

Influence of monsoon rainfall events on movement patterns of Angus crossbred vs. Raramuri Criollo cattle on desert rangeland

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Problem

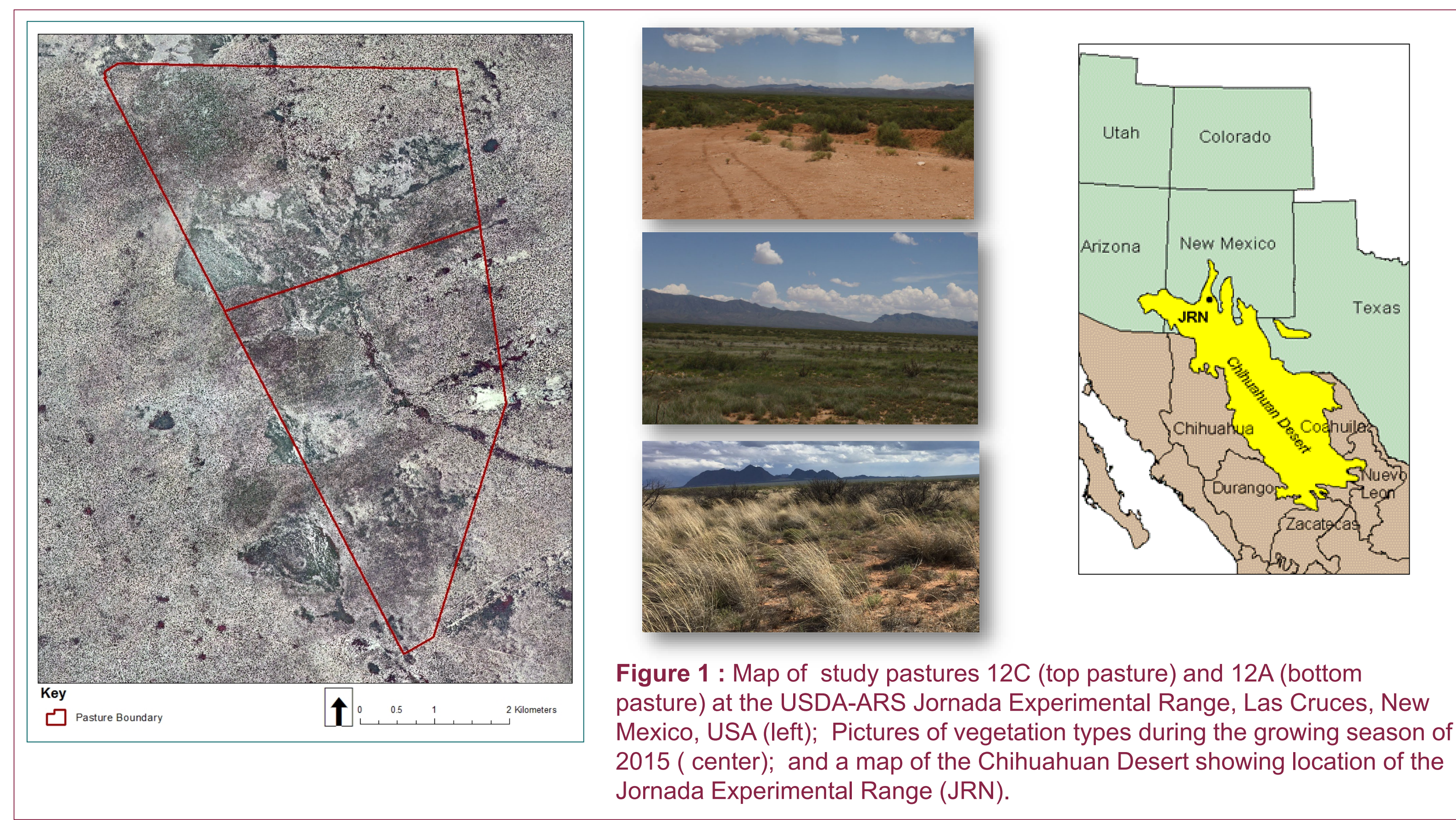
Spatial distribution of cattle in the Chihuahuan Desert is limited by weather and drinking water availability. No prior research has characterized the impact of monsoon rainfall events on spatial distribution patterns of different breeds of beef cattle.

Objective

To examine movement, activity, pasture use, and watering patterns of Angus x Hereford (AH) and Raramuri Criollo (RC) cows on days with precipitation events (PE, ≥ 1.3 mm rain recorded) vs. days with no precipitation (NP).

Methods

Eleven cows of each breed grazed separately in two large pastures (1190ha, 1165ha) at the Jornada Experimental Range in southern New Mexico during summer seasons (Aug-Sept) of 2015, 2016, and 2017 for four weeks per deployment. Seven to nine randomly selected cows per breed were collared with Lotek 3300-LR GPS set to log position every 10 min. Precipitation data were acquired from weather stations located on the northern and southern boundary of our study pastures.



Data Analysis

An average of 7.6 PE occurred during the 4-week trials each year. A weekly weighted average was calculated for each variable for days with PE vs. NP for each collared cow.

