Supplementary material for

Comparing the performance of daily forest fire danger summary metrics for estimating fire activity in southern Australian forests

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The gradients and intercepts of Theil-Sen regression curves applied to ranked percentile curves for all combinations of metrics, study areas and fire activity classifications are provided in Tables S1 to S9.

Table S1. Summary of Theil-Sen regression gradients for the FFDI metrics in the six study areas during the fire day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	0.068	0.112	0.192	0.083	0.419	**0.155**	**0.134**
M_e	0.071	0.110	**0.187**	**0.074**	0.419	0.175	0.142
M_t	**0.066**	0.111	0.204	0.094	0.551	0.190	0.151
M_l	0.069	0.111	0.202	0.091	0.538	0.198	0.155
M_m	0.085	0.117	0.245	0.088	0.548	0.211	0.164
M_a	0.071	0.111	0.217	0.085	0.471	0.186	0.149
M_d	0.068	0.120	0.244	0.100	0.440	0.193	0.156
S_h	0.068	**0.107**	0.200	0.082	0.438	0.162	0.135
S_b	0.069	0.108	0.200	0.083	0.444	0.164	0.136
S_a	0.069	0.111	0.201	0.081	0.476	0.178	0.144
$S_d{}^C$	0.068	0.108	0.198	0.083	**0.392**	0.166	0.137
S_n	0.075	0.118	0.236	0.113	0.670	0.282	0.177

Table S2. Summary of Theil-Sen regression intercepts for the FFDI metrics in the six study areas during the fire day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	50.42	38.18	59.61	55.57	66.14	**55.56**	**55.57**
M_e	49.40	38.69	**60.04**	**58.76**	66.85	52.10	55.43
M_t	**51.96**	38.38	57.12	51.51	55.69	44.53	51.74
M_l	50.66	38.43	57.39	52.57	56.53	43.84	51.61
M_m	40.85	37.16	49.82	52.51	57.04	39.41	45.33
M_a	47.93	39.17	56.17	54.07	62.83	47.97	51.02
M_d	49.92	33.43	51.01	47.74	66.38	44.43	48.83
S_h	51.07	39.07	58.69	56.15	66.45	52.31	54.23
S_b	50.81	**39.31**	57.89	55.74	64.70	52.53	54.13
S_a	50.55	38.54	57.06	56.26	61.62	48.73	53.40
$S_d{}^C$	51.00	39.07	58.38	55.55	**67.66**	53.35	54.45
S_n	46.20	33.40	53.79	39.89	42.32	21.56	41.10

Table S3. Summary of Theil-Sen regression gradients for the FFDI metrics in the six study areas during the multiple fire day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	0.193	0.524	0.810	**0.196**	1.871	0.280	0.402
M_e	0.205	0.513	0.837	0.197	1.631	0.311	0.412
M_t	0.179	0.505	0.995	0.250	5.736	0.467	0.486
M_l	**0.172**	**0.502**	0.980	0.228	4.415	0.404	0.453
M_m	0.235	0.629	0.976	0.274	2.934	0.421	0.525
M_a	0.205	0.525	0.977	0.234	2.967	0.277	0.401
M_d	0.216	0.542	1.057	0.268	**1.391**	0.410	0.476
S_h	0.176	0.527	0.951	0.210	1.897	0.334	0.430
S_b	0.193	0.517	0.934	0.207	2.224	0.319	0.418
S_a	0.196	0.502	0.929	0.209	2.641	**0.270**	**0.386**
$S_d{}^C$	0.201	0.525	0.893	0.201	2.220	0.291	0.408
S_n	0.219	0.542	**0.726**	0.302	3.951	0.719	0.631

Table S4. Summary of Theil-Sen regression intercepts for the FFDI metrics in the six study areas during the multiple fire day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	62.77	42.00	72.77	**73.84**	77.20	**75.24**	**73.31**
M_e	61.11	42.17	71.07	73.40	**80.97**	73.48	72.24
M_t	64.52	42.93	62.92	68.27	37.92	61.20	62.06
M_l	**65.87**	**43.22**	64.13	70.33	48.81	65.47	64.80
M_m	55.21	40.22	61.52	65.29	65.11	62.73	62.13
M_a	61.28	43.01	68.65	70.74	67.81	74.09	68.23
M_d	58.41	39.30	66.32	65.95	79.78	65.76	65.86
S_h	65.61	41.18	69.48	72.58	76.98	71.70	70.59
S_b	63.78	42.07	68.62	72.52	73.83	72.60	70.57
S_a	63.74	42.77	67.85	72.28	67.04	74.22	67.45
$S_d{}^c$	62.84	41.07	69.41	73.28	74.01	74.94	71.35
S_n	57.14	39.76	**78.22**	58.90	48.87	46.47	53.00

Table S5. Summary of Theil-Sen regression gradients for the FFDI metrics in the six study areas during the developed fire ignition day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	0.341	0.592	0.569	0.260	1.181	0.353	**0.461**
M_e	0.308	0.599	0.596	0.253	1.702	0.388	0.492
M_t	0.295	**0.576**	0.520	0.295	5.426	0.481	0.500
M_l	0.300	0.579	**0.486**	0.281	4.359	0.462	0.474
M_m	0.331	0.590	0.739	0.306	3.459	0.541	0.565
M_a	0.307	0.650	0.625	0.271	2.025	**0.352**	0.488
M_d	0.382	0.782	1.002	0.388	**0.896**	0.620	0.701
S_h	0.263	0.635	0.567	0.252	0.916	0.467	0.517
S_b	0.316	0.598	0.602	0.251	3.100	0.415	0.507
S_a	0.335	0.583	0.607	0.261	4.484	0.435	0.509
$S_d{}^c$	0.331	0.620	0.613	**0.247**	2.591	0.457	0.535
S_n	**0.245**	0.768	0.890	0.333	4.325	0.635	0.702

