Analyses & results

GCFR vs SWAFR manuscript

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1. Comparing environmental heterogeneity

Table 1: Slopes of *CLES* against ...

Variable	Slope	*P*	
Elevation	-0.029	0.135	
MAP	-0.224	0.028	*
PDQ	-0.055	0.260	
Surface_T	-0.062	0.207	
NDVI	0.059	0.134	
CEC	-0.054	0.361	
Clay	0.104	0.143	
Soil_C	-0.065	0.270	
pH	-0.013	0.729	
PC1	-0.076	0.059	.

2. Comparing species richness

Table 2: ...

metric	P_U	CLES_value
QDS_richness	0.4308535	0.5149184
HDS_richness	0.8920403	0.4947989
DS_richness	0.1678977	0.5980066
QDS_turnover_prop	0.0000000	0.7481507
HDS_turnover_prop	0.0000639	0.7740864

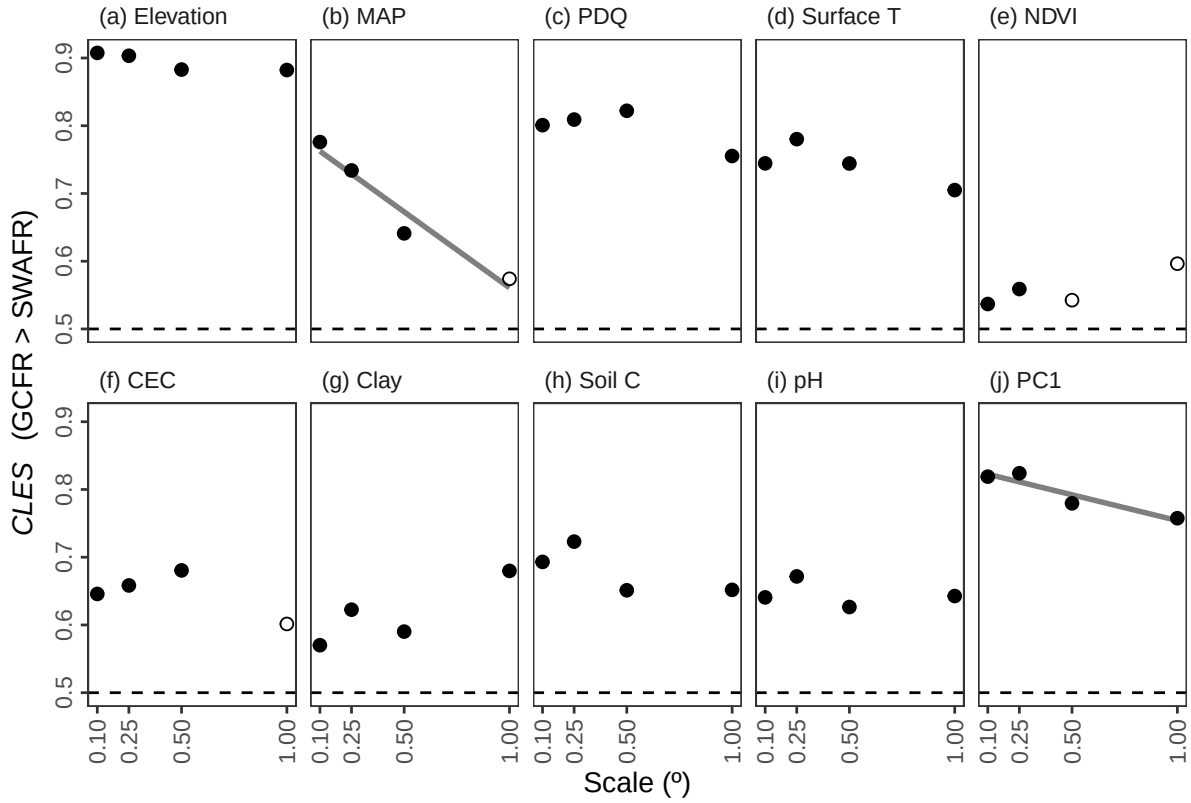

Figure 1: The common language effect size (*CLES*) of (a–i) various forms of environmental heterogeneity ($\log_{10}$-transformed) and (j) the major axis thereof (PC1) in the GCFR and SWAFR. The *CLES* here is treated as the effect of GCFR relative to SWAFR values. Filled points represent comparisons where the GCFR and SWAFR significantly differed in heterogeneity ($P = 0.05$, Mann-Whitney U-tests), while unfilled points represent those that were not significant ($P > 0.05$). Following simple linear regressions of CLES against scale, negative relationships (depicted by lines) were found for MAP (slope = -0.224, P = 0.028) and PC1 (slope = -0.076, P = 0.059). Abbreviations are as in Table 1.

