(a)

(b)

(c)
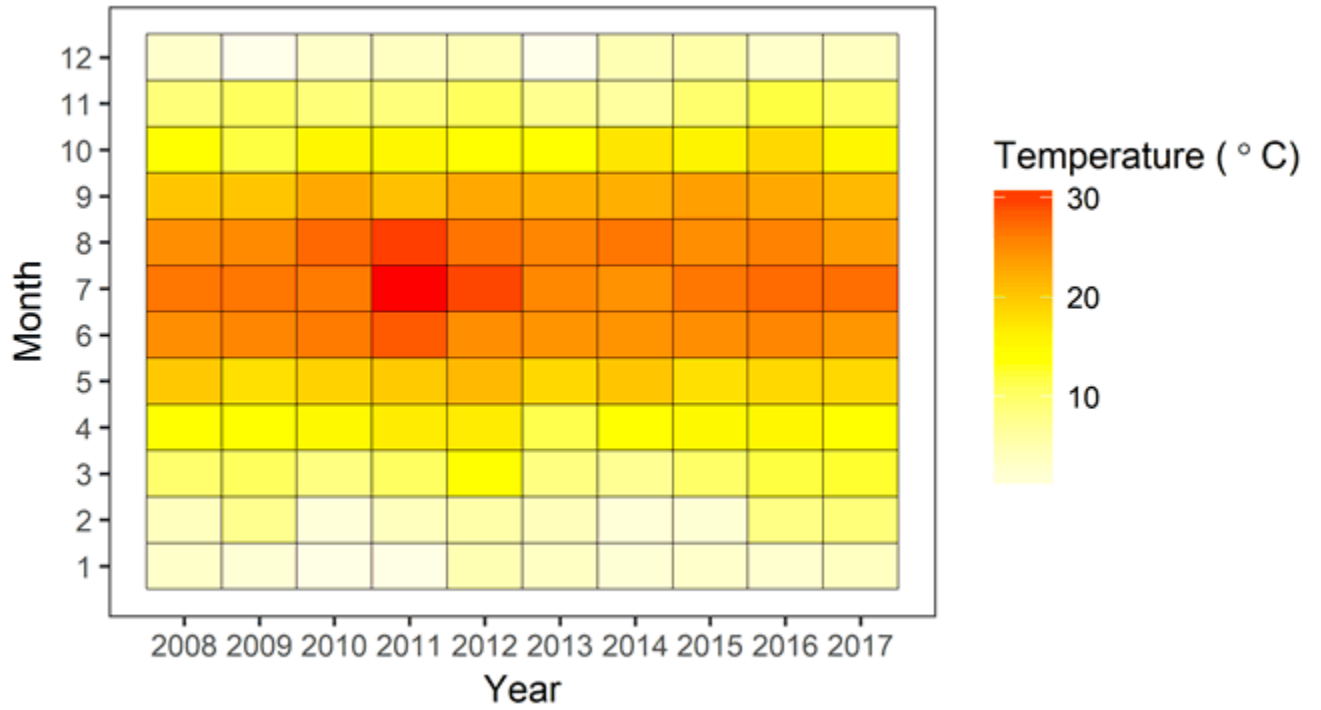

(d)
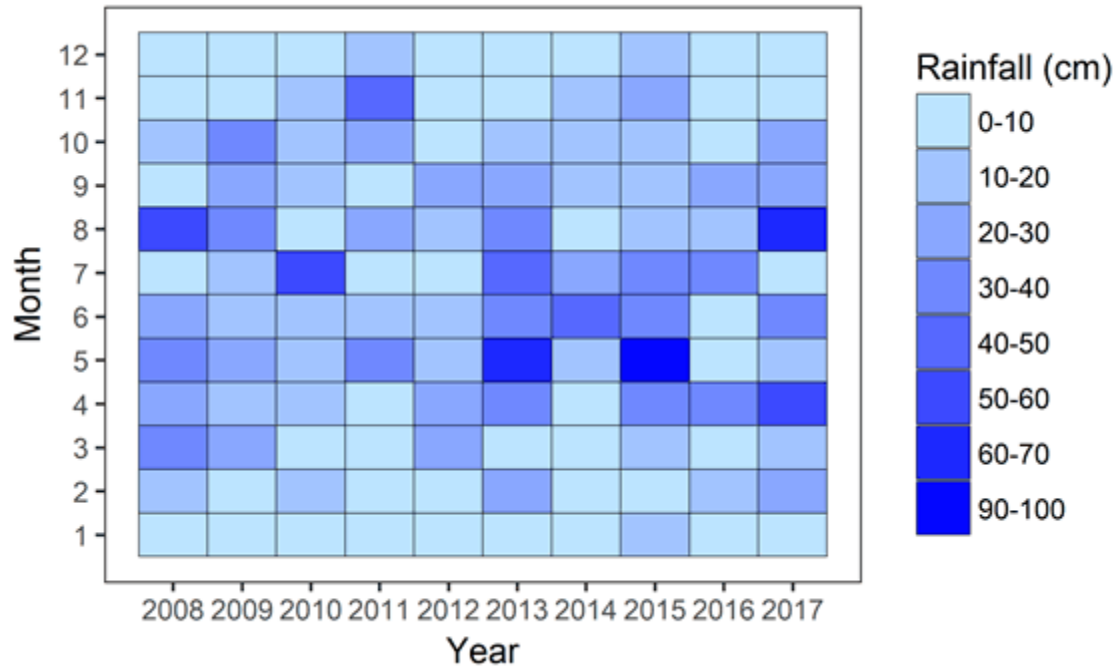
(e)   (f)

Figure S1. main plants in study area. (a) trees and shrubs (b) shrubs (c-f) grasses

(a)

(b)

Figure S2. Monthly normal temperature and rainfall values from year 2009 to 2017. (a) temperature, (b) rainfall. This figure is an excerpt from Zhou et al.[1]

Table S1. NDVI value range for different class

Class	Tree	Bush	High cover	Medium cover	Low cover	Soil	Water
Minimum	0.38	0.36	0.47	0.36	0.26	0.04	-0.61
Lower quartile	0.49	0.48	0.5	0.42	0.32	0.14	-0.36
Median	0.55	0.54	0.53	0.45	0.37	0.19	-0.24
Upper quartile	0.63	0.6	0.56	0.48	0.4	0.24	-0.13
Maximum	0.84	0.68	0.63	0.55	0.47	0.36	0.18

Table S2. PLAND and NDVI of 4 grass categories in 2010

name	Soil coverage	Low coverage	Medium coverage	High coverage	Mean NDVI
Ca	0.001198	0.338168	0.594772	0.065862	0.429918
Cb	0.016454	0.177021	0.600844	0.205681	0.452495
Ra	0.015692	0.587987	0.348657	0.047665	0.403151
Rb	0.011577	0.046749	0.46644	0.475234	0.492154

Table S3. PLAND and NDVI of 4 grass categories in 2013

