

Figure 1: Rangelands in US
[Reference Link](#)

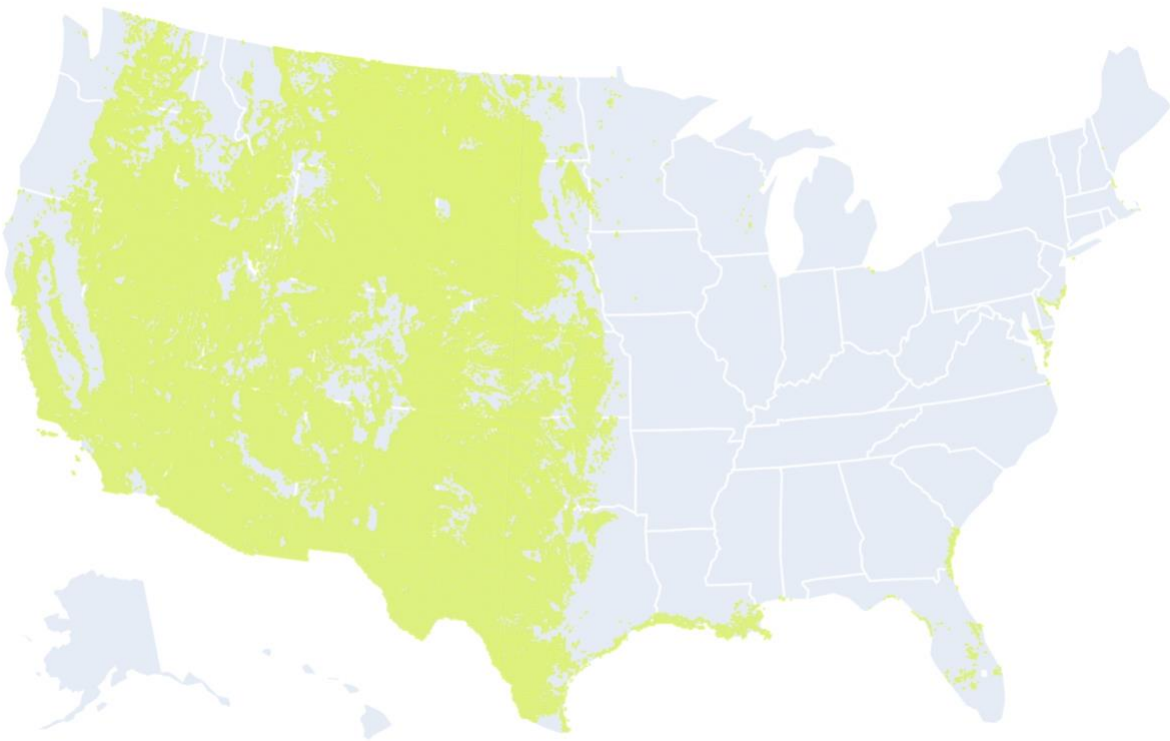


Figure 2: Grids being used

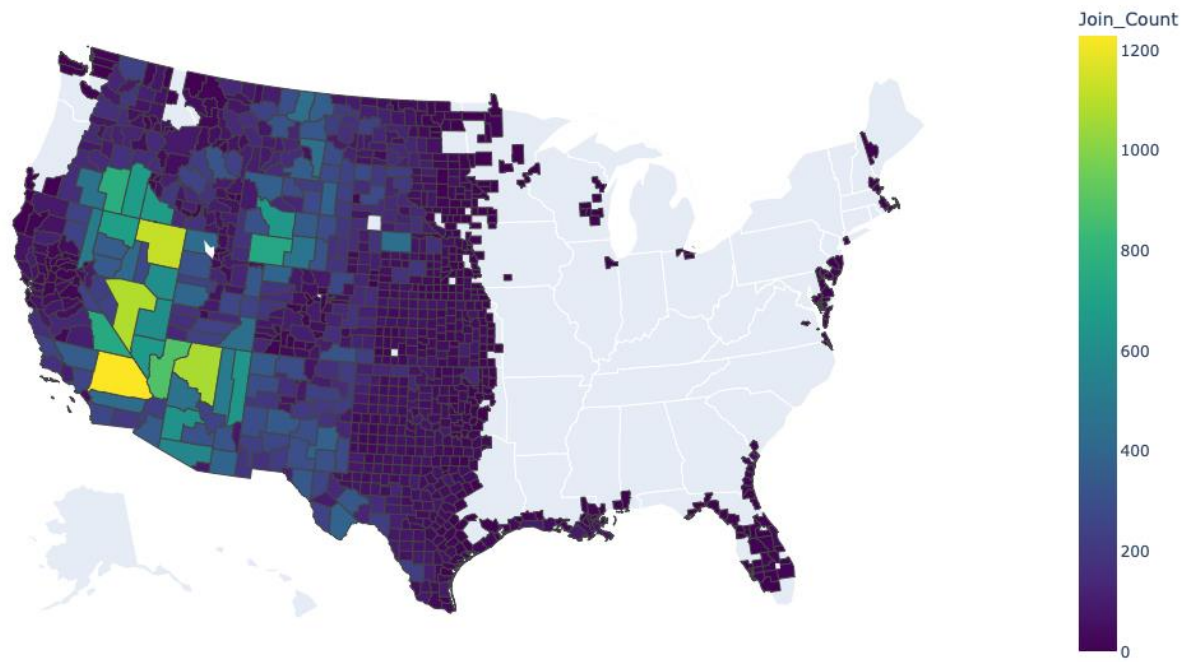


Figure 3: Counties are colored by the # of rangeland grids.

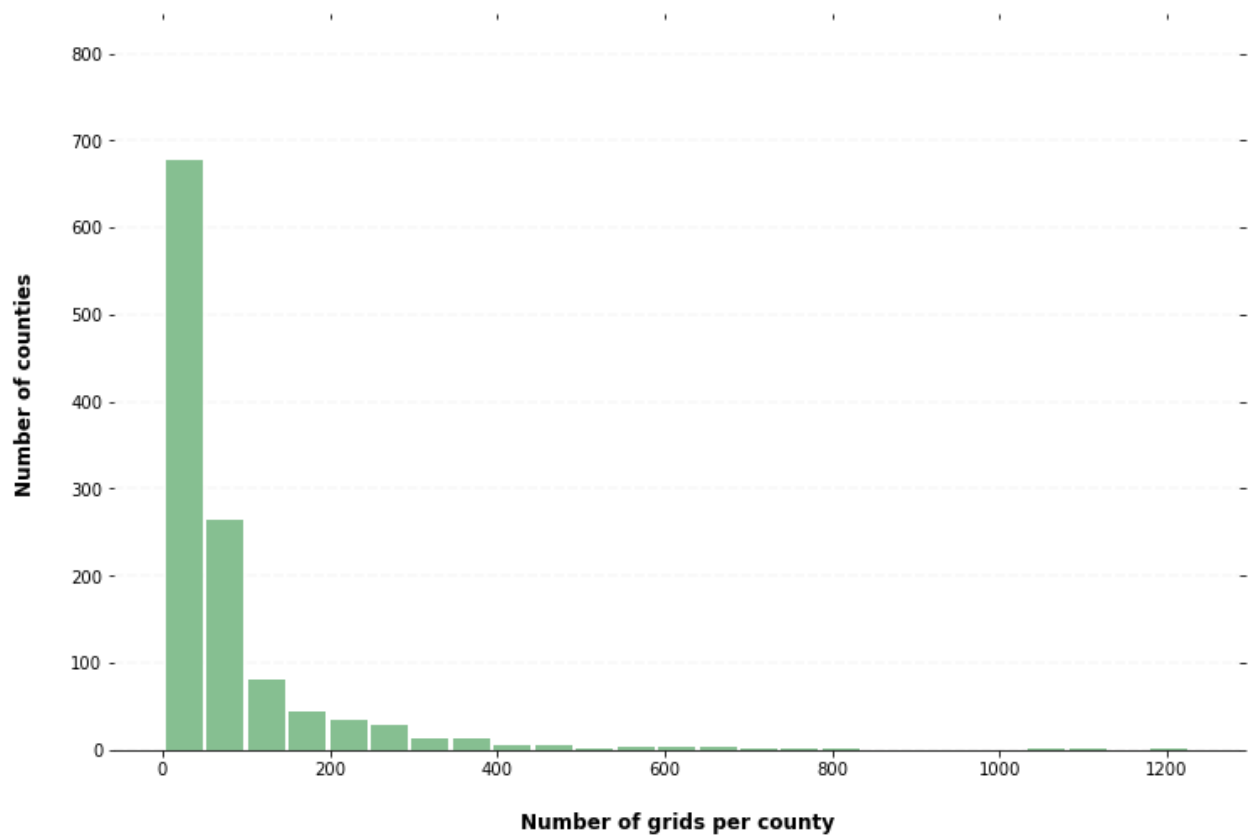


Figure 4: Distribution of rangeland grids per county

Statistics

1. There are a total of 3006 counties in the US, the counties that cover more than 1 pixel of rangeland are 2644.
2. For our analysis, we are considering a total of 1052 county-state combinations where grids are selected such that rangelands cover at least 20% area of the grid.
3. This covers 90,025 grids out of the 483897 total grids.