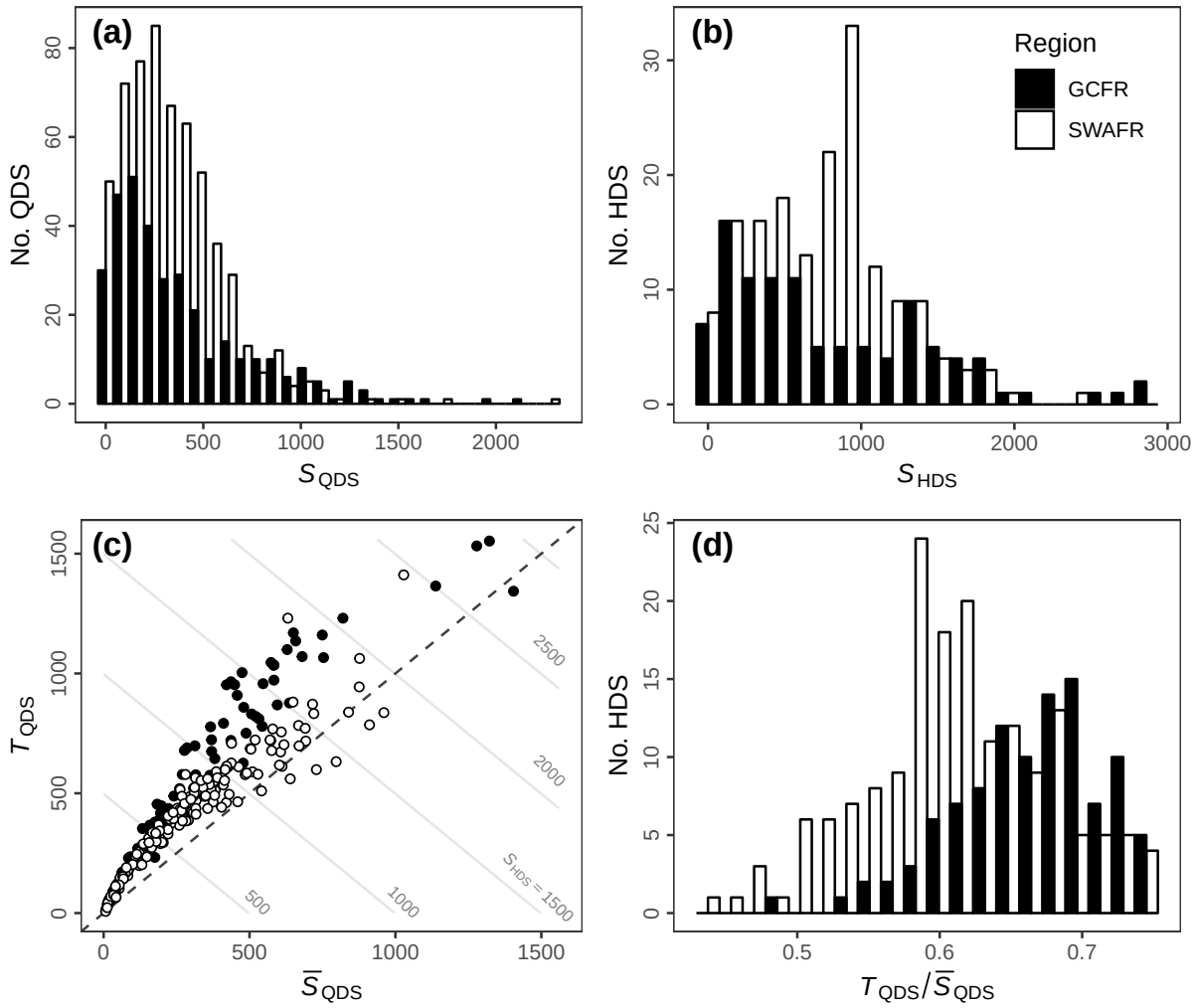

Figure 2: Distributions of (a) QDS- and (b) HDS-scale vascular plant species richness in the GCFR and SWAFR. (c) Scatter plot of mean QDS-scale richness ($\overline{S}_{\mathrm{QDS}}$) and turnover ($T_{\mathrm{QDS}}$; Equation 