Extended Data Table 1 | Dominant ring- and diffuse-porous species at the Smithsonian Conservation Biology Institute (SCBI) and Harvard Forest, along with sample sizes included in this analysis.

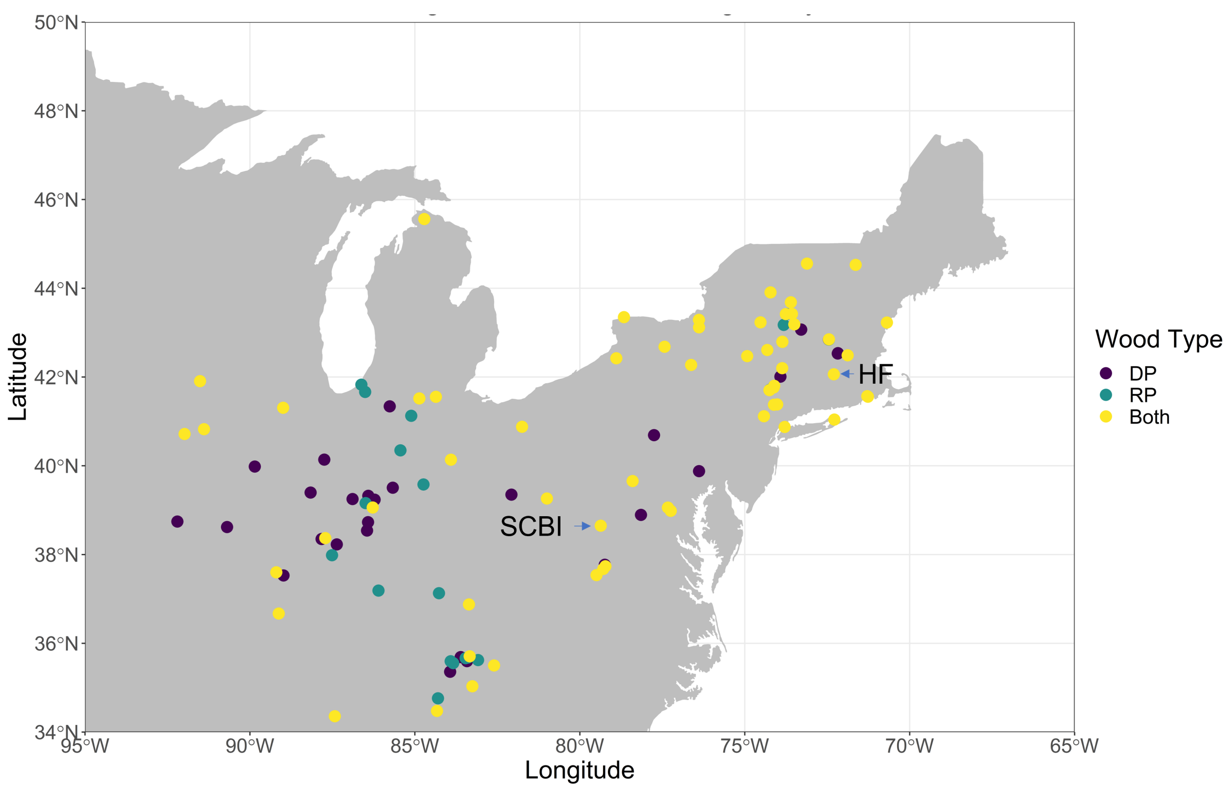
				dendrometer bands		tree cores	
site	xylem porosity	species	species code	n trees	n tree-years	n cores	date range
SCBI	ring	*Carya cordiformis*	CACO	0	0	18	1917-2009
		Carya glabra	CAGL	0	0	39	1901-2009
		Carya ovalis	CAOVL	0	0	24	1896-2009
		Carya tomentosa	CATO	0	0	17	1926-2009
		Fraxinus americana	FRAM	0	0	69	1910-2009
		Quercus alba	QURU	34	197	66	1904-2009
		Quercus montana	QUPR	0	0	67	1893-2009
		Quercus rubra	QUAL	35	229	71	1870-2009
		Quercus velutina	QUVE	0	0	83	1902-2009
	diffuse	*Fagus grandifolia*	FAGR	13	89	81	1932-2009
		Liriodendron tulipifera	LITU	41	354	109	1920-2009
Harvard	ring	*Fraxinus americana*	FRAM	9	27	34	1901-2008
		Quercus alba	QURU	118	575	179	1901-2014
		Quercus velutina	QUVE	11	50	0	
	diffuse	*Fagus grandifolia*	FAGR	8	45	0	
		Betula lenta	BELE	8	44	0	
		Betula populifolia	BEPO	5	24	0	
		Betula papyrifera	BEPA	3	13	0	
		Betula alleghaniensis	BEAL	21	90	44	1952-2013
		Prunus serotina	PRSE	9	37	0	
		Acer rubrum	ACRU	144	669	59	1930-2014
		Acer pensylvanicum	ACPE	4	16	0	

Extended Data Table 2 | Summary of parameters describing the phenology and rate of growth for ring- and diffuse- porous species at SCBI and Harvard Forest.

