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Quantitative assessment of fire and vegetation properties in simulations with fire-enabled vegetation models from the Fire Model Intercomparison Project

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Table S1: Full benchmarking table with all scores for each model, reference dataset and step considered.

	product	step	mean	random	CLM	CLASS-CTEM	JULES INFERNO	JSBACH SPITFIRE	LPJ-G GlobFIRM	LPJ-G SPITFIRE	SIMFIRE BLAZE	MC2	ORCHIDEE SPITFIRE
burnt area													
spatial	GFED4s	step1	1	1.07	0.60	0.81	0.63	0.67	0.73	0.84	0.83	0.69	0.71
	GFED4	step1	1	1.14	0.81	1.06	0.77	0.88	0.71	0.98	0.98	0.78	0.82
	MCD45	step1	1	1.07	0.68	0.94	0.68	0.74	0.72	0.93	1.00	0.71	0.81
	FireCCI4.0	step1	1	1.13	0.75	0.83	0.78	0.91	0.70	0.90	1.01	0.80	0.81
	FireCCI5.1	Step1	1	1.11	0.83	1.10	0.81	0.95	0.71	0.89	0.99	0.85	0.74
	GFED4s	step2	1	1.07	0.62	0.84	0.71	0.68	0.98	0.88	0.83	0.96	0.72
	GFED4	step2	1	1.14	0.84	1.12	0.76	0.89	0.98	1.00	1.02	0.99	0.91
	MCD45	step2	1	1.16	0.77	1.08	0.69	0.84	0.98	0.95	1.05	0.97	0.90
	FireCCI40	step2	1	1.13	0.77	0.91	0.78	0.92	0.99	0.91	1.05	1.02	0.88
	FireCCI51	Step2	1	1.11	0.85	1.14	0.84	0.96	0.98	0.90	1.01	1.02	0.77
	GFED4s	step3	1	1.07	0.63	0.79	0.72	0.70	1.06	0.94	0.88	1.00	0.72
	GFED4	step3	1	1.14	0.80	0.93	0.85	0.86	1.08	0.98	0.88	1.07	0.71
	MCD45	step3	1	1.16	0.65	0.81	0.72	0.69	1.12	0.93	0.92	1.02	0.70
	FireCCI40	step3	1	1.13	0.77	0.98	0.89	0.92	1.09	0.93	0.97	1.13	0.73
	FireCCI51	Step3	1	1.11	0.83	1.01	0.91	0.93	1.11	0.96	0.97	1.23	0.70
seasonal	GFED4s	step1	0.56	0.22	0.12	0.12	0.13	0.12		0.31			0.31
phase	GFED4	step1	0.49	0.47	0.34	0.35	0.41	0.42		0.33			0.31
	MCD45	step1	0.56	0.26	0.12	0.11	0.12	0.12		0.30			0.30
	FireCCI51	Step1	0.55	0.33	0.26	0.28	0.33	0.32		0.32			0.31
seasonal	GFED4s	step1	1	1.36	1.09	1.22	1.74	1.37		1.07			1.12

concentration	GFED4	step1	1	1.35	1.37	1.56	2.49	1.83		1.23		1.31
	MCD45	step1	1	1.36	1.26	1.40	2.40	1.70		1.15		1.23
	FireCCI51	Step1	1	1.36	1.48	1.72	2.75	2.06		1.26		1.45
	GFED4s	step2	1	1.36	1.07	1.20	1.14	1.28		1.06		1.13
	GFED4	step2	1	1.35	1.20	1.39	1.28	1.48		1.20		1.23
	MCD45	step2	1	1.36	1.18	1.31	1.29	1.49		1.15		1.21
	FireCCI51	Step2	1	1.36	1.27	1.53	1.38	1.64		1.22		1.34
	GFED4s	step3	1	1.36	1.16	1.15	1.24	1.15		1.13		1.22
	GFED4	step3	1	1.35	1.19	1.12	1.25	1.11		1.18		1.19
	MCD45	step3	1	1.36	1.14	1.08	1.26	1.13		1.12		1.20
	FireCCI51	Step3	1	1.36	1.25	1.22	1.33	1.21		1.20		1.27
IAV	GFED4s	step3	1	1.46	1.17	0.65	1.18	1.09	0.66	1.36	0.76	1.66	1.44
	GFED4	step3	1	1.27	0.98	1.62	1.23	0.89	1.04	1.08	1.00	1.41	1.25
	MCD45	step3	1	1.32	0.93	1.34	1.11	0.84	0.73	0.97	1.27	1.67	1.22
	FireCCI51	step3	1	1.42	1.18	1.53	1.24	1.27	1.73	1.27	1.23	1.87	1.12
fire emission													
spatial	GFAS	step1	1	1.08	0.72	1.12	0.74	0.81	0.75	0.94	0.95	0.64	1.11
		step2	1	1.08	0.74	1.33	0.79	0.91	0.97	0.98	0.98	0.99	1.22
		step3	1	1.08	0.78	0.85	0.73	0.74	1.13	1.03	0.91	1.06	0.86
seasonal phase	GFAS	step1	0.78	0.18	0.16	0.20	0.17	0.15		0.37			0.34
seasonal concentration	GFAS	step1	1	1.36	1.14	1.70	1.71	1.39		1.21			1.15
		step2	1	1.36	1.11	1.29	1.21	1.28		1.16			1.15
		step3	1	1.36	1.20	1.22	1.30	1.17		1.27			1.25

