
Article:
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Table 1 Methods used for baseline climate interpolation, taking January as an example. P, P_{pday}, CV_{pday}, T and T_{range} represent monthly total precipitation (mm), mean precipitation per precipitation day (mm), coefficient of variation of precipitation per precipitation day (unitless), monthly temperature (℃) and monthly temperature range (℃) respectively. The coefficient of determination (R^2) and statistical significance (p) are given for the regression equations, in which H represents elevation (m) while E and N represent six-digit easting and northing grid references (unitless) in the UK National Grid respectively. n indicates the number of MIDAS stations used. IDW is the abbreviation of Inverse Distance Weighted interpolation method.

Variables	Method	R^2	p	n
P	P = 286 + 0.21 H – 0.00058 E	0.70	< 0.001	27
P_{pday}	P_{pday} = 24.1 + 0.0069 H – 0.000026 E – 0.000019 N	0.75	< 0.001	27
CV_{pday}	IDW	-	-	27
T	T = 3.78 – 0.0064 H	0.88	0.001	8
T_{range}	T_{range} = -6.79 – 0.0032 H + 0.000034 E	0.87	0.006	8

Table 2 Validation of baseline climate variable interpolation based on the ratio of root mean square error (RMSE) to the average value of the climate variable at validation stations (Average), and R^2. The abbreviations for climate variables are the same as those in Table 1. n is the size of the sample for RMSE and R^2 calculation, and equals the number of stations employed for the validation * 12 (i.e. Jan - Dec).

Variables	RMSE	Average	RMSE / Average	R^2	p	n
P	17.59	98.71	0.18	0.83	< 0.001	60
P_{pday}	0.76	5.05	0.15	0.78	< 0.001	60
CV_{pday}	0.13	1.37	0.10	0.46	< 0.001	60
T	0.27	5.63	0.05	0.98	< 0.001	48
T_{range}	0.54	5.88	0.09	0.92	< 0.001	48

Table 3 Environmental scenarios employed in this study. As shown in 'Name' column, the scenarios are a combination of climate scenarios (i.e. baseline (1961-1990), 2020s (2010-2039), 2050s (2040-2069), and 2080s (2070-2099)) and management scenarios (i.e. BAU (Business_As_Usual, Figure 1d), Carbon (Carbon storage) and Food (Food security)). The configuration of management scenarios is given in the rightmost three columns. X represents drainage density in the BAU scenario and 2X represents two times X. Area Changes in the area drained or burned were not modeled in these scenarios. In the food security scenario, areas with light grazing in the BAU were overgrazed.

Scenario category	Name	Drainage Density (km km^{-2})	Grazing level	Burning frequency (years)
Base	Baseline_BAU	X	Light grazing, Overgrazing	10
Climate change	2020s_BAU	X	Light grazing, Overgrazing	10
	2050s_BAU	X	Light grazing, Overgrazing	10
	2080s_BAU	X	Light grazing, Overgrazing	10
Land Management Interactions	Baseline_Carbon	No drainage	No grazing	No burning
	Baseline_Food	2X	Overgrazing	5
	2020s_Carbon	No drainage	No grazing	No burning
	2020s_Food	2X	Overgrazing	5
	2050s_Carbon	No drainage	No grazing	No burning
	2050s_Food	2X	Overgrazing	5
	2080s_Carbon	No drainage	No grazing	No burning
	2080s_Food	2X	Overgrazing	5

Table 4 Percentage (%) of blanket peat-covered areas in the North Pennines predicted to have a different erosion rate (t ha^{-1} yr^{-1}) under environmental scenarios including (a) Business-As-Usual scenarios (BAU), (b) carbon storage scenarios (Carbon), (c) food security scenarios (Food).

a

Erosion category (t ha^{-1} yr^{-1})	Baseline _BAU	2020s _BAU	2050s _BAU	2080s _BAU
<1.5	6.86	5.44	5.19	5.16
1.5-2	21.20	27.16	18.62	18.44
2-2.5	48.88	50.80	50.74	48.06
2.5-3	16.36	10.03	18.62	21.45
>3	6.70	6.56	6.83	6.89

b

Erosion category (t ha^{-1} yr^{-1})	Baseline _Carbon	2020s _Carbon	2050s _Carbon	2080s _Carbon
<1.5	98.95	98.95	98.95	98.94
1.5-2	0.02	0.01	0.01	0.03
2-2.5	0.04	0.05	0.04	0.04
2.5-3	0.01	0.01	0.01	0.02
>3	0.98	0.98	0.98	0.98

c

Erosion category (t ha^{-1} yr^{-1})	Baseline _Food	2020s _Food	2050s _Food	2080s _Food
<1.5	4.83	4.60	4.57	4.57
1.5-2	1.13	0.43	0.31	0.29
2-2.5	2.03	1.01	0.83	0.78
2.5-3	18.36	26.60	18.77	18.94
>3	73.64	67.35	75.52	75.42

Table 5 Percentage (%) of blanket peat-covered areas in the North Pennines with different levels of mean annual potential wildfire severity (PFS) under environmental scenarios including (a) Business-As-Usual scenarios (BAU), (b) carbon storage scenarios (Carbon), (c) food security scenarios (Food). A zero value indicates the percentage of the area is less than 0.005%.

a

PFS category	Baseline _BAU	2020s _BAU	2050s _BAU	2080s _BAU
<0.3	47.84	26.70	17.40	11.49
0.3-0.5	47.60	68.74	78.03	83.93
>0.5	4.56	4.56	4.56	4.58

b

PFS category	Baseline _Carbon	2020s _Carbon	2050s _Carbon	2080s _Carbon
<0.3	0.98	0.98	0.98	0.98
0.3-0.5	0	0	0	0
>0.5	99.02	99.02	99.02	99.02

c

PFS category	Baseline _Food	2020s _Food	2050s _Food	2080s _Food
<0.3	95.44	95.44	95.44	95.44
0.3-0.5	0	0	0	0
>0.5	4.56	4.56	4.56	4.56