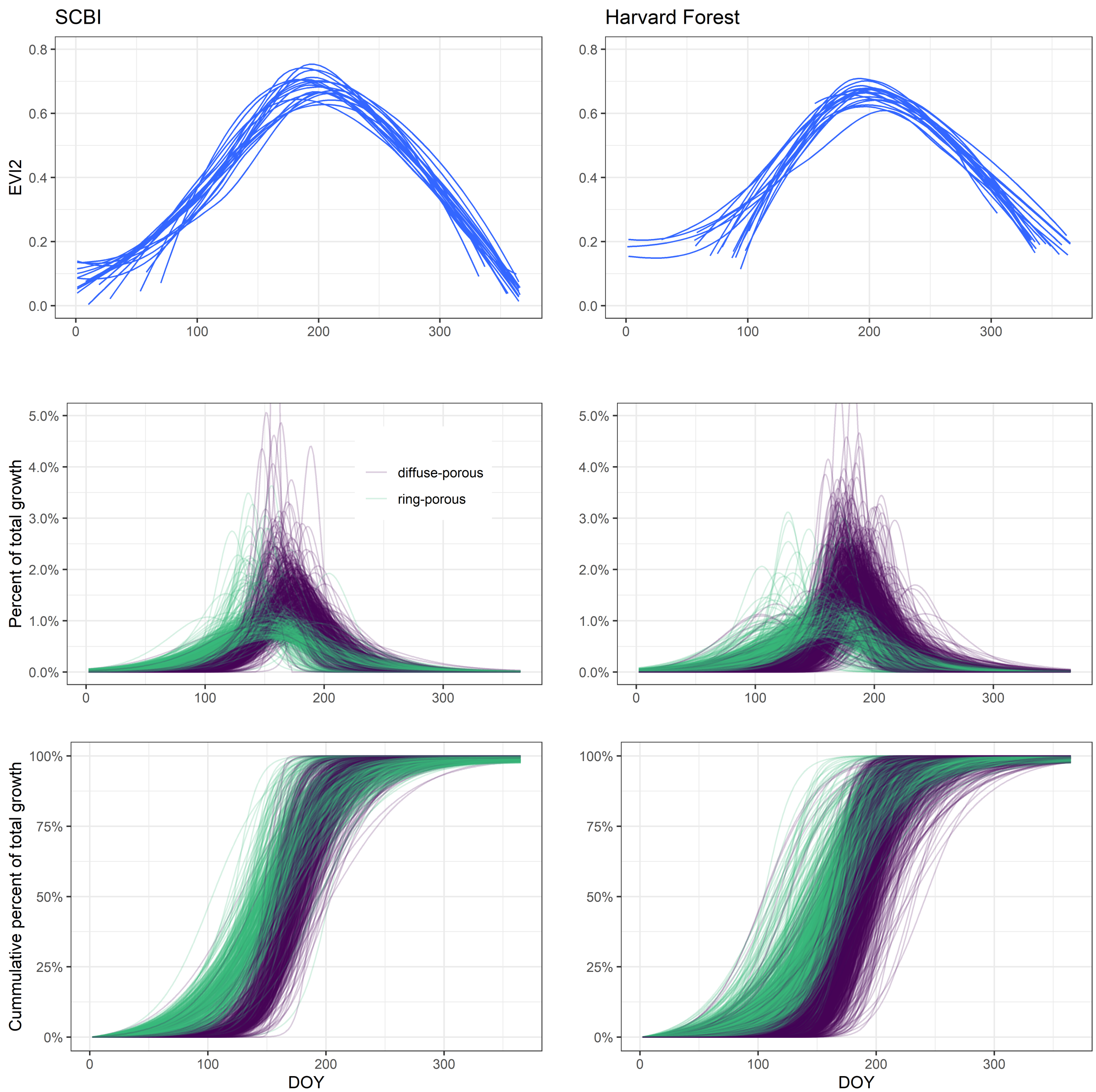
	SCBI		Harvard Forest	
	ring	diffuse	ring	diffuse
Stem Growth				
critical T_{max} window	3/22-4/9	2/19-5/21	4/2-5/7	3/19-5/7
DOY_{25}	123 (May 4)	154 (June 4)	132 (May 15)	164 (June 14)
DOY_{50}	152 (June 2)	172 (June 22)	159 (June 9)	182 (July 2)
DOY_{75}	180 (June 30)	190 (July 9)	186 (July 6)	199 (July 19)
$DOY_{g_{max}}$	152 (June 2)	173 (June 23)	161 (June 11)	183 (July 3)
g_{max} (mm/day)	0.046	0.061	0.03	0.025
L_{pgs}	56.5	35.8	54.5	35.1
ΔDBH (mm/yr)	4.7	3.6	3.1	1.4
Leaf Phenology (ecosystem level)				
Greenup	101 (April 11)		115 (April 25)	
Mid-greenup	120 (April 30)		137 (May 17)	
Peak	173 (June 22)		182 (July 1)	
Senescence	215 (Aug. 3)		218 (Aug. 6)	

