Trends in wildfire burn severity across Canada, 1985 to 2015

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Supplementary Material 5

SM5. Supplementary results for the ecozone analyses.

This SM presents the tables with the regression coefficient for the three analysis for the complete dataset and the coniferous subset. (Table S5.1, S5.2 and S5.3). It also presents the seasonality regression results per ecozones for both datasets (Figure S5.1) and a map of the significant relation between burn severity and time (figure S5.2).

Table S5.1. Parameter values and fit statistics of the regression equation of the median value of the quartiles of $dNBR_{event}$ as a function of Julian day periods for the ecozones. When the quadratic regression are significant, x^2 values are provided. The gray scale relates to the significance of the parameter, the red scale to that of the regression.

dNBR vs Julian day																	
		Median					Percentile 25 %					Percentile 75 %					
		Equation					Equation					Equation					
		b	x	x^2	R^2	p	b	x	x^2	R^2	p	b	x	x^2	R^2	p	n
Complete	**Canada**	-818.39337	14.07929	-0.03278	0.8646	0.00038	-1.08E+03	1.58E+01	-3.68E-02	0.9185	6.41E-05	-4.82E+02	1.16E+01	-2.68E-02	0.8598	0.000428	10
	Boreal Cordillera	-9.47E+02	1.46E+01	-3.34E-02	0.9384	9.88E-05	-1.13E+03	1.53E+01	-3.42E-02	0.9366	0.000108	-985.90	15.86	-0.04	0.8918	0.000534	9
	Boreal East	-1.67E+03	2.26E+01	-5.60E-02	0.8317	0.00201	-1.22E+03	1.69E+01	-4.09E-02	0.8592	0.001177	-1.79E+03	2.45E+01	-5.97E-02	0.8762	0.000801	9
	Boreal Plaine	68.6624	2.3103		0.8391	0.000122	-4.75E+02	7.34E+00	-1.34E-02	0.9114	8.59E-05	161.853	2.2989		0.7976	0.00031	10
	Boreal West	-5.87E+02	1.12E+01	-2.68E-02	0.844	0.000622	-8.23E+02	1.26E+01	-2.95E-02	0.8343	0.000769	-508.9473	11.29025	-0.02765	0.8441	0.000621	10
	Hudson Plain	255.9137	1.0623		0.858	0.000591	229.0298	0.8325		0.6098	0.01355	379.8289	0.7629		0.4714	0.036	8
	Montaine Cordillera	-1.13E+03	1.52E+01	-3.37E-02	0.7957	6.42E-05	-1.14E+03	1.43E+01	-3.12E-02	0.7455	0.000215	-1.25E+03	1.76E+01	-3.89E-02	0.7116	0.000428	14
	Taiga Cordillera	83.7679	2.2786		0.699	0.01183	-235.058	3.5601		0.8501	0.001962	135.8795	2.4542		0.6832	0.01352	7
	Taiga Plain	331.5278	0.6		0.1513	0.1633	-4.67E+02	7.89E+00	-1.77E-02	0.7404	0.007385	-6.44E+02	1.15E+01	-2.74E-02	0.6693	0.01526	9
	Taiga Shield East	224.7054	1.5917		0.3866	0.08044	223.2946	1.2988		0.3814	0.08237	-1.16E+03	1.74E+01	-4.20E-02	0.8246	0.01367	7
	Taiga Shield West	-1.58E+02	7.48E+00	-2.02E-02	0.8373	0.004607	-20.38616	5.218254	-0.014034	0.5274	0.06622	81.03683	5.488492	-0.014808	0.673	0.02637	8
Coniferous	**Canada**	-833.83243	13.94583	-0.032403	0.9601	5.28E-06	-973.6893	14.57936	-0.034266	0.974	1.17E-06	-643.2848	12.87894	-0.029785	0.9141	7.71E-05	10
	Boreal Cordillera	-961.1625	14.65849	-0.033054	0.8661	0.005285	-1086.333	15.23694	-0.034694	0.9235	0.000189	-1178.688	18.22136	-0.043311	0.8482	0.001477	9
	Boreal East	-921.25074	13.99206	-0.032632	0.8003	0.007683	203.9345	1.3151		0.7786	0.00318	-1737.971	23.56667	-0.057854	0.9039	0.000842	8
	Boreal Plaine	87.0476	1.7846		0.7884	0.00086	-54.8569	2.1487		0.8931	7.56E-05	199.1845	1.6058			0.01124	9
	Boreal West	-568.459	10.30965	-0.024049	0.9114	8.59E-05	-687.1167	10.73677	-0.024781	0.929	3.96E-05	-483.1559	10.16686	-0.024021	0.9306	3.66E-05	10
	Hudson Plain	352.6607	0.5357		0.1125	0.2186	259.6637	0.7456		0.621	0.01235	436.6771	0.4319		0.04693	0.2903	8
	Montaine Cordillera	-1005.1068	13.46183	-0.028482	0.8146	0.000206	-867.6397	10.86981	-0.021961	0.6257	0.00487	293.4997	1.5407		0.4146	0.01416	12
	Taiga Cordillera	105.5804	2.2083		0.6688	0.0152	-273.5312	3.7994		0.8554	0.00179	126.2455	2.5887		0.7552	0.006911	7
	Taiga Plain	-795.98845	11.97599	-0.0278	0.4843	0.05785	-519.6009	8.350354	-0.018805	0.6604	0.01653	-982.3919	14.59453	-0.034375	0.7285	0.008443	9
	Taiga Shield East	267.9732	1.4131		0.4624	0.05569	227.0893	1.2929		0.4513	0.05893	-1249.717	18.35794	-0.0443	0.8204	0.01434	7
	Taiga Shield West	-163.03348	7.13254	-0.018399	0.4891	0.08045	-493.5047	9.854365	-0.025169	0.7334	0.01583	609.9926	-0.1915		0.00654	0.3459	8

