



Supplementary Information for

**Climate drives loss of phylogenetic diversity in a grassland community**

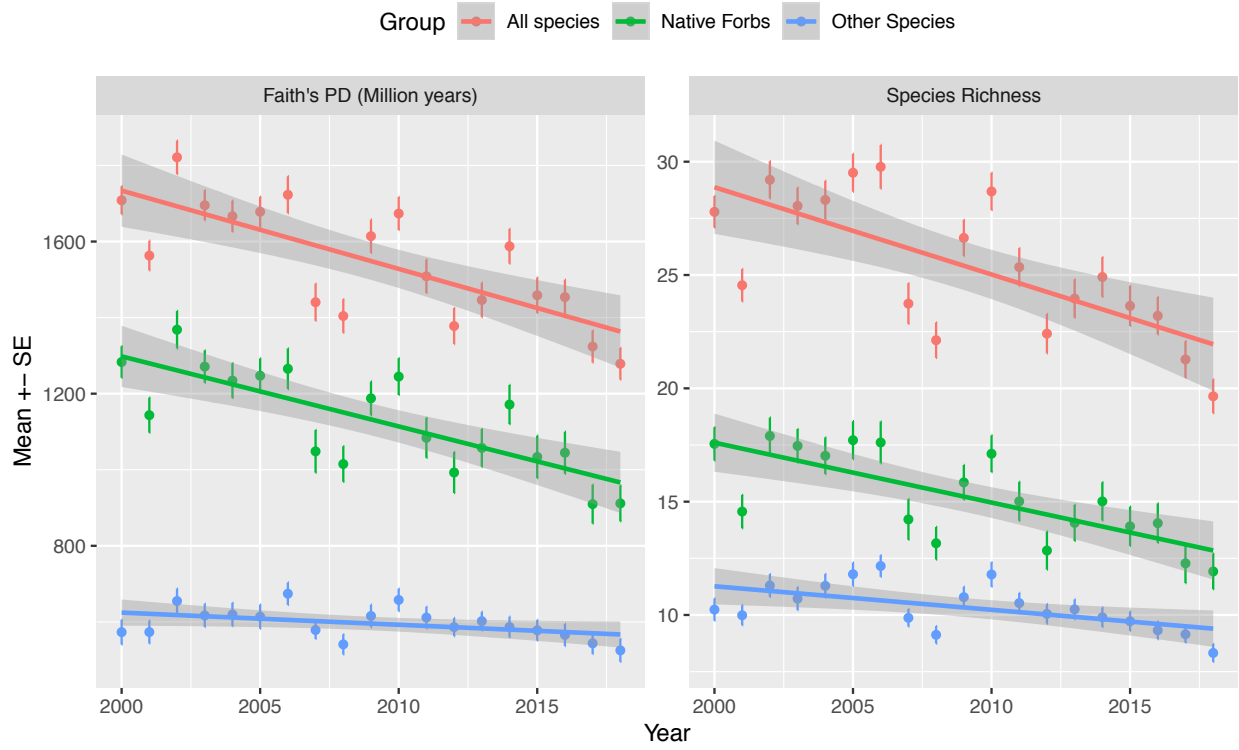
Daijiang Li\*, Jesse E. D. Miller, Susan Harrison\*

\*Corresponding author. Email: [spharrison@ucdavis.edu](mailto:spharrison@ucdavis.edu)

**This PDF file includes:**

Figure S1

Tables S1 to S4



**Fig. S1. Temporal trends in Faith's PD for different groups of species.**

**Table S1. Model results for change in different components of phylogenetic diversity over time.** Values for site level and region level are alpha diversity. Site level alpha diversity was calculated based on species from all five quadrats of each site (one value per site per year). Region level alpha diversity was calculated based on species from all 80 sites (one value per year). Values for within site and within region levels are beta diversity. Within site beta diversity was calculated as average pairwise PCDp between quadrats (one value per site per year). Within region beta diversity was calculated as average pairwise PCDp between sites (one value per year).

Level	Response	Predictors	Estimate	SE	df	t	P value	Model
Within site (among quadrats)	Average PCDp	(Intercept)	0.972	0.013	1405	72.579	<0.001	LMM
		year	-0.003	0.001	1405	-3.907	<0.001	LMM
Site level	MPD	(Intercept)	230.531	0.887	1439	259.815	<0.001	LMM
		year	-0.317	0.042	1439	-7.498	<0.001	LMM
Within region (among sites)	Average PCDp	(Intercept)	0.967	0.009	17	110.629	<0.001	LM
		year	-0.001	0.001	17	-0.676	0.508	LM
Region level	MPD	(Intercept)	232.493	0.297	17	783.854	<0.001	LM
		year	0.024	0.028	17	0.835	0.415	LM

**Table S2. Temporal trends in taxonomic diversity at different spatial scales.** Diversity values were calculated and analyzed in similar ways as Table 1. Sorensen: Sorensen dissimilarity; Nestedness: nestedness component of Sorensen dissimilarity; Turnover: turnover component of Sorensen dissimilarity.

Level	Response	Predictors	Estimate	SE	df	t	P value	Model
Within site (among quadrats)	Nestedness	(Intercept)	0.072	0.004	1439	19.712	<0.001	LMM
		year	0.002	0.000	1439	8.577	<0.001	LMM
Within site (among quadrats)	Sorensen	(Intercept)	0.423	0.010	1439	40.632	<0.001	LMM
		year	0.002	0.000	1439	4.413	<0.001	LMM
Within site (among quadrats)	Turnover	(Intercept)	0.325	0.010	1439	31.433	<0.001	LMM
		year	0.000	0.000	1439	-0.179	0.858	LMM
Site level	Richness	(Intercept)	28.875	0.752	1439	38.416	<0.001	LMM
		year	-0.395	0.028	1439	-14.223	<0.001	LMM
Within region (among sites)	Sorensen	(Intercept)	0.717	0.008	17	94.106	<0.001	LM
		year	0.001	0.001	17	1.383	0.185	LM
Region level	Richness	(Intercept)	174.411	3.640	17	47.921	<0.001	LM
		year	-0.537	0.345	17	-1.554	0.139	LM

**Table S3. Significant interaction between winter precipitation and site grazing history in affecting phylogenetic diversity (MPD).**

Predictor	Estimate	SE	t	df	P value
(Intercept)	211.64	3.750	56.44	1424	<0.001
ppt_winter_log	2.55	0.595	4.29	1438	<0.001
Ungrazed	11.39	4.945	2.30	1424	0.021
ppt_winter_log:Ungrazed	-1.66	0.784	-2.12	1438	0.034

**Table S4. Phylogenetic signal of functional traits.**

<b>traits</b>	<b>K</b>	<b>p.K</b>	<b>lambda</b>	<b>p.lambda</b>
Seed Mass	1.879	0.001	1.000	< 0.001
Height	0.233	0.010	0.868	< 0.001
Specific Leaf Area (SLA)	0.104	0.001	0.691	< 0.001
Leaf Dry Matter Content	0.093	0.001	0.752	< 0.001
Carbon : Nitrogen	0.078	0.084	0.233	< 0.001