Extended Data Table 3 | Summary of tree-ring chronologies analyzed and number of significant (at p=0.05) positive or negative correlations to monthly T_{max} in univariate and multivariate analyses.

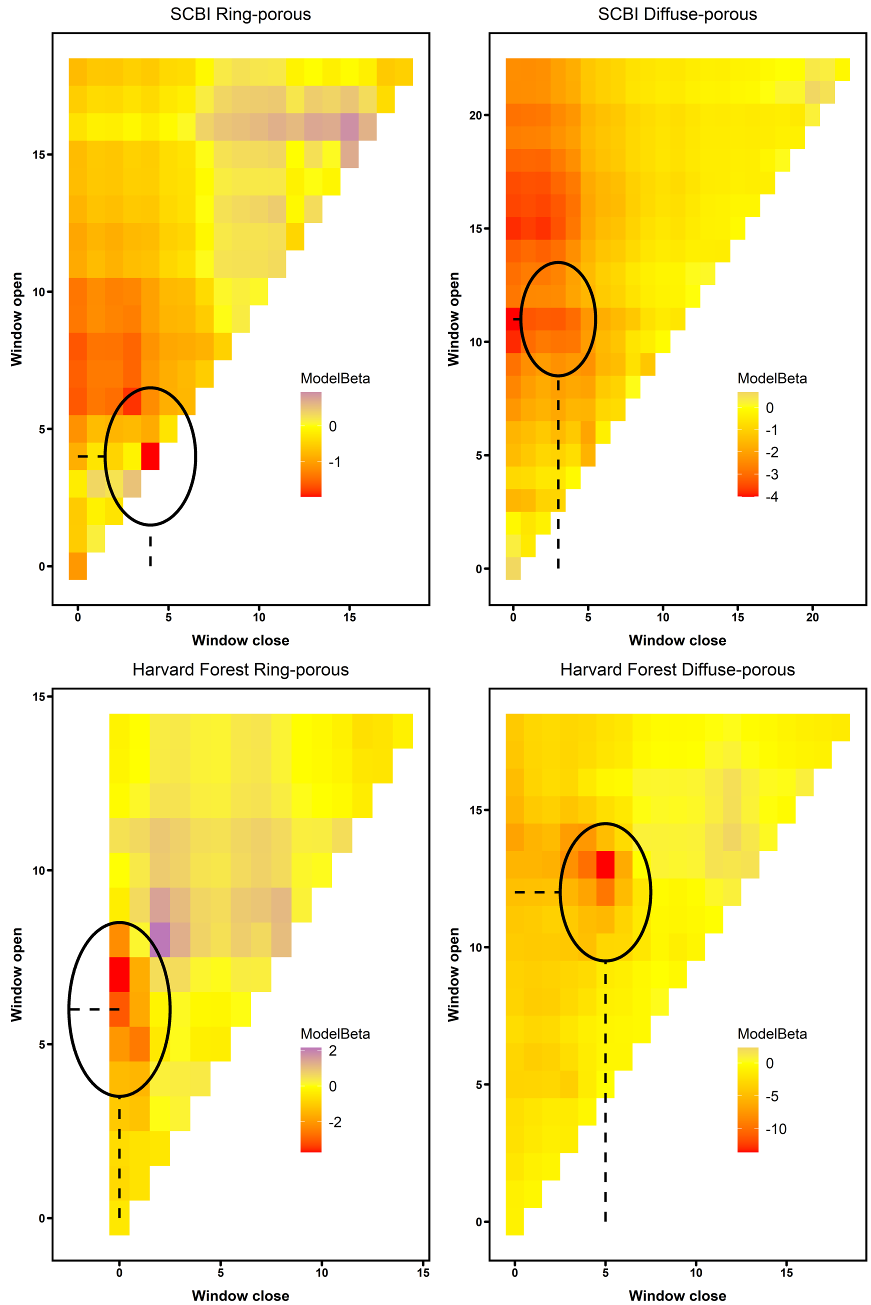
		n. correlations to monthly max. T significant at p=0.05													
		univariate analysis										multivariate analysis			
		April		May		June		July		Aug		April		June-July	
species	n	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Ring Porous															
Carya cordifomis	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1
Carya glabra	7	0	0	0	2	0	5	0	5	0	0	0	0	0	5
Carya ovalis	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0
Carya ovata	22	0	0	0	6	0	21	0	18	0	14	2	0	0	21