p > 0.05
p < 0.05
p < 0.001

p > 0.05
p < 0.05
p < 0.01
p < 0.001

Table S5.2. Parameter values and fit statistics of the regression equations for median values of annual quartilesof $dNBR_{event}$ as a function of annual area burned per ecozones, for the complete and coniferous datasets. N is the number of years with more than 5 events totalising at least 1000 pixels. The gray scale relates to the significance of the parameter, the red scale to that of the regression.

dNBR vs annual area burned																	
		Median					Percentile 25 %					Percentile 75 %					
		Equation					Equation					Equation					
		b	x	x^2	R^2	p	b	x	x^2	R^2	p	b	x	x^2	R^2	p	n
Complete	**Canada**					0.1359					0.2573					0.5417	31
	Boreal Cordillera					0.1719					0.2608					0.2037	29
	Boreal East					0.1722					0.5267					0.5343	31
	Boreal Plaine	4.62E+02	-1.45E-04		0.146	0.01939	3.57E+02	-1.56E-04		0.2117	0.005369	5.85E+02	-3.91E-04	4.05E-10	0.2262	0.0105	31
	Boreal West					0.1569					0.1573					0.1772	31
	Hudson Plain					0.8812					0.9121					0.8987	30
	Montaine Cordillera					0.7387					0.346					0.5602	31
	Taiga Cordillera					0.297					0.2296					0.4122	29
	Taiga Plain					0.815					0.5453					0.4715	31
	Taiga Shield East					0.9304					0.3597					0.697	31
	Taiga Shield West					0.1928					0.223					0.709	31
Coniferous	**Canada**					0.193					0.3895					0.297	31
	Boreal Cordillera					0.1105					0.1853					0.2087	28
	Boreal East					0.1616	3.41E+02	1.27E-03	-4.04E-09	0.175	0.02577					0.3325	31
	Boreal Plaine					0.09207	331.2816	-0.00058			0.02144					0.1485	31
	Boreal West					0.9047					0.7488					0.8994	31
	Hudson Plain					0.3762					0.9712					0.6661	29
	Montaine Cordillera					0.2709					0.6809					0.5786	30
	Taiga Cordillera					0.2422					0.2007					0.2861	25
	Taiga Plain					0.7118					0.8496					0.3322	31
	Taiga Shield East					0.4394					0.7844					0.3543	31
	Taiga Shield West					0.7056					0.5978					0.9068	31