name	Soil coverage	Low coverage	Medium coverage	High coverage	Mean NDVI
Ca	0.005486	0.615084	0.370394	0.009036	0.401852
Cb	0.005458	0.547956	0.445441	0.001145	0.405755
Ra	0.126464	0.689945	0.180592	0.002998	0.36545
Rb	0.027774	0.703637	0.266648	0.001941	0.385393

Table S4. PLAND and NDVI of 4 grass categories in 2015

name	Soil coverage	Low coverage	Medium coverage	High coverage	Mean NDVI
Ca	0.000942	0.049194	0.769867	0.179997	0.467769
Cb	0.013222	0.314738	0.666872	0.005168	0.422553
Ra	0.059786	0.168071	0.635599	0.136545	0.442351
Rb	0.097916	0.292197	0.5401	0.069787	0.41352

Table S5. PLAND and NDVI of 4 grass categories in 2017

name	Soil coverage	Low coverage	Medium coverage	High coverage	Mean NDVI
Ca	0.034436	0.442949	0.359356	0.163259	0.419935
Cb	0.11888	0.655068	0.21668	0.009373	0.368183
Ra	0.168277	0.535722	0.28236	0.013642	0.368248
Rb	0.239196	0.186542	0.478386	0.095876	0.387426

1.   Zhou, Y., et al., *Climate Effects on Tallgrass Prairie Responses to Continuous and Rotational Grazing.* Agronomy, 2019. **9**(5): p. 219.