Combining ecotope segmentation and remote sensing data for biotope and species distribution modelling

William Coos, Jessica Delangre, Julien Radoux, Marc Dufrêne
1 Biodiversity and Landscape Unit, Gembloux Agro-Bio Tech, Université de Liège
2 Earth and Life Institute, Université Catholique de Louvain-la-Neuve

Biotope and habitat suitability modelling are increasingly used in biodiversity monitoring and conservation planning. However, ecological modelling requires an extensive amount of environmental data. In the Lifewatch-WB project, a database combining segmentation in homogeneous landscape units (ecotopes), environmental attributes derived from regularly updated remote sensing data and other data sources has been designed.

Our objective was to assess the usefulness of this ecotope database for biotope and species distribution modelling.

**Peatbog modelling**
- Biological data: Natura 2000 Habitats layer
- Potential peat bog mapping: climatic, edaphic and topographic variables
- Actual peat bog mapping: addition of land cover variables

**Habitat suitability modelling for the cranberry fritillary butterfly**
- Occurrences obtained from the Lycæna working group
- Comparison of predicted suitable area (5 % omission threshold – in white) based on the ecotopes (left) and a regular grid (right): the ecotopes delineate suitable habitats more precisely while the use of a regular grid leads to the inclusion of neighbouring unsuitable areas (intensive pasture, buildings).

The cranberry fritillary butterfly (Boloria aquilonaris), indicator of peat bogs (Indval = 8.3 %).

**Comparison between biotope and habitat suitability modelling**

The use of ecotope segmentation combined with environmental data derived from remote sensing provides high quality biotope and habitat suitability models. The results of biotope and habitat suitability models were positively correlated. This suggests that biotope prediction could be used as a predictor in habitat suitability models as a proxy for other environmental variables.

”An ecotope is an ecologically homogeneous tract of land at the scale level being considered” (Zonneveld, 1989)