ACTION ITEMS:

1. **County selection**—min area as cut-off, produce counties along with area being covered by rangelands.
2. **Grids selection**- filter on grid area being covered by rangelands. Zoom in on 0-50 grids per county.

Thermal Stress Calculation

Heat Stress

Projected daily values for average daily temperature (T_{air} in degrees Celsius) and relative humidity (RH) were used to calculate THI as:

$$\text{THI} = 0.8 \times T_{\text{air}} + \text{RH} \times (T_{\text{air}} - 14.4) + 46.4$$

following Hahn et al. (1995) and Brown-Brandl et al. (2006). Note that the daily climatological data included only VPD and minimum and maximum temperature (T_{min} , T_{max}). Average daily air temperature was computed as:

$$T_{\text{air}} = (T_{\text{min}} + T_{\text{max}}) / 2$$

Categorization in Zones

Normal <75	Alert 75-78	Danger 79-83	Emergency >84
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[Reference Link](#)

A per-grid view (1979-2019)

Date	PPT	TMAX	TMIN	TMID	RMAX	RMIN	RMID	LAT	LON	THI	Emeraencv	Danger	Alert	Normal
January 1979	139.375	22.781	9.988...	16.3847	92.7287	41.6684	67.19...	26...	-8...	60.9645	0	0	0	31
February 1979	14.75	24.0271	9.73	16.8786	93.3421	38.4064	65.87...	26...	-8...	61.7433	0	0	0	28
March 1979	50.625	26.2832	12.25...	19.2668	100	42.3948	71.19...	26...	-8...	65.318	0	0	0	31
April 1979	45.775	30.2087	16.47...	23.3437	98.989	40.043	69.516	26...	-8...	71.3094	0	0	1	29
May 1979	201.125	30.84	18.58...	24.7137	99.9955	48.6823	74.33...	26...	-8...	73.8713	0	0	12	19
June 1979	118.275	33.2173	20.74...	26.9805	100	45.999	72.99...	26...	-8...	77.1575	0	3	23	4
July 1979	120.65	34.3077	22.13...	28.2195	100	47.851	73.92...	26...	-8...	79.1897	0	18	13	0
August 1979	196.45	33.4758	21.81...	27.6477	100	48.5152	74.25...	26...	-8...	78.3546	0	6	25	0
September 1979	358.3	31.6267	22.773	27.1998	100	59.3183	79.65...	26...	-8...	78.3444	0	11	18	1
October 1979	43.45	30.0465	18.92...	24.4856	99.7748	49.6023	74.68...	26...	-8...	73.5361	0	0	9	22
November 1979	51.575	26.8793	16.464	21.6717	99.376	52.4433	75.90...	26...	-8...	69.3449	0	0	2	28
December 1979	74.625	24.0074	13.16...	18.5884	92.1768	46.849	69.51...	26...	-8...	64.3029	0	0	0	31
January 1980	98.925	24.0584	10.68...	17.3711	100	48.2845	74.14...	26...	-8...	62.5857	0	0	0	31
February 1980	46.8	22.5224	8.432...	15.4772	93.1872	38.5924	65.88...	26...	-8...	59.6715	0	0	0	29
March 1980	62.225	28.1148	15.08...	21.6003	89.8323	39.66	64.74...	26...	-8...	68.4309	0	0	1	30
April 1980	113.075	28.699	15.78...	22.2408	98.6737	41.179	69.92...	26...	-8...	69.7006	0	0	0	30
May 1980	100.275	31.5635	18.45...	25.0106	100	46.0313	73.01...	26...	-8...	74.1802	0	0	14	17
June 1980	88.4	33.6413	20.794	27.2177	100	45.2933	72.64...	26...	-8...	77.4785	0	7	18	5
July 1980	183.45	34.0713	21.97...	28.0231	100	50.9277	75.46...	26...	-8...	79.0871	0	16	15	0
August 1980	173.775	33.6868	22.14...	27.9152	100	49.7594	74.87...	26...	-8...	78.8467	0	13	18	0
September 1980	126.9	32.7317	21.49...	27.115	100	54.839	77.41...	26...	-8...	77.9356	0	4	26	0
October 1980	33.25	31.2632	18.68...	24.9747	99.6887	44.8471	72.26...	26...	-8...	74.0598	0	0	14	17

ACTION ITEMS: Calculate mean, max, std dev, 90th percentile for the THI variable.