Carya tomentosa	2	0	0	0	1	0	2	0	0	0	2	0	0	0	1
Fraxinus americana	5	0	0	0	4	0	3	0	2	1	0	0	0	0	3
Fraxinus nigra	2	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Quercus alba	36	0	4	0	18	0	31	0	29	0	23	0	2	0	33
Quercus macrocarpa	1	0	0	0	0	0	1	0	1	0	1	0	0	0	1
Quercus mongolica	16	0	2	1	3	0	10	0	9	0	3	1	2	0	11
Quercus montana	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Quercus pagoda	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1
Quercus rubra	37	0	2	1	4	0	25	0	18	1	5	1	1	0	22
Quercus stellata	3	0	0	0	1	0	2	0	1	0	0	0	0	0	2
Quercus velutina	7	0	0	0	2	0	5	0	6	0	3	0	0	0	7
TOTAL	142	1	8	2	45	0	108	0	90	2	55	4	5	0	109
Diffuse Porous															
Acer rubrum	4	0	1	0	0	0	1	0	1	0	0	0	1	0	3
Acer saccharum	16	1	0	0	2	0	14	0	12	0	6	3	0	0	14
Betula alleghaniensis	2	0	0	0	0	0	2	0	0	0	0	0	0	0	1
Betula lenta	3	0	0	0	1	0	1	0	1	0	0	0	0	0	2
Fagus grandifolia	6	1	0	0	1	0	4	0	5	0	1	1	0	0	5
Liriodendron tulipifera	32	1	0	0	7	0	31	0	18	0	15	1	0	0	27
Magnolia acuminata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nyssa sylvatica	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Populus grandidentata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	66	3	1	0	11	0	53	0	37	0	22	5	1	0	52
TOTAL	**208**	**4**	**9**	**2**	**56**	**0**	**161**	**0**	**127**	**2**	**77**	**9**	**6**	**0**	**161**



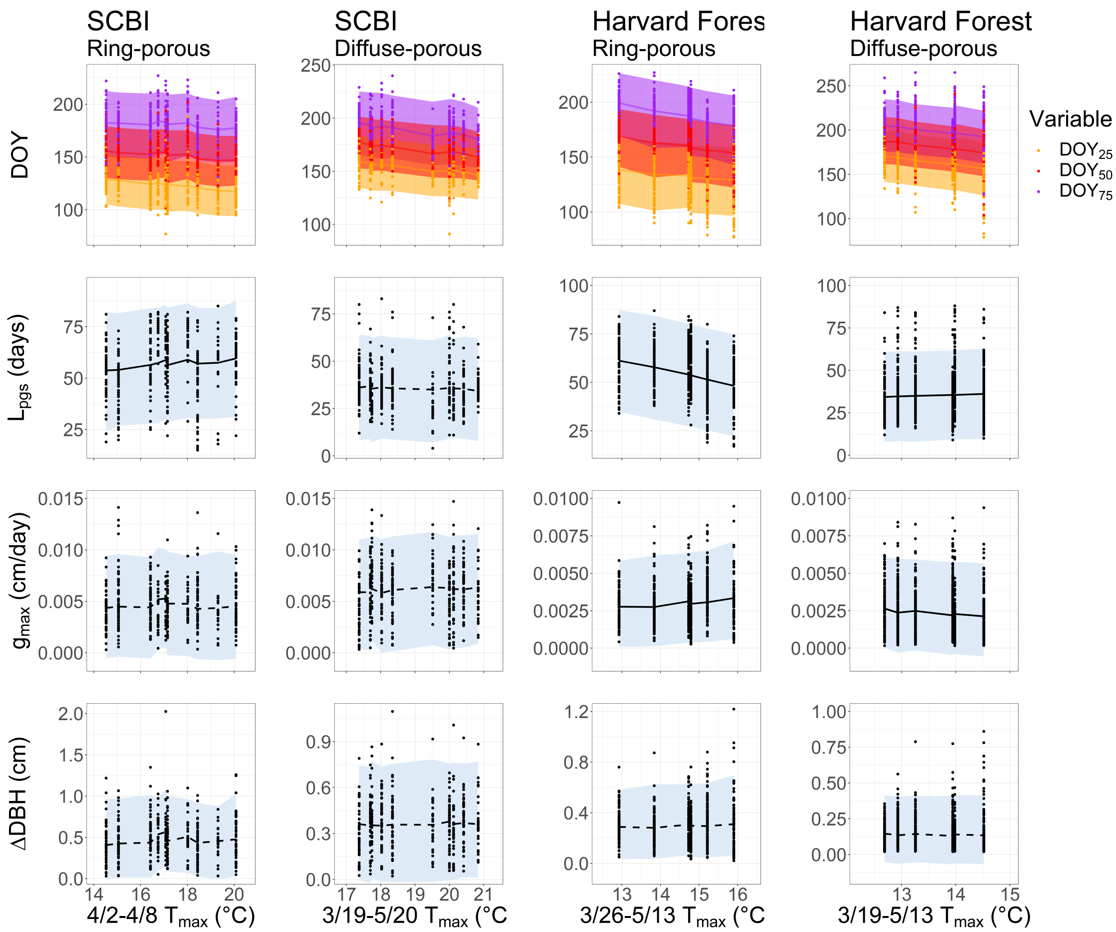
Extended Data Figure 1 | Map of sampling locations of tree-ring chronologies analyzed in this study. Sites are colored by