

Ecography

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2013. Temperate tree expansion into adjacent boreal
forest patches facilitated by warmer temperatures. –
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Supplementary material

Appendix 1

Table A1. Environmental shifts across local temperate-boreal ecotones in the Great Lakes region, USA. The fixed effect (predictor) was overstory boreal relative abundance, varying from 0-1 and reflecting the gradient in overstory composition across local ecotones, and the random effect in the model was ‘Site’.

Transformation	Response	Fixed effect value	Std. Error	DF	t-value	p-value
ln(x)	Canopy openness	0.31	0.06	330	4.96	< 0.0001
	Slope position	-0.42	0.15	330	-2.90	0.004
	Soil pH	-0.02	0.06	330	-0.41	0.68
x ²	Soil sand fraction	-10.90	16.13	330	-0.46	0.65
sqrt(x)	Litter thickness (Oi)	-0.17	0.04	330	-4.27	< 0.0001
ln(x)	Organic layer (Oe + Oa)	0.13	0.08	330	1.59	0.11
sqrt(x)	Ground vegetation cover	1.01	0.34	330	2.99	0.003
ln(x)	Shrub density (seedling)	1.05	0.51	330	2.05	0.04
ln(x)	Shrub density (sapling)	0.46	0.57	330	0.81	0.42

1 **Table A2.** Summary data for explanatory variables used in linear mixed-effects models of
2 understory relative density. RA is the relative abundance of trees in the overstory layer defined
3 as the average of relative stem density and relative basal area. Summer temperature is the mean
4 based on June-August, 1988-2007 (from Daly et al. 2008). Data are from temperate-boreal
5 ecotonal stands in the Great Lakes region, USA.

Species	Conspecific tree RA		Overstory Boreal RA		Summer temperature	
	mean(sd)	min-max	mean(sd)	min-max	mean(sd)	min-max
<i>Betula papyrifera</i>	0.24(0.19)	0-1.0	0.64(0.24)	0.06-1.0	17.8(0.7)	16.1-19.0
<i>Populus tremuloides</i>	0.25(0.2)	0-0.94	0.65(0.22)	0.03-1.0	17.9(0.6)	16.7-19.0
<i>Abies balsamea</i>	0.18(0.17)	0-0.85	0.57(0.27)	0-1.0	17.8(0.6)	16.1-19.6
<i>Picea glauca</i>	0.18(0.15)	0-0.83	0.57(0.26)	0-1.0	17.8(0.6)	16.1-19.6
<i>Acer rubrum</i>	0.21(0.18)	0-0.86	0.53(0.28)	0-1.0	17.9(0.6)	16.1-19.6
<i>Acer saccharum</i>	0.22(0.22)	0-1.0	0.48(0.28)	0-1.0	17.8(0.6)	16.1-19.6
<i>Fraxinus nigra</i>	0.05(0.08)	0-0.39	0.54(0.26)	0-1.0	18.1(0.6)	16.1-19.6
<i>Ostrya virginiana</i>	0.03(0.04)	0-0.20	0.41(0.27)	0-1.0	18.2(0.5)	17.1-19.6
<i>Prunus serotina</i>	0.04(0.07)	0-0.43	0.53(0.27)	0-1.0	17.8(0.5)	17.1-19.6
<i>Quercus rubra</i>	0.10(0.15)	0-0.74	0.49(0.26)	0-1.0	18.1(0.5)	17.2-19.6