcoCrop:

EcoCrop model has over 1700 different crops in its database. Each crop has diifrent variables which are the basis of creating suitability maps according to climate variables.

Case Study – Wheat in Manitoba:

To show how the model works I will demonstrate by looking into local example. I wanted to check if I can predict where wheat will be grown in the fields surrounding Winnipeg, MB.

The model has three different species of wheat in its database. I chose “Club Wheat” (see figure 2) due to the lower temperature variables compare to other types of wheat, which will better suit the colder spring and fall in Manitoba.

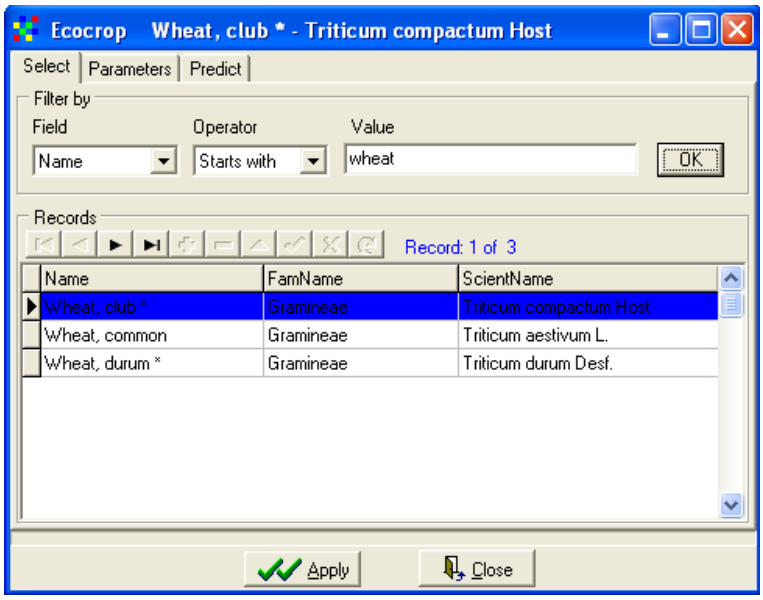

Figure 2: EcoCrop database query

The model is based on 3 variables: Length of growing season, Temperature and Precipitation.
The variables can be changed by the user, which is useful if the given data is incorrect for a certain point, or if we want to predict crop suitability which is not part of the model.
Finally, we can modify the geographic locations, and whether we base our calculations on temperature, precipitation, or both (see figure 3).

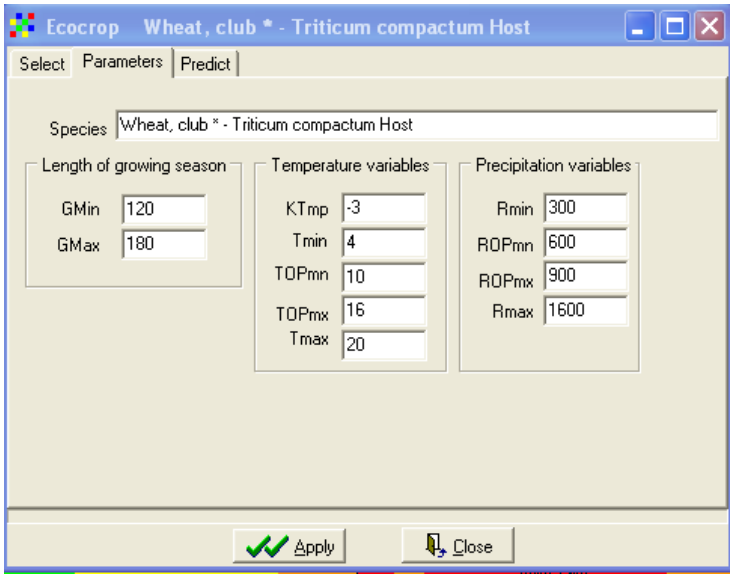

Figure 3: The parameters which the model is based on

The model analyze the WorldClim databcase. The suitable areas will be generated and illustrated on a suitability map. (Figure 4).

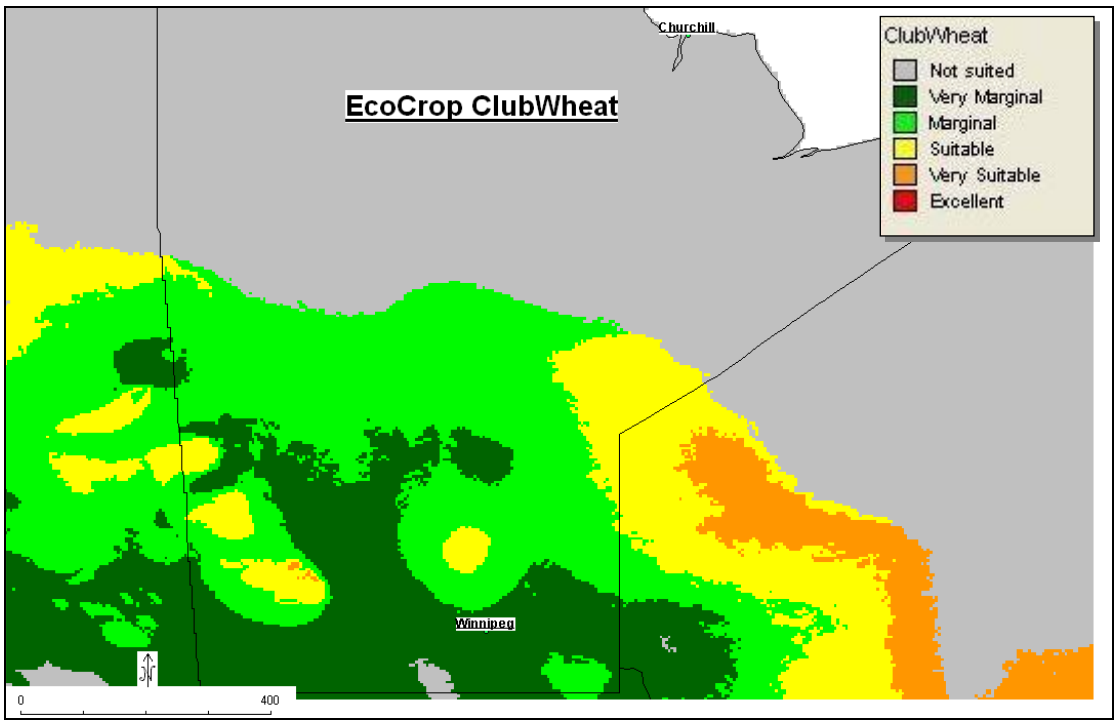

Figure 4: suitability of "Club Wheat" in Manitoba, based on EcoCrop model.

Despite low graphic capabilities of the program compare to other GIS programs, its various models and function and the ability to import/export models, makes it a useful and valuable tool for agricultural purposes.

References:

DIVA-GIS website: http://www.diva-gis.org/

Omri Makover website: https://gisportal.wordpress.com/

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