the xylem porosity type of species sampled: ring poroous (RP), diffuse porous (DP), or both. Sampling details are provided in **SI TBALE NAME**



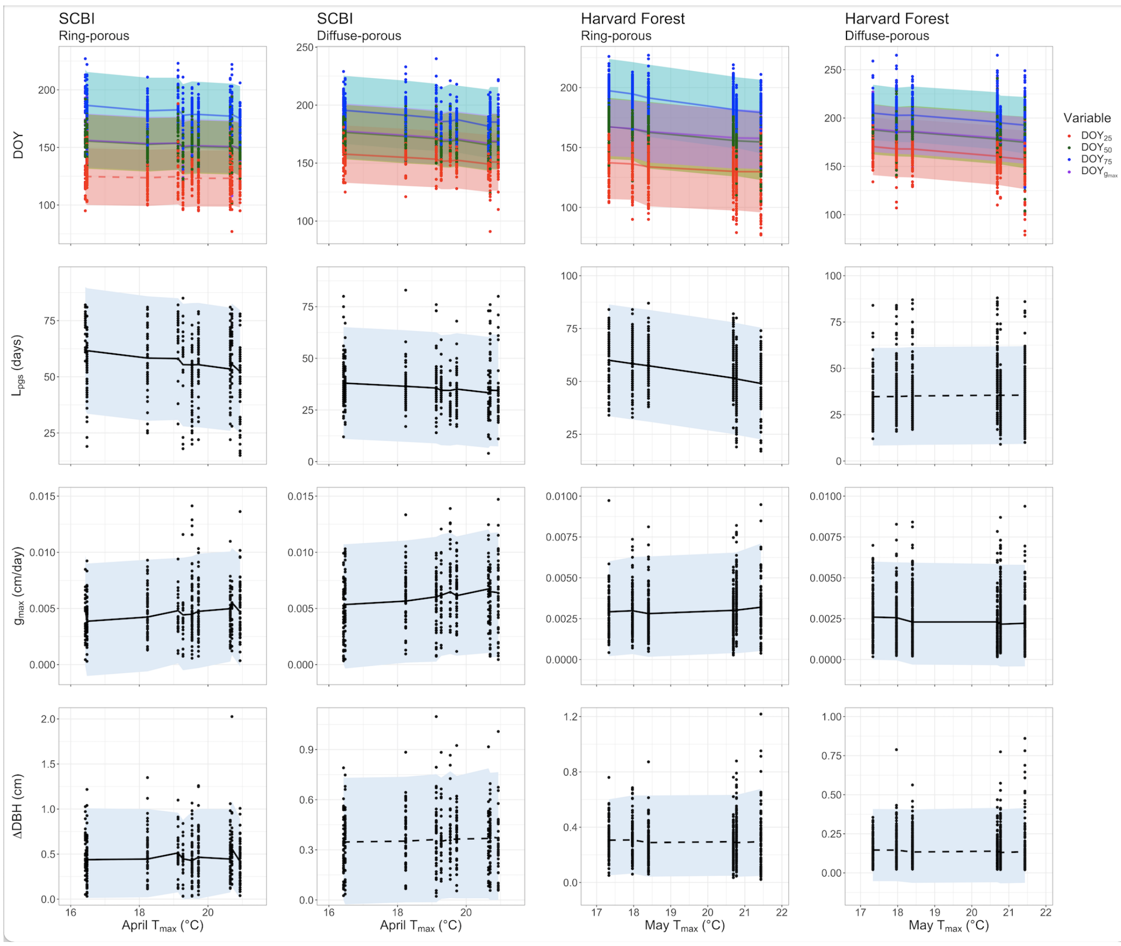
Extended Data Figure 2 | Phenological patterns of forest canopy greenness (top row) and stem growth of ring- and diffuse-porous trees, represented as both relative and cumulative fractions of total annual growth (middle and bottom rows, respectively), at our two focal study sites In the top row, canopy greenness is characterized using the two band Enhanced Vegetation Index (EVI2) . . . , with each line representing a year between 2001 and 2018. For stem growth, each line represents one year's growth for a given tree, fit with McMahon model.