IAV	GFAS	step3	1	1.36	0.77	1.70	1.28	1.09	1.42	1.42	1.11	1.41	1.49
fire number													
spatial	Hantson	step3	1	1.19				0.96		0.83			0.76
fire size													
spatial	Hantson	step3	1	1.31				1.03		1.22			1.12
GPP													
spatial	Luyssaert	step1	1	1.39	2.71	1.28	1.39	1.48	2.45	1.83	2.17		1.80
		step2	1	1.39	1.32	1.23	1.33	1.15	1.13	1.01	1.07		0.95
		step3	1	1.39	1.49	1.41	1.46	1.39	1.41	1.24	1.37		1.09
spatial	Jung	step1	1	1.30	0.61	0.48	0.49	0.72	0.47	0.61	0.45		0.46
		step2	1	1.30	0.61	0.50	0.51	0.62	0.46	0.61	0.43		0.47
		step3	1	1.30	0.64	0.46	0.39	0.42	0.46	0.67	0.43		0.49
seasonal	Jung	phase	0.42	0.65	0.18	0.23	0.19	0.23		0.22			0.22
		step1	1	1.65	0.60	0.63	0.59	0.65		0.68			0.59
		step2	1	1.65	0.69	0.74	0.70	0.76		0.77			0.69
		step3	1	1.65	1.08	1.19	1.14	1.21		1.19			1.09
NPP													
spatial	Michaletz	step1	1	1.39	1.27	0.99	1.16	1.12	1.48	1.60	1.55	1.03	1.28
		step2	1	1.39	0.79	0.77	0.77	0.78	0.86	0.85	0.84	0.84	0.87
		step3	1	1.39	0.82	0.79	0.77	0.75	0.96	0.86	0.89	0.88	0.99
spatial	Luyssaert	step1	1	1.33	0.88	1.34	0.62	1.90	0.77	0.81	0.74	1.11	0.78
		step2	1	1.33	0.89	1.26	0.61	1.00	0.78	0.77	0.75	1.16	0.77

		step3	1	1.33	0.90	1.01	0.53	0.76	0.82	0.87	0.79	0.68	0.84
spatial	EMDI	step1	1	1.30	0.77	0.94	0.58	1.05	0.74	0.77	0.76	0.97	0.79
		step2	1	1.30	0.80	0.96	0.59	0.89	0.75	0.72	0.76	1.00	0.77
		step3	1	1.30	0.91	0.87	0.58	0.66	0.79	0.83	0.81	0.65	0.80
LAI													
spatial	MCD15	step1	1	1.29	0.96	0.76	0.78	0.88	0.69	1.85	0.66	1.89	
		step2	1	1.29	1.07	0.83	0.73	0.74	0.67	1.73	0.58	1.63	
		step3	1	1.29	0.60	0.53	0.44	0.78	0.70	0.61	0.57	0.63	
spatial	AVHRR	step1	1	1.34	1.38	1.43	1.03	0.74	0.79	2.57	0.81	2.58	
		step2	1	1.34	1.54	0.90	0.80	0.74	0.69	1.77	0.60	1.67	
		step3	1	1.34	0.81	0.71	0.49	0.65	0.74	0.62	0.61	0.64	
Carbon in vegetation													
spatial	Avitabile	step1	1	1.32	0.73	0.89	0.89	1.35	1.30	1.27	1.30	1.27	0.73
		step2	1	1.32	0.67	0.86	0.78	1.00	0.96	0.97	0.86	0.96	0.66
		step3	1	1.32	0.69	0.88	0.76	0.78	0.76	0.76	0.74	0.80	0.70
spatial	Carvalhais	step1	1	1.32	0.64	0.68	0.61	0.65	0.68	0.65	0.63	0.66	0.51
		step2	1	1.32	0.65	0.70	0.61	0.65	0.63	0.66	0.61	0.66	0.53
		step3	1	1.32	0.66	0.66	0.58	0.64	0.62	0.66	0.58	0.67	0.54

