**Worksheet**

1. Study the data in the folder species. What structure do the data have?

Answer:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Run the software DIVA GIS
2. Load the climate data (worldclim)
3. Load the shapefile world\_adm0.shp (folder perigramma shp)
4. Press create shapefile and select the file Testudo.csv (*Testudo graeca*)
5. Now that we see the known species distribution we would like to model the continuous distribution area for this species. Press Modelling -> Bioclim
6. For predict we enter a name for the output file and press apply.
7. Run the model at least 3 times with climate change selected, each time altering the temperature (+1, +2, +3 °C). Does the distribution area increase or decrease?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Press Modelling -> Bioclim and select envelope (annual mean temperature and annual precipitation as variables). Apply. What do you see?

Answer:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Repeat these steps (current and future distribution) for the species *Achillea* *holosericea.*

Does the distribution area increase or decrease?

Answer:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Find the suitable areas for olive cultivation in Greece using the ecocrop function. After that load the future climate model (ccm3) and repeat the prediction.
2. Does the distribution area of suitable olive crop land change under the ccm3 climate change predictions?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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