1) with contour lines denoting the S_{HDS} that arises as their sum. (d) The distribution of the turnover partition of S_{HDS} (T_{QDS}; in c) expressed as a proportion (T_{QDS} / $\overline{S}_{\mathrm{HDS}}$).

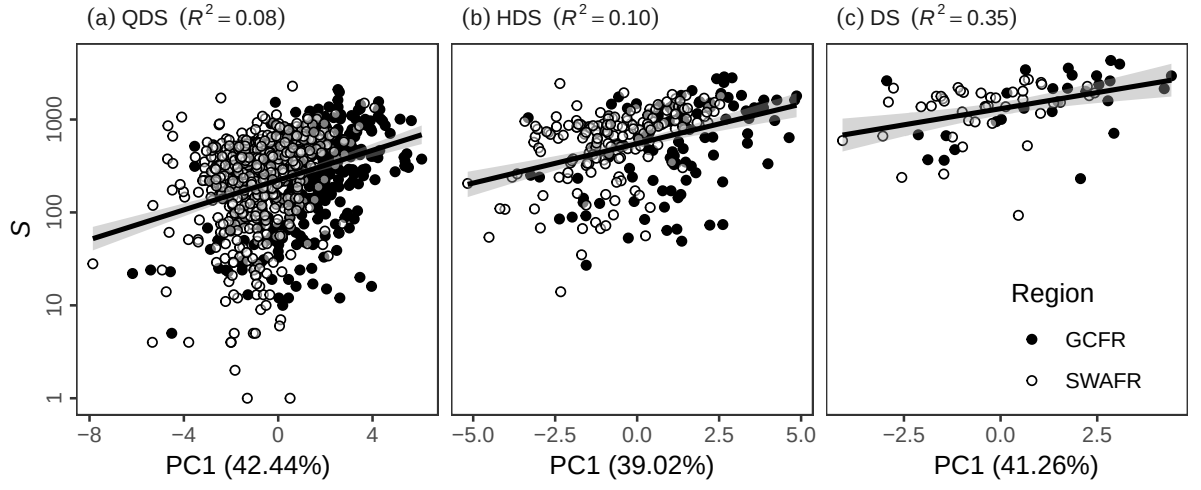

Figure 3: ...