Table S6. Summary of Theil-Sen regression intercepts for the FFDI metrics in the six study areas during the developed fire ignition day analysis. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Yarra	Snowy	Median
M_h	62.39	50.53	71.21	**74.95**	86.47	**71.37**	**71.29**
M_e	63.54	49.74	69.53	74.56	82.47	69.70	69.61
M_t	66.34	50.35	71.89	71.02	42.91	62.00	64.17
M_l	65.73	50.57	**73.38**	72.29	51.73	63.39	64.56
M_m	61.01	**51.13**	58.57	71.60	67.53	59.10	60.05
M_a	63.78	49.18	71.71	74.85	79.01	70.83	71.27
M_d	57.54	34.47	54.14	63.48	88.57	54.27	55.90
S_h	69.43	47.26	73.08	74.57	**89.43**	66.90	71.26
S_b	**65.42**	49.69	70.94	74.50	65.01	67.90	66.66
S_a	63.61	50.37	69.45	74.08	51.84	66.54	65.08
$S_d{}^C$	63.87	48.61	70.35	74.86	70.49	66.43	68.39
S_n	68.84	36.92	60.20	63.47	53.18	53.26	56.73

Table S7. Summary of Theil-Sen regression gradients for the FFDI metrics during the large fire day analysis in the five study areas with sufficient data. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Snowy	Median
M_h	0.918	1.675	1.398	0.397	**0.798**	0.918
M_e	0.709	1.687	1.545	0.592	0.841	0.841
M_t	0.705	1.654	1.448	0.295	0.902	0.902
M_l	0.771	1.640	1.441	**0.237**	0.917	0.917
M_m	0.868	2.704	2.167	0.318	1.043	1.043
M_a	1.087	1.801	**1.279**	0.362	0.888	1.087
M_d	0.877	1.689	2.829	0.513	1.697	1.689
S_h	0.644	1.860	1.669	0.417	0.913	0.913
S_b	0.633	**1.586**	1.465	0.483	0.894	0.894
S_a	**0.575**	1.660	1.467	0.377	0.814	**0.814**
$S_d{}^C$	0.657	1.780	1.586	0.514	0.994	0.994
S_n	1.111	1.807	2.968	0.714	1.789	1.789

Table S8. Summary of Theil-Sen regression gradients for the FFDI metrics during the large fire day analysis in the five study areas with sufficient data. The best performing metrics at each study area are bolded.

	Perth Hills	Wellington	Donnelly	Midlands	Snowy	Median
M_h	76.44	**68.65**	73.04	86.88	**73.63**	**73.63**
M_e	81.40	67.41	69.84	82.01	72.10	72.10
M_t	80.86	65.01	70.25	88.43	71.17	71.17
M_l	79.75	66.20	70.06	**90.67**	71.32	71.32
M_m	73.45	49.82	56.75	87.99	66.66	66.66
M_a	72.02	68.58	**74.66**	87.77	70.78	72.02
M_d	77.18	66.49	45.81	83.64	54.62	66.49
S_h	81.82	66.58	70.42	86.30	70.64	70.64
S_b	82.83	67.95	72.28	85.11	71.78	72.28
S_a	**84.30**	65.75	69.97	86.33	73.45	73.45
$S_d{}^C$	82.63	65.89	70.72	83.47	69.88	70.72
S_n	69.20	62.08	51.91	73.35	44.70	62.08

Table S9. Summary of Theil-Sen regression gradients and intercepts for the FFDI metrics during the very large fire day analysis in the three study areas with sufficient data. The best performing metrics at each study area are bolded.

	Gradients				Intercepts			
	Donnelly	Midlands	Snowy	Median	Donnelly	Midlands	Snowy	Median
M_h	3.307	0.294	1.755	1.755	66.99	96.06	81.54	81.54
M_e	3.276	0.313	2.102	2.102	65.87	95.30	79.42	79.42
M_t	3.467	0.409	**1.569**	**1.569**	68.27	94.12	**84.26**	**84.26**
M_l	3.492	0.384	1.673	1.673	67.41	94.52	84.10	84.10
M_m	5.582	0.588	3.039	3.039	45.08	92.75	71.00	71.00
M_a	3.844	**0.230**	1.905	1.905	66.41	**96.55**	80.92	80.92
M_d	5.383	0.402	5.387	5.383	52.06	94.85	53.45	53.45
S_h	3.217	0.588	3.244	3.217	70.02	92.65	73.65	73.65
S_b	**3.015**	0.423	1.838	1.838	**70.73**	94.18	81.06	81.06
S_a	3.597	0.639	1.755	1.755	66.17	91.57	82.21	82.21
$S_d{}^C$	3.134	0.451	1.829	1.829	69.21	93.93	82.71	82.71
S_n	7.194	1.585	4.878	4.878	47.58	78.25	44.31	47.58