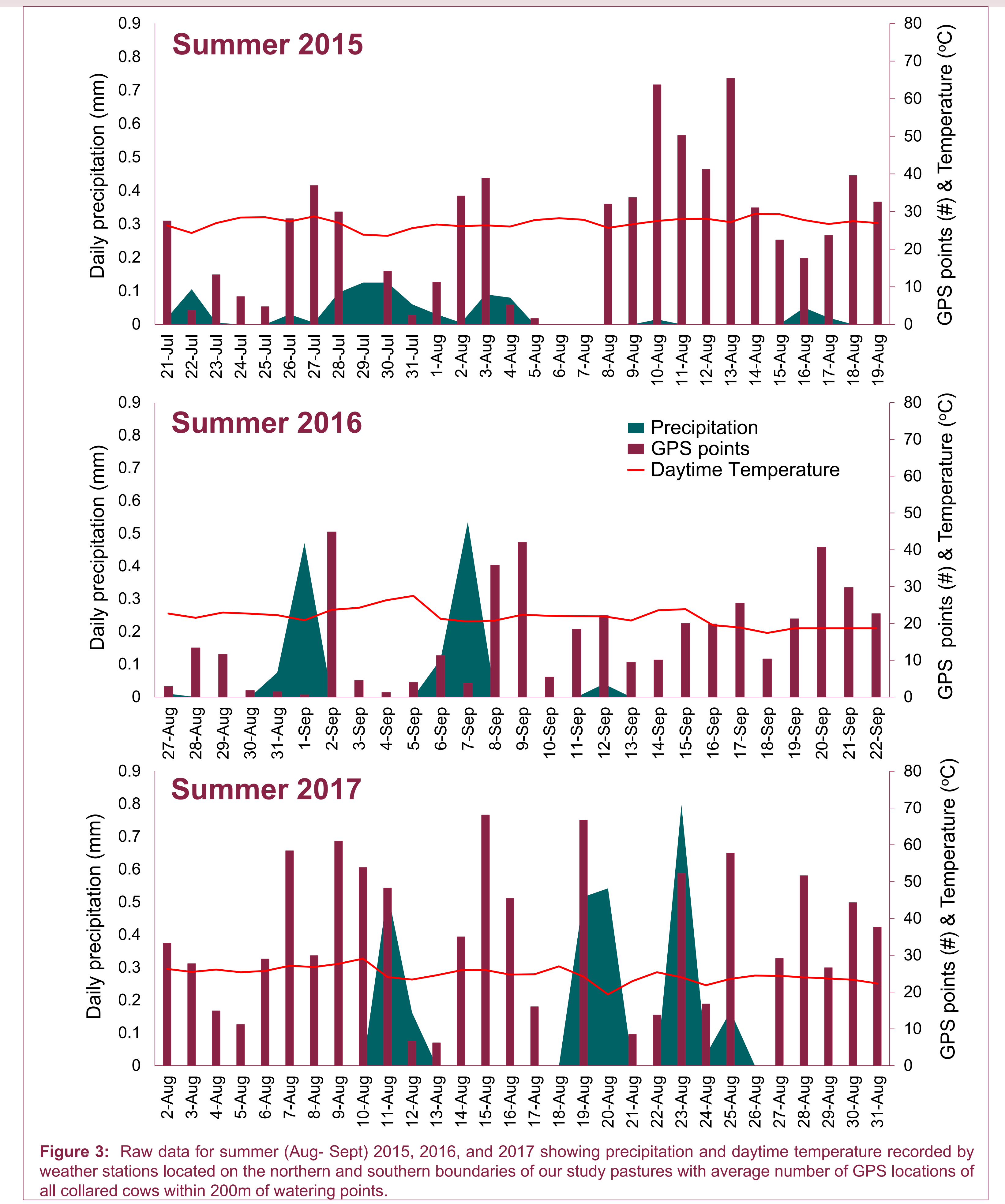


	Estimates		SE	P-Value
	PE	NP		
Precipitation (mm)	4.57	0.00	0.32	<0.01
Temperature (°C)	23.28	24.71	0.12	<0.01
Distance (km)	6.95	6.43	0.16	<0.01
Speed (m/min)	1.55(4.53)	1.50(4.32)	0.03	0.10
Time Spent Resting (h)	13.90	14.38	0.18	0.01
Time Spent Grazing (h)	9.07	8.76	0.17	0.07
Radius explored (km)	6.24(0.51)	6.21(0.5)	0.04	0.46
Dist. from Water (km)	0.83	0.80	0.03	0.41
Water 200m (h)	2.09(1.32)	2.88(2.95)	0.16	<0.01
Water 100m (h)	1.58(0.78)	2.45(1.89)	0.17	<0.01

Table 1: Movement, activity, pasture use, and watering patterns of Angus Hereford crossbred and Raramuri Criollo cows while grazing Chihuahuan Desert rangeland in southern New Mexico during the growing (summer) season on days with precipitation event (PE) vs. days with no precipitation (NP). Variables with values in parenthesis were expressed as natural logarithm transformation in analysis and back-transformed median estimates given in parenthesis.

Results

On PE days, cows traveled farther, moved at similar velocities, spent more time grazing and less time resting, explored similar areas, and traveled on average similar distances from watering points compared to NP days. On PE days cows spent detectably less time within 200m and 100m of drinkers regardless of breed. We found no rainfall-by-breed interaction. Overall, RC cows traveled farther, at higher velocities, spent more time grazing and less time resting, and explored areas with greater radius than AH counterparts.



Preliminary Conclusions

Monsoon precipitation events appeared to relax environmental constraints on movement and activity of cows of both breeds likely due to the availability of ephemeral watering sources and a transient drop in ambient temperature.



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