3. Environmental heterogeneity as an explanation of species richness

3.1. Univariate models

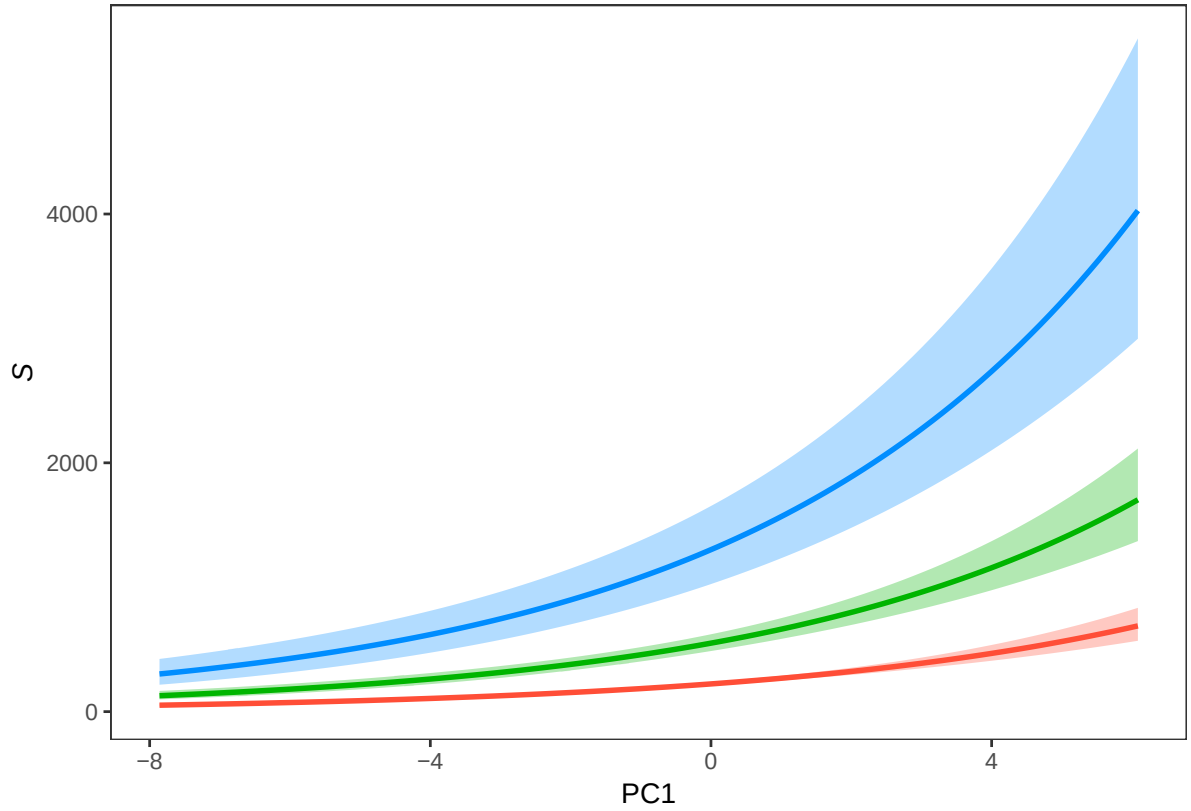

Table 3: Summarised results of the best fitting separate simple linear regressions of $\log_{10}[S_{\mathrm{QDS}}]$ against environmental heterogeneity.

Model type	Heterogeneity predictor	Slope		SWAFR effect	
Main effect * region	MAP	+	***	+	***
	Surface T	+	***	+	*
	NDVI	+	***	-	
	Soil C	+	***	+	.
	pH	+	***	+	
	PC1	+	***	+	***
Main effect + region	Elevation	+	***	+	***
	PDQ	+	***	+	***
Main effect only	CEC	+	*		
	Clay	+	***		

Table 4: Summarised results of the best fitting separate simple linear regressions of $\log_{10}[S_{\mathrm{HDS}}]$ against environmental heterogeneity.

Model type	Heterogeneity predictor	Slope	
Main effect + region	Elevation	+	***
	MAP	+	***
	PDQ	+	***
	Surface T	+	***
	PC1	+	***

Model type	Heterogeneity predictor	Slope	
Main effect only	NDVI	+	***
	CEC	-	
	Clay	+	***
	Soil C	+	***
	pH	+	*

Table 5: Summarised results of the best fitting separate simple linear regressions of $\log_{10}[S_{\mathrm{DS}}]$ against environmental heterogeneity.

Model type	Heterogeneity predictor	Slope		SWAFR effect
Main effect only	Elevation	+	*	
	MAP	+	***	
	PDQ	+	**	
	Surface T	+		
	NDVI	+	**	
	CEC	+		
	Clay	+	***	
	Soil C	+		
	pH	+		
	PC1	+	***	