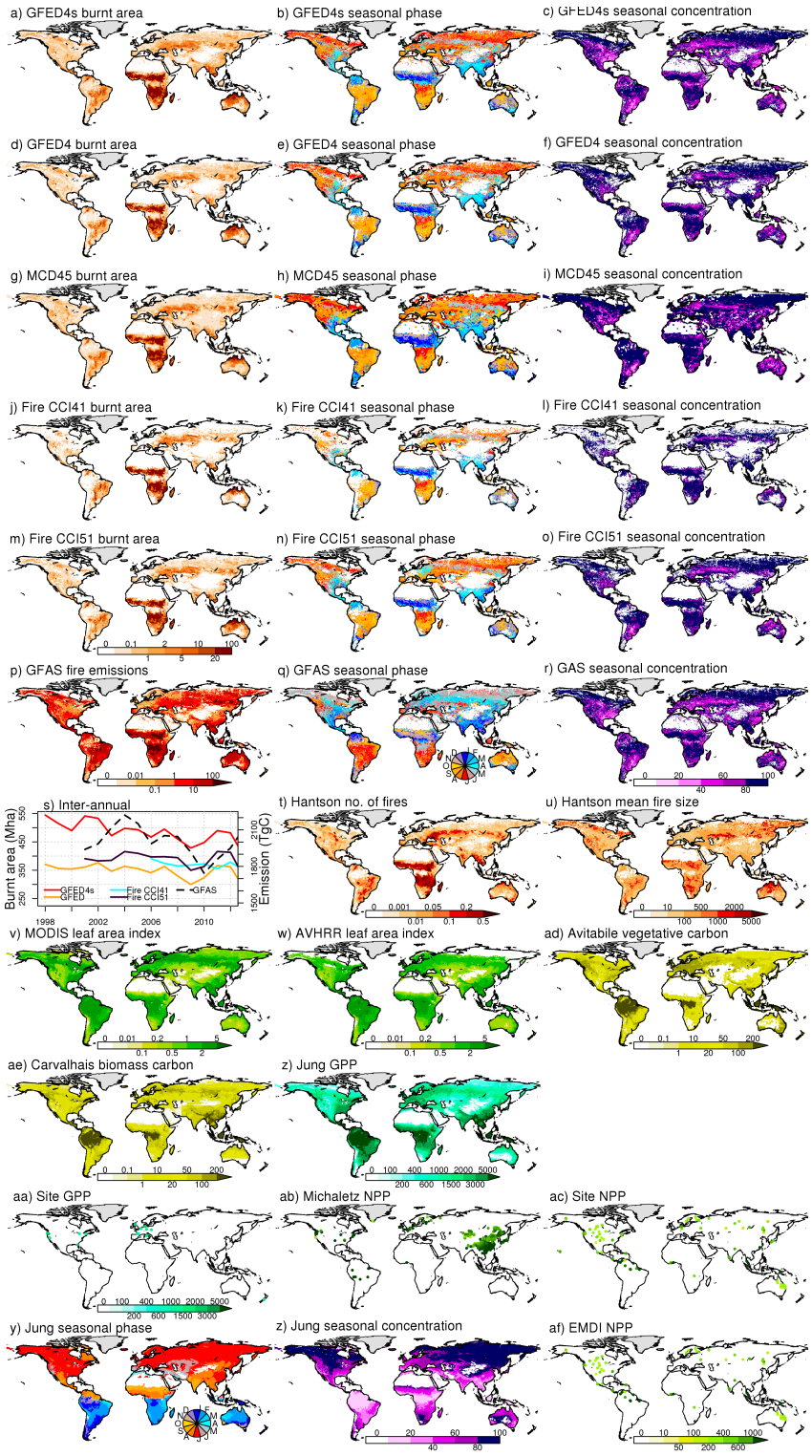

Figure S1: Overview of the reference datasets used.