			p > 0.05
	p > 0.05		p < 0.05
	p < 0.05		p < 0.01
	p < 0.001		p < 0.001

Table S5.3. Parameter values and fit statistics of the regression equations for median values of annual quartilesof $dNBR_{event}$ as a function of year (from 1985 to 2015) by ecozone for the complete data set and the coniferous subset. N is the number of years with more than 5 events totalising at least 1000 pixels. The gray scale relates to the significance of the parameters, the red scale to that of the regression. Note that a negative R^2 indicates that the model fit is worse than a horizontal line (i.e. using the mean).

dNBR over time (1985-2015)																	
		Median					Percentile 25 %					Percentile 75 %					
		Equation					Equation					Equation					
		b	x	x^2	R^2	p	b	x	x^2	R^2	p	b	x	x^2	R^2	p	n
Complete	**Canada**	3581.927	-1.5567	-	0.2277	0.00389	3030.601	-1.3373	-	0.07862	0.06924	2978.077	-1.202	-	0.1626	0.01409	31
	Boreal Cordillera	-1783.5	1.152	-	-0.02392	0.5614	-3222.17	1.808	-	-0.01658	0.4674	-148.863	0.3885	-	-0.03549	0.8425	29
	Boreal East	-1455.9	0.9593	-	-0.00275	0.346	-456.968	0.4087	-	-0.02793	0.6705	-2322.07	1.449	-	0.0156	0.2343	31
	Boreal Plaine	2472.823	-1.016	-	-0.01518	0.4637	2649.948	-1.158	-	-0.00488	0.3629	2189.5	-0.819	-	-0.01797	0.4983	31
	Boreal West	1369.807	-0.4338	-	-0.01892	0.511	2.66E+02	6.39E-02	-	-0.03427	0.9394	1315.419	-0.3614	-	-0.02337	0.579	31
	Hudson Plain	2634.241	-1.1008	-	0.008314	0.2763	2898.508	-1.266	-	0.02002	0.2207	2050.304	-0.7699	-	-0.01461	0.4465	30
	Montaine Cordillera	8955.621	-4.2662	-	0.3918	9.93E-05	8173.234	-3.929	-	0.3013	0.000821	10937.42	-5.187	-	0.3272	0.000461	31
	Taiga Cordillera	2872.058	-1.193	-	-0.02799	0.5773	7202.193	-3.4	-	0.0476	0.1467	2950.456	-1.195	-	-0.02771	0.5733	29
	Taiga Plain	4413.347	-1.9927	-	0.187	0.00876	3271.282	-1.4624	-	0.0625	0.09389	4167.456	-1.8292	-	0.1131	0.03618	31
	Taiga Shield East	2222.847	-0.8567	-	-0.01182	0.4268	1519.811	-0.5479	-	-0.0301	0.7278	-55.3629	0.3189	-	-0.03231	0.8066	31
	Taiga Shield West	3865.234	-1.6803	-	0.1773	0.0106	4569.952	-2.077	-	0.1862	0.008906	3333.173	-1.3805	-	0.0972	0.04881	31
Coniferous	**Canada**	1727.524	-0.6279	-	-0.00018	0.3269	1715.141	-0.6705	-	-0.00345	0.3515	1611.194	-0.5236	-	-0.00814	0.3911	31
	Boreal Cordillera	-4621.98	2.586	-	0.03354	0.1758	-272.582	0.363	-	-0.03698	0.8489	-3874.5	2.262	-	0.02286	0.2128	28
	Boreal East	-1281.98	0.8743	-	-0.01643	0.4787	-547.476	0.4588	-	-0.02945	0.7093	-3839.94	2.204	-	0.0414	0.1406	31
	Boreal Plaine	1705.218	-0.6587	-	-0.0247	0.6028	2503.726	-1.096	-	-0.00733	0.3839	787.9234	-0.1556	-	-0.03405	0.913	31
	Boreal West	-686.621	0.5848	-	-0.01299	0.4391	-816.399	0.6073	-	-0.01682	0.4835	-13.1855	0.2857	-	-0.03005	0.7263	31
	Hudson Plain	1905.777	-0.7336	-	-0.01462	0.4466	2567.069	-1.0942	-	0.01223	0.256	1381.21	-0.4327	-	-0.02661	0.6047	29
	Montaine Cordillera	4088.734	-1.816	-	0.0465	0.1315	4145.95	-1.8978	-	0.08356	0.06656	4637.193	-2.027	-	0.0347	0.164	30
	Taiga Cordillera	4046.864	-1.77	-	-0.01424	0.4238	7623.652	-3.604	-	0.03891	0.1736	2323.897	-0.8757	-	-0.03673	0.7025	25
	Taiga Plain	6449.613	-3.0117	-	0.3848	0.000118	4512.036	-2.0793	-	0.1751	0.01107	6083.04	-2.7858	-	0.2162	0.004909	31
	Taiga Shield East	756.2823	-0.1388	-	-0.03411	0.9192	2306.625	-0.9439	-	-0.0166	0.4808	605.3468	-0.01305	-	-0.03448	0.9913	31
	Taiga Shield West	1748.307	-0.624	-	-0.01279	0.437	3108.988	-1.344	-	0.04765	0.1246	1739.657	-0.5851	-	-0.01413	0.4517	31

