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Modelling groundwater-dependent vegetation patterns using ensemble learning

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Abstract. Vegetation patterns arise from the interplay between intraspecific and interspecific biotic interactions and from different abiotic constraints and interacting driving forces and distributions. In this study, we constructed an ensemble learning model that, based on spatially distributed environmental variables, could model vegetation patterns at the local scale. The study site was an alluvial floodplain with marked hydrologic gradients on which different vegetation types developed. The model was evaluated on accuracy, and could be concluded to perform well. However, model accuracy was remarkably lower for boundary areas between two distinct vegetation types. Subsequent application of the model on a spatially independent data set showed a poor performance that could be linked with the niche concept to conclude that an empirical distribution model, which has been constructed on local observations, is incapable to be applied beyond these boundaries.

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