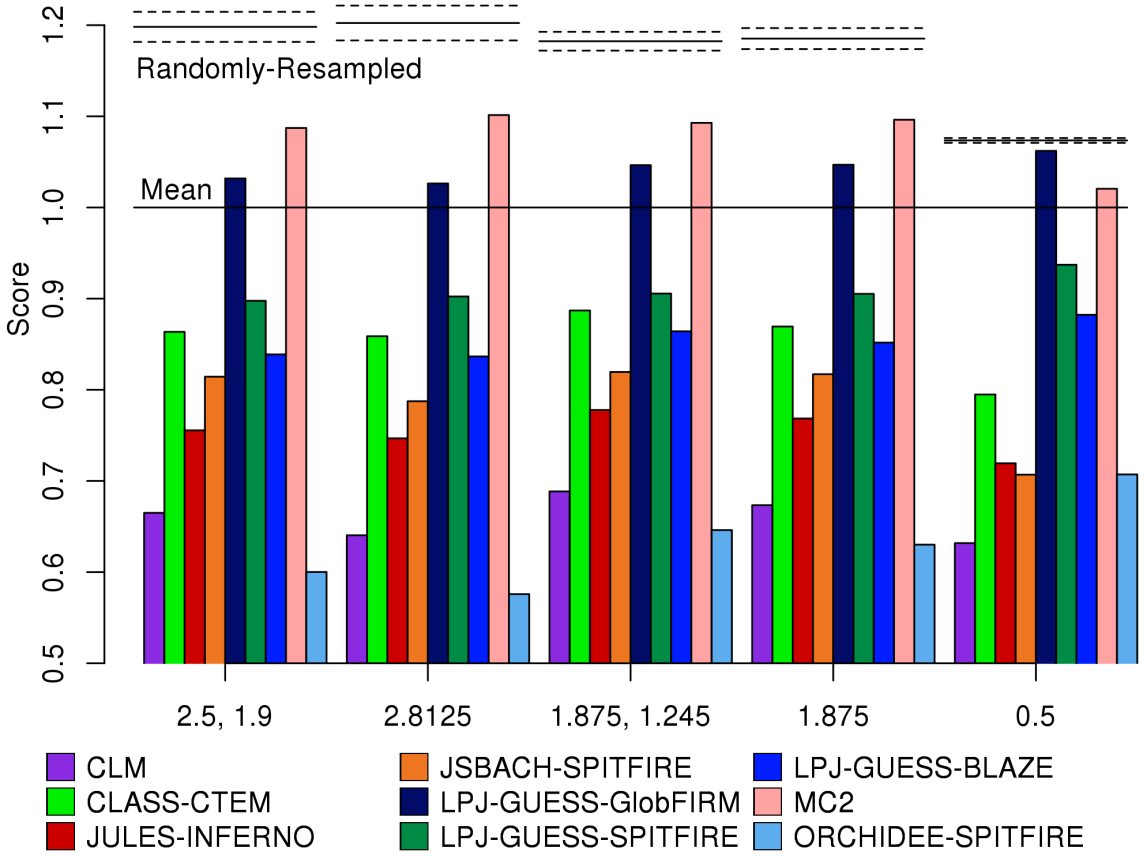

Figure S2: Benchmark scores for each model compared against GFED4s burnt area step 3 at different resolutions for CLM, CLASS-CTEM, JULES-inferno, JSBACH, LPJ-GUESS-GlobFIRM, LPJ-GUESS-SPITFIRE, LPJ-GUESS-BLAZE, MC2 and ORCHIDEE respectively. Each block (left to right) shows the comparison conducted by resampling model output and GFED4s to the 2.5 x 1.9° grid of CLM; 2.8125x2.8125° CLASS-CTEM grid; 1.875 x 1.25° JULES-INFERNO grid, 1.875x1.875° JSBACH-SPITFIRE grid; and the 0.5x0.5° grid used by all other models and for the benchmarking.