	p > 0.05		p > 0.05
	p < 0.05		p < 0.05
	p < 0.001		p < 0.01
			p < 0.001

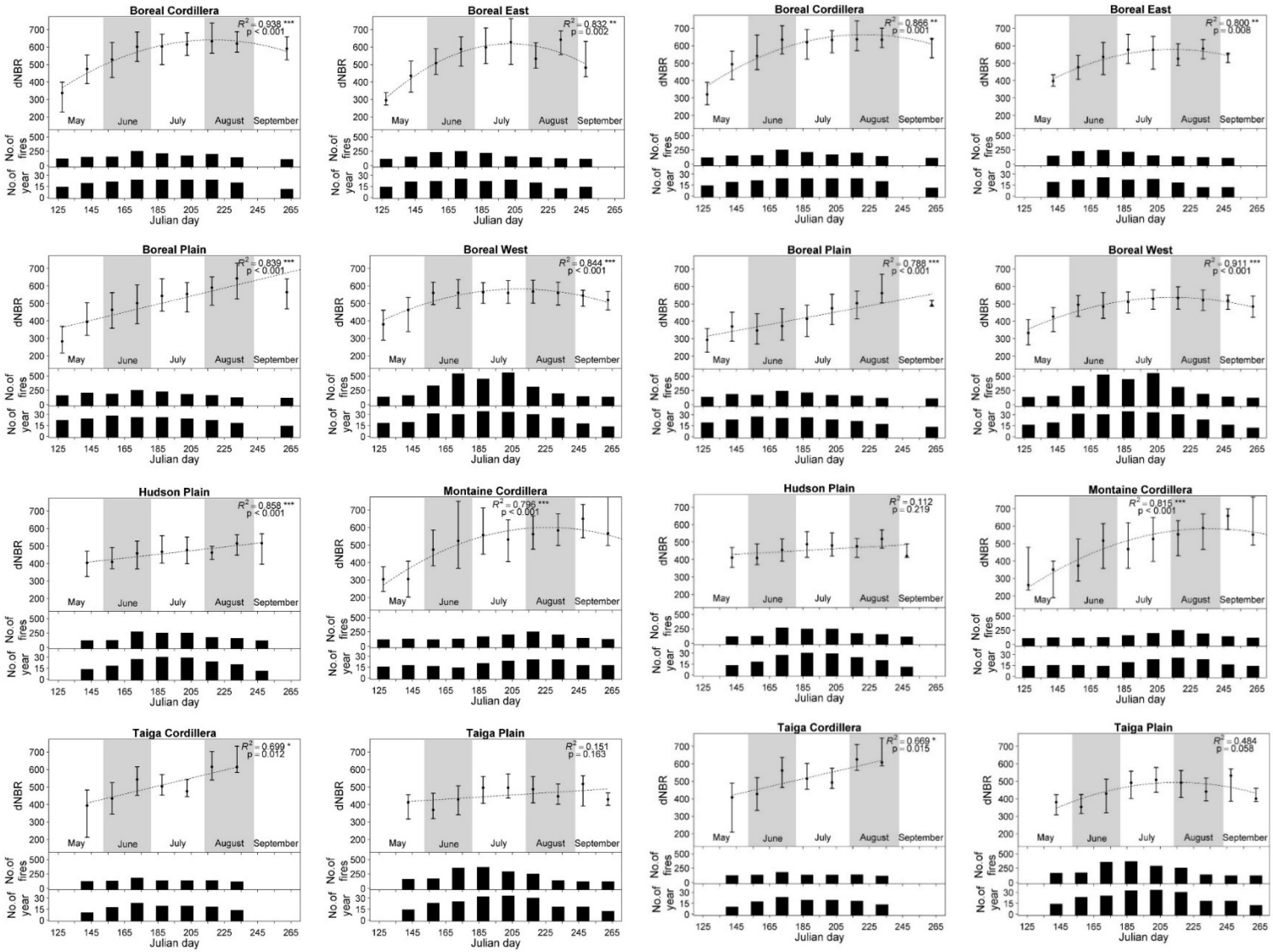

Figure S5.1. Bi-weekly (15 julian days) median of quartile values of $dNBR_{event}$ for all events >1 ha during the 1985-2015 period by ecozones. For any given year, only periods with more than five events that totaled at least 1000 pixels were included in the analysis. Also shown are the number of fire events and of the number of years