3.2. Multivariate models

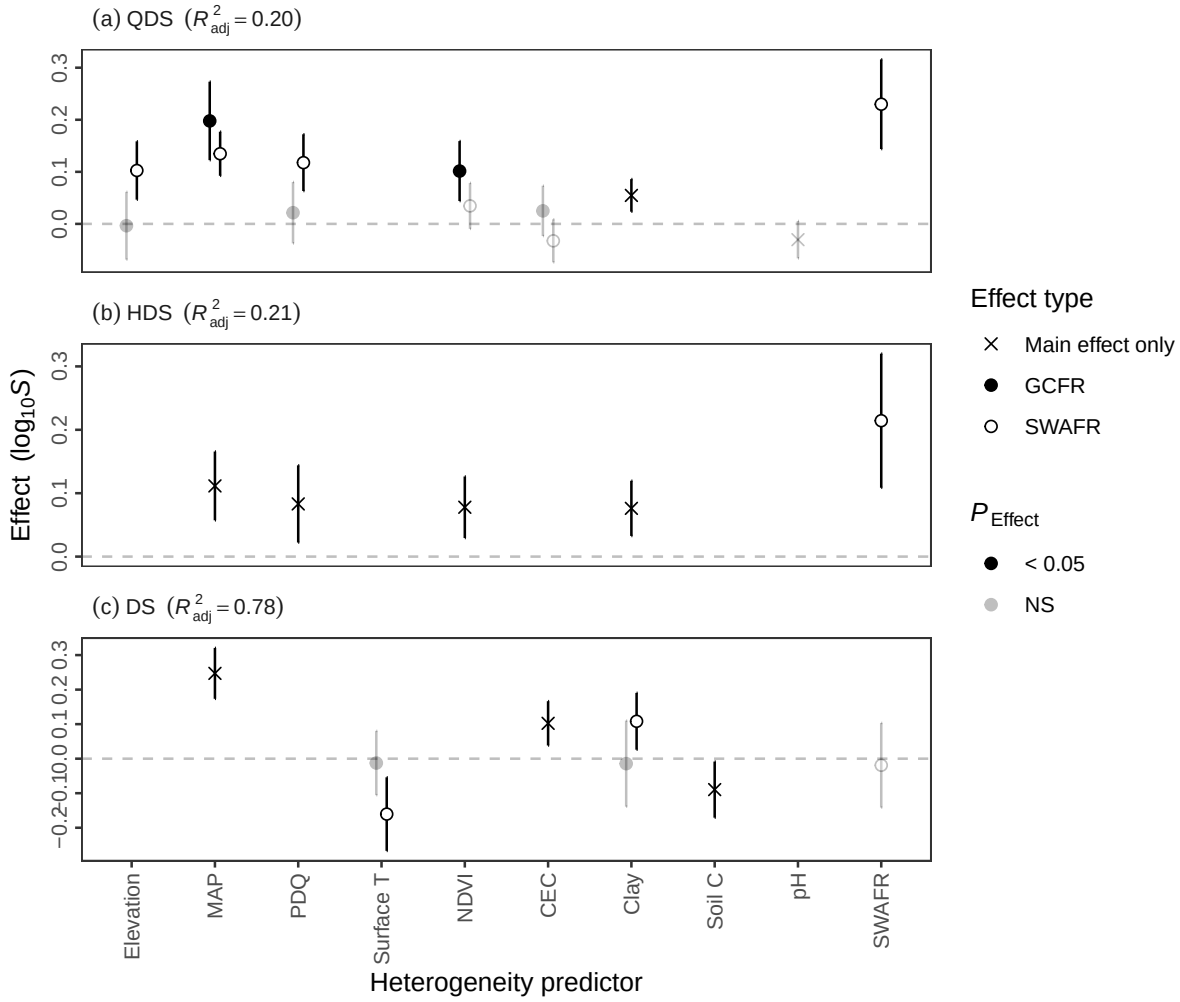
(a) QDS ($R^2_{adj} = 0.20$)
(b) HDS ($R^2_{adj} = 0.21$)
(c) DS ($R^2_{adj} = 0.78$)
Effect ($\log_{10}S$)
0.0
0.1
0.2
0.3
−0.2
−0.1
Elevation
MAP
PDQ
Surface T
NDVI
CEC
Clay
Soil C
pH
SWAFR
Heterogeneity predictor
Effect type
Main effect only
GCFR
SWAFR
P_{Effect}
< 0.05
NS

Figure 4: ...