

The Role of Spatial Modularity Determining Metacommunity Composition at Local Scale

Equisuany, A., *Boix, D., Cunillera-Montcusí, D., Sala, J. & Gascón, S.
(*) presenting author

INTRODUCTION

The influence of environmental filters, biotic interactions and dispersal on metacommunity assembly is a fundamental part of ecological understanding. However, the spatial distribution of habitats across landscapes can significantly alter the dynamics of these processes. We focus on habitat modularity, a disposition in which ponds have higher connectivity within the modules than between the them, and its potential to either amplify or reduce ecological forces. This research examines how the modular structure of pond networks determines the relative importance of key metacommunity drivers.

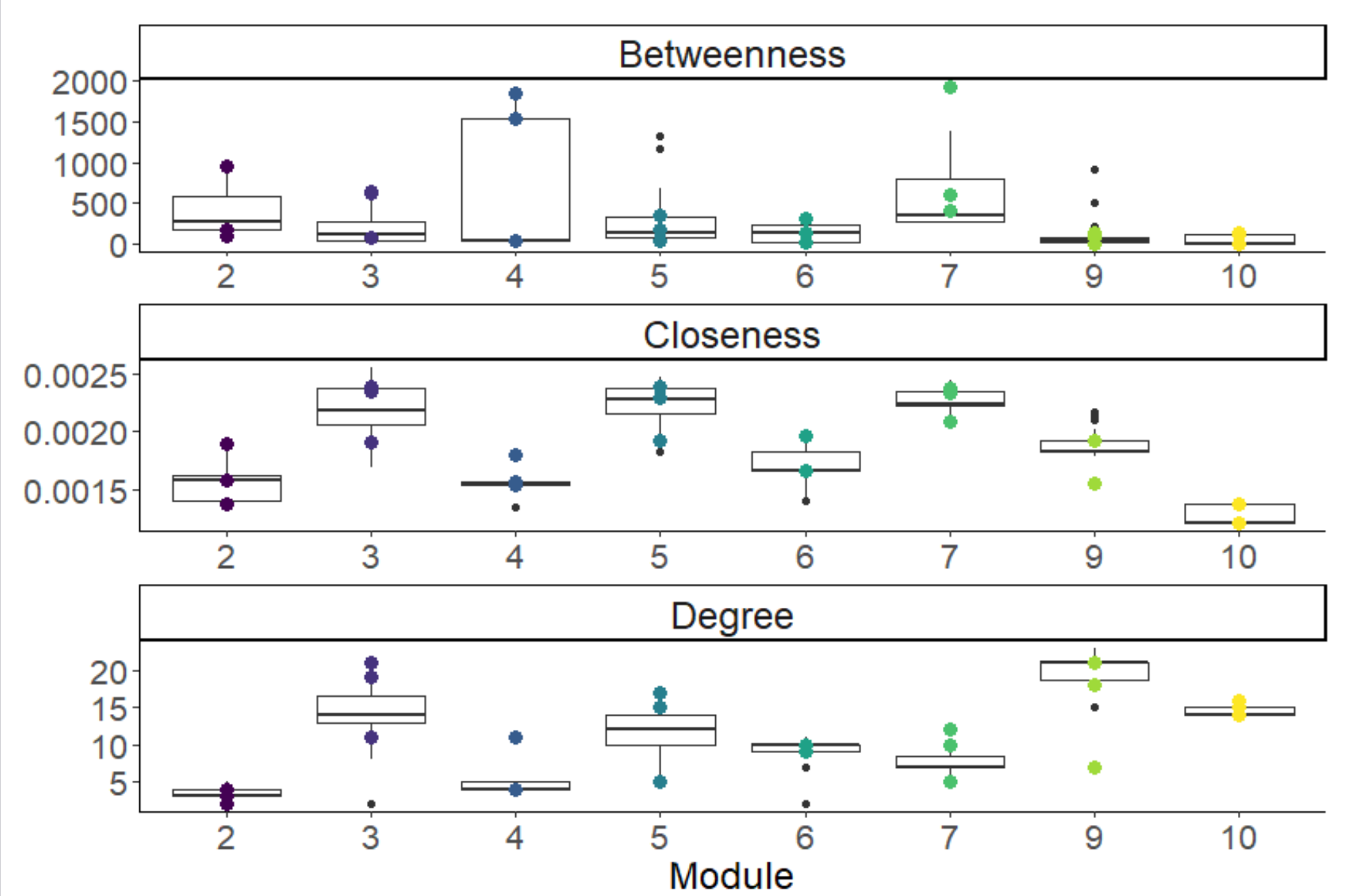
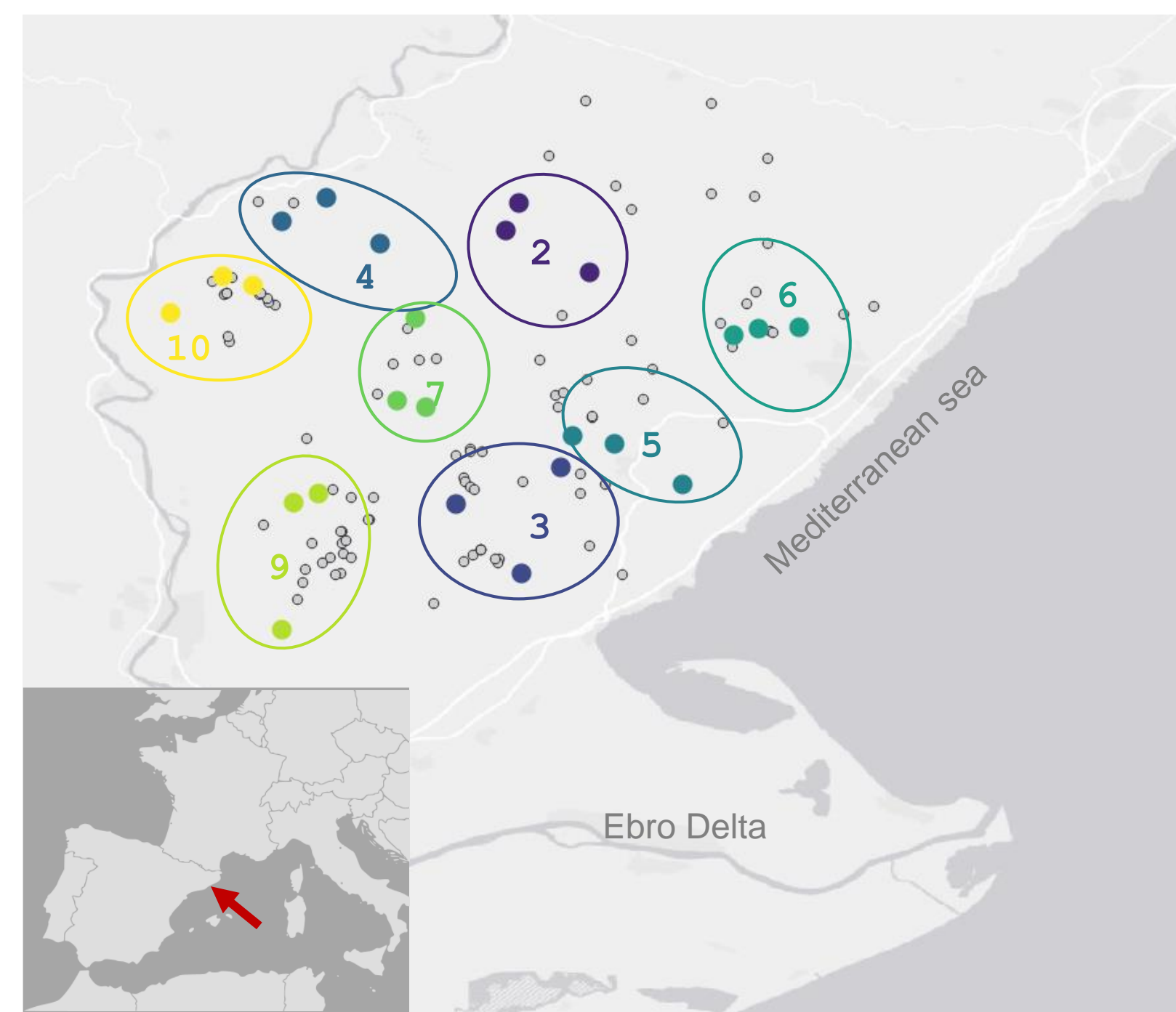
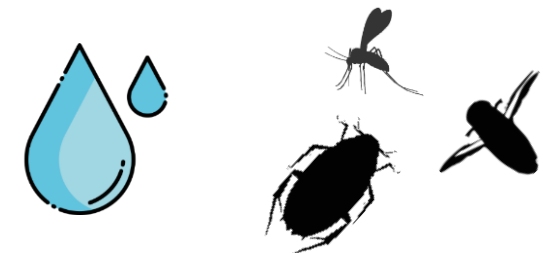
OBJECTIVES