used in the analysis for each period. A) Complete (all species) fire data set, and B) Coniferous subset. Values of R^2 and p are for the regression on the median values.

A) Complete data set

B) Coniferous subset

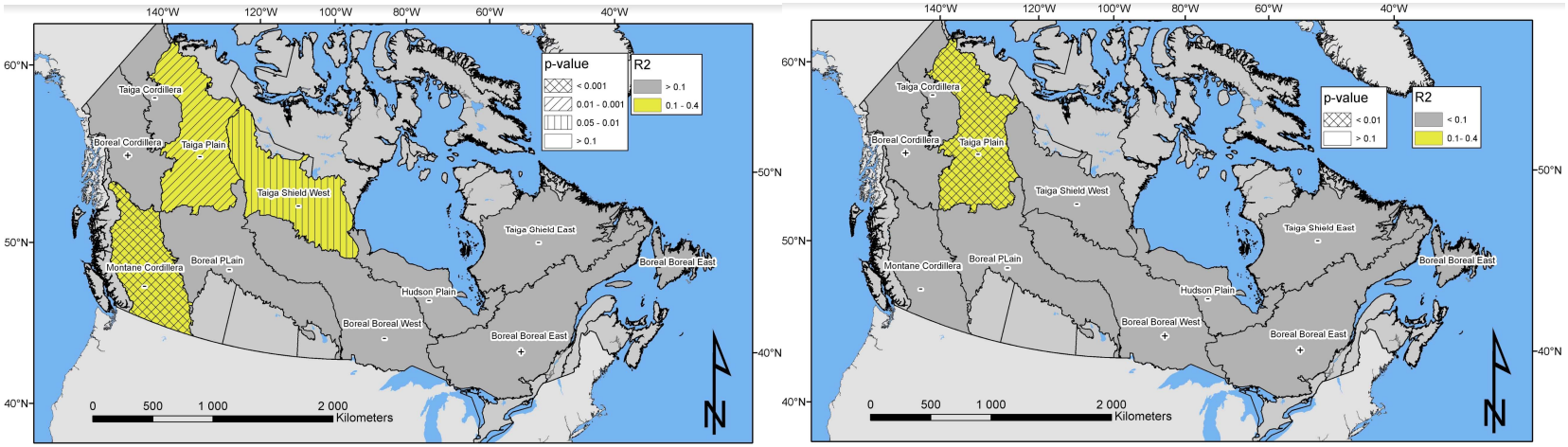

Figure S5.2. Map showing the significant increase (+) or decrease (-) in $dNBR_{event}$ (median value) over time (1985-2015) with R^2 and P value per ecozone. A) Complete data set; B) coniferous subset.