

Many plants are wanted, but are they colonizing constructed wetlands?

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Abstract. Wetland losses over the last century have raised questions on how to stop local extinctions and restore diversity in degraded landscapes. Moreover, there is an increased awareness of how wetland plants contribute to ecosystem services and how the diversity is important for maintenance of the quality of these services. We are therefore in great need of priorities and management tools based on scientific understanding of the major ecological processes affecting the community dynamics in wetlands.

In constructed wetlands a self-design is often applied. This is based on the assumption that the plant community eventually will organize itself with appropriate species and that only morphometrical and hydrologochemical factors have to be considered. Hence, the outcome of the projects critically relies on the colonization process.

In this talk we will examine ecological theories and models for plant diversity and try to assess their implications and usefulness for practical work with wetlands. Using the species pool hypothesis and species dispersal characteristics, the species–area model, the species–biomass model combined with the core-satellite hypothesis, the competitive hierarchies model and the intermediate disturbance model, we will try to identify what they tell us about the most important mechanisms shaping colonization, extinction and co-existence in wetlands (Figure 1).

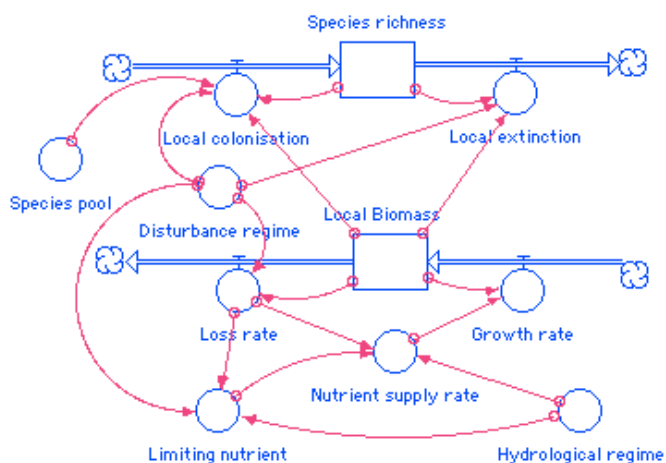


Figure 1. Stella model connecting the major drivers (circles) from ecological models used to analyze variations in biomass and species richness (squares) in wetlands. Rate parameters e.g. growth rate etc. appear as regulators. This model proposes the major mechanisms regulating community dynamics. It suggests important management opportunities, e.g. disturbance regimes, which may have an effect on both loss rates and on colonization rates and in turn affect nutrient limitation type.