- Assess the importance of spatial modular structure in species richness:
- Comparing the relevance of pond size, pond trophic state, pond condition and ponds distribution for species richness.
 - Evaluating if the effect is the same for active and passive dispersers.



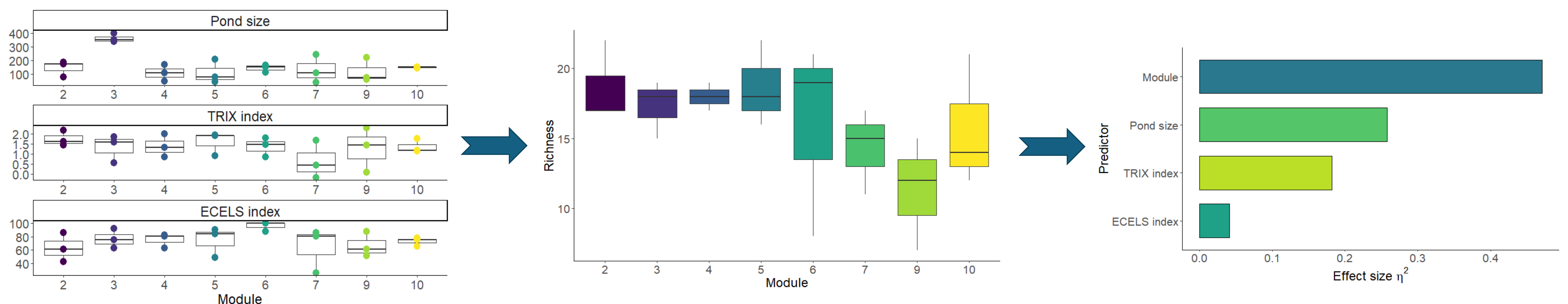
MATERIALS & METHODS

- The study site is located in El Perelló (NE Iberian Peninsula) near Ebro Delta.
- Pondscape (n° of ponds= 116) is structured in modules according to ponds connectivity metrics.
- Macroinvertebrate community and physicochemical water characteristics of 3 ponds per module were surveyed in April 2022.
- Pond condition and trophic state were measured by means of ECELS and TRIX indices, respectively.



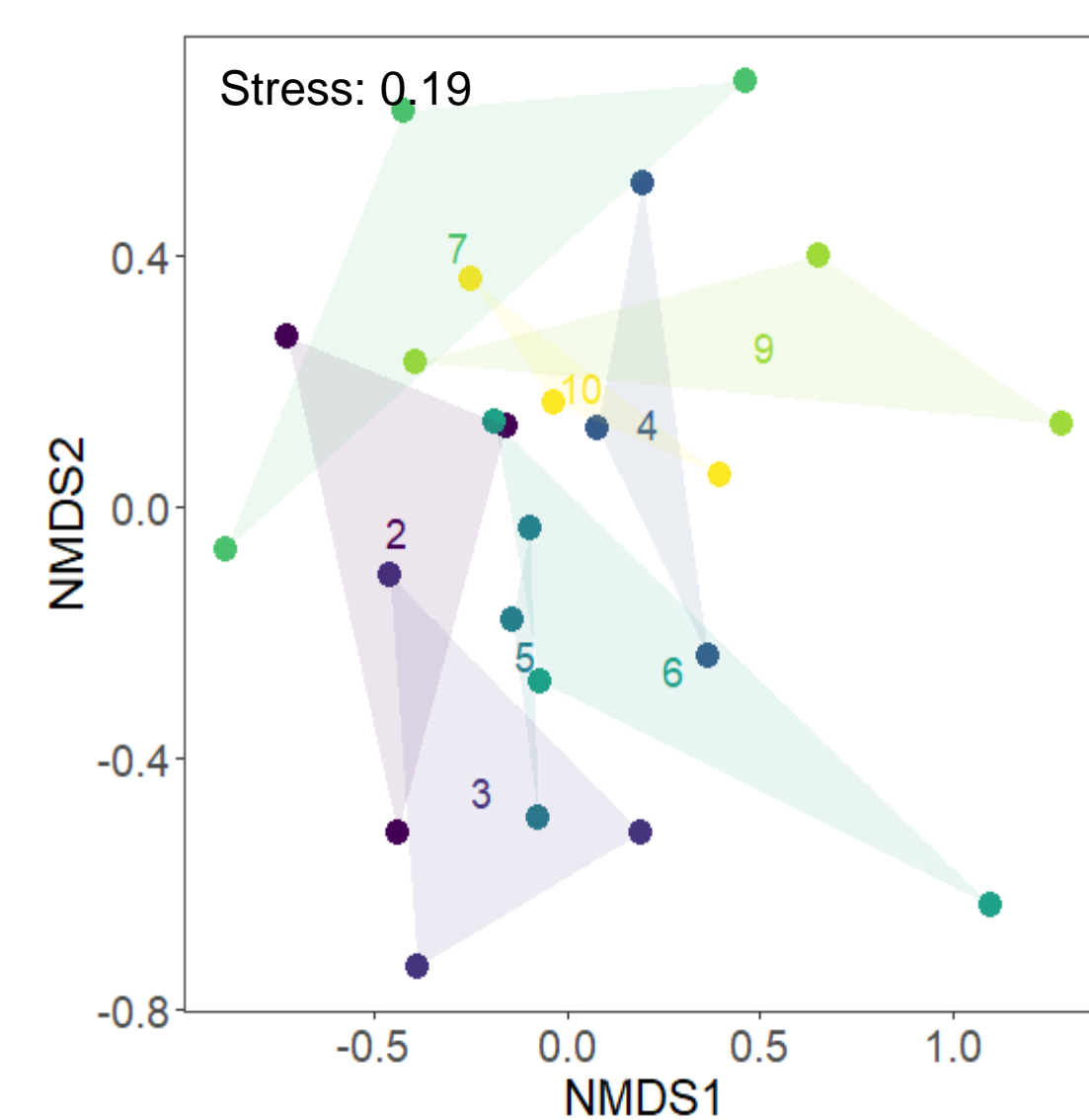
RESULTS

1. Effect of habitat quality values (ECELS and TRIX), pond size and module on species richness

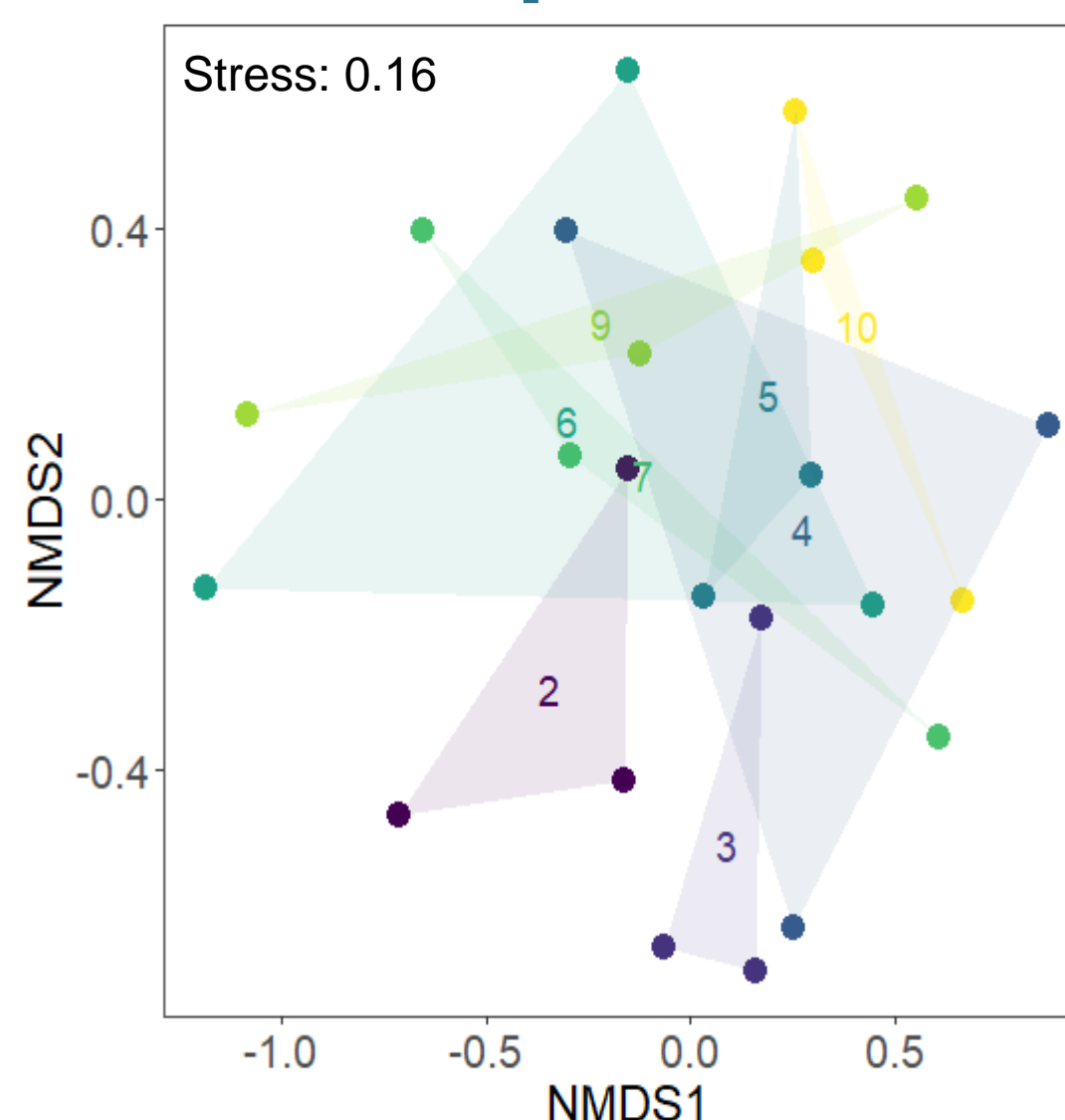


2. Species composition in modules: The effect of modules in active vs. passive dispersers

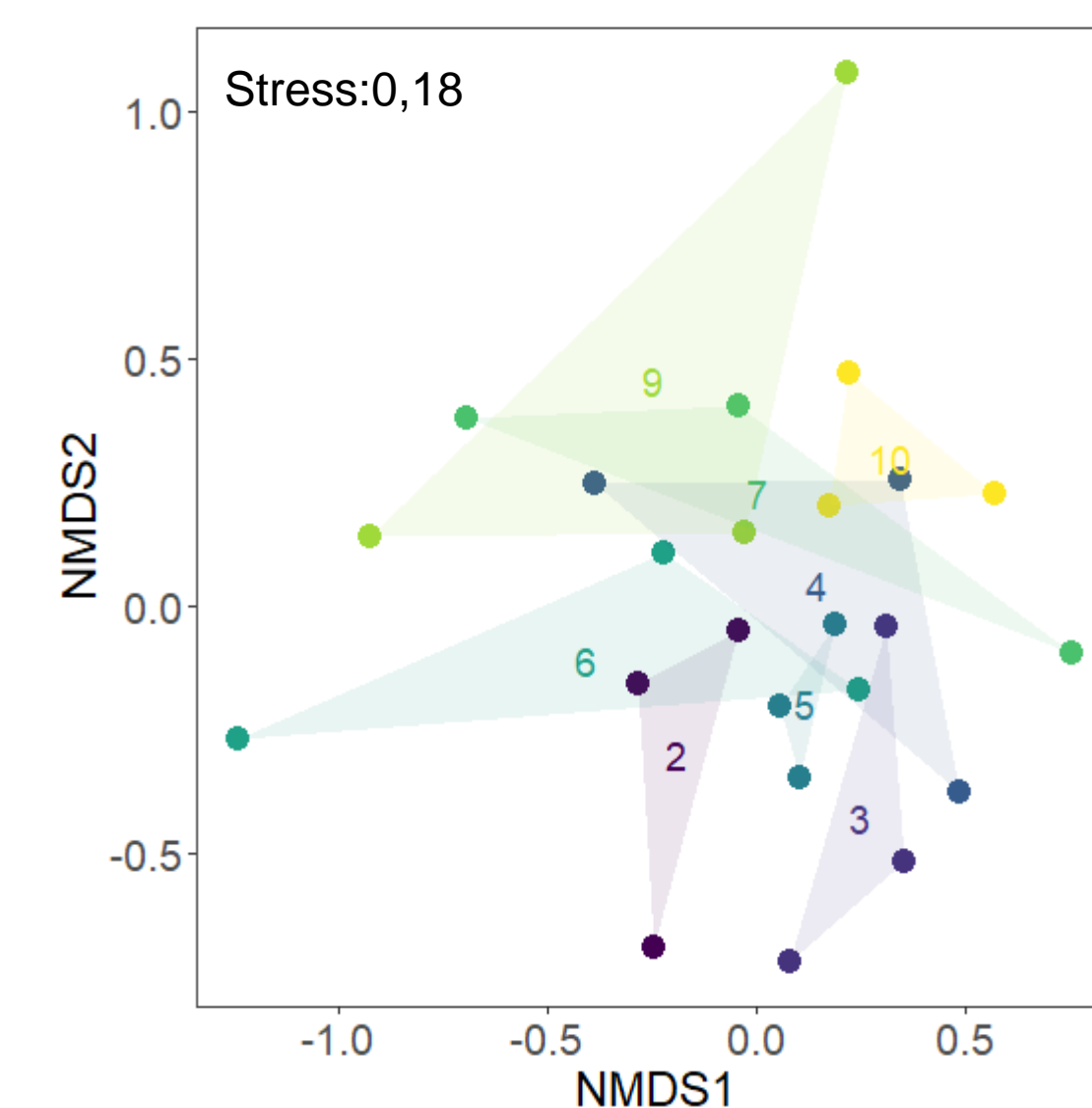
Strong active dispersers



Passive and weak active dispersers



All taxa



CONCLUSIONS

- Comparing the relevance of pond size, pond trophic state, pond condition and ponds distribution for species richness.
 - ✓ The major effect on richness was the module. Moderate effect was observed on pond size and small effect on pond condition and pond trophic state.
- Evaluating if the effect is the same for active and passive dispersers.
 - ✓ Species composition is affected by the module but passive and weak active dispersers are not more affected by the module than strong active dispersers.