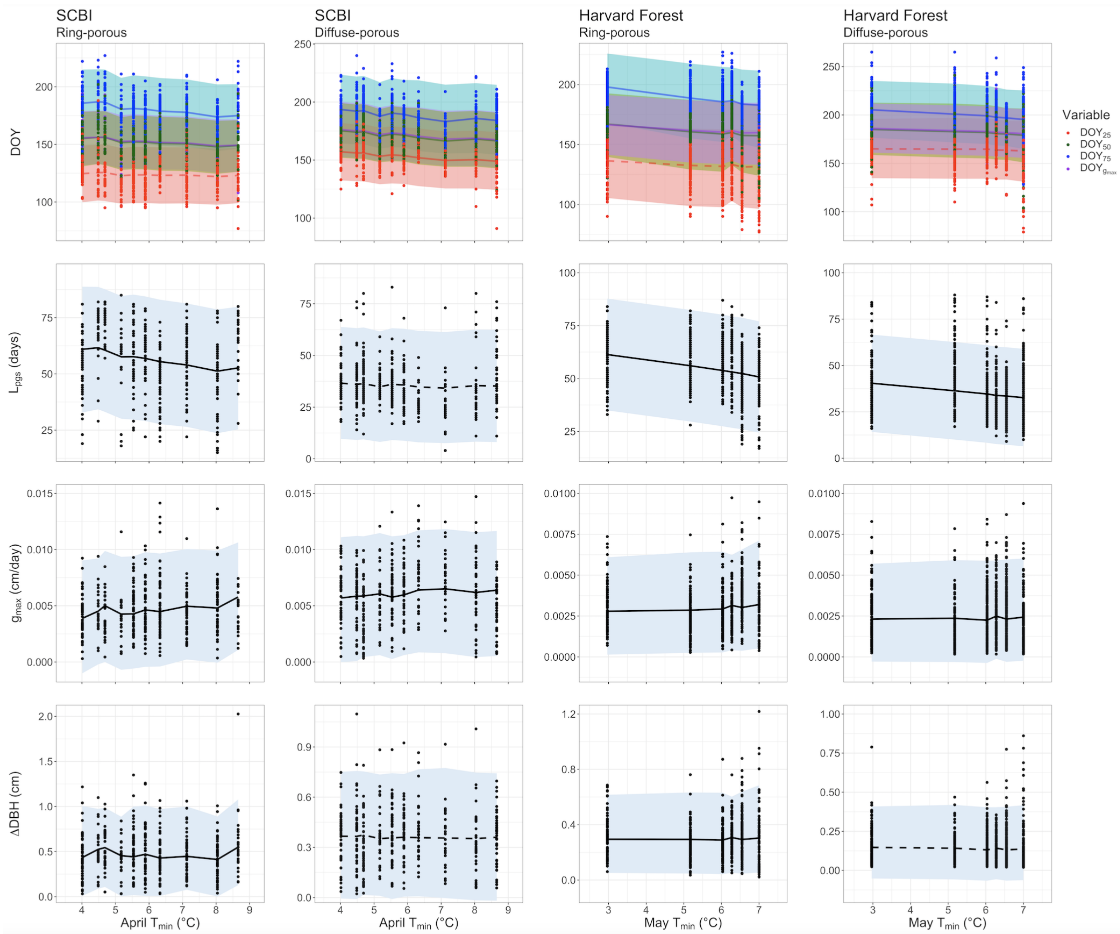
Extended Data Figure 3 | Landscapes of relationships between the day of year on which 25% of annual growth is achieved (DOY_{25}) and temperature in prior weeks for ring- and diffuse-porous trees at SCBI and Harvard Forest. Shown are matrices of linear coefficients of first-order linear regressions between temperature and DOY_{25}, where Window Open and Window Close indicate number of weeks prior to DOY_{25} (ring-porous: May 5 at SCBI, May 13 at HF; diffuse-porous: June 4 at SCBI, June 14 at HF). Black circles indicate the critical T_{max} window (ring-porous: March 22- April 9 at SCBI, April 2 - May 07 at HF; diffuse-porous: Feb. 19- May 21 at SCBI, March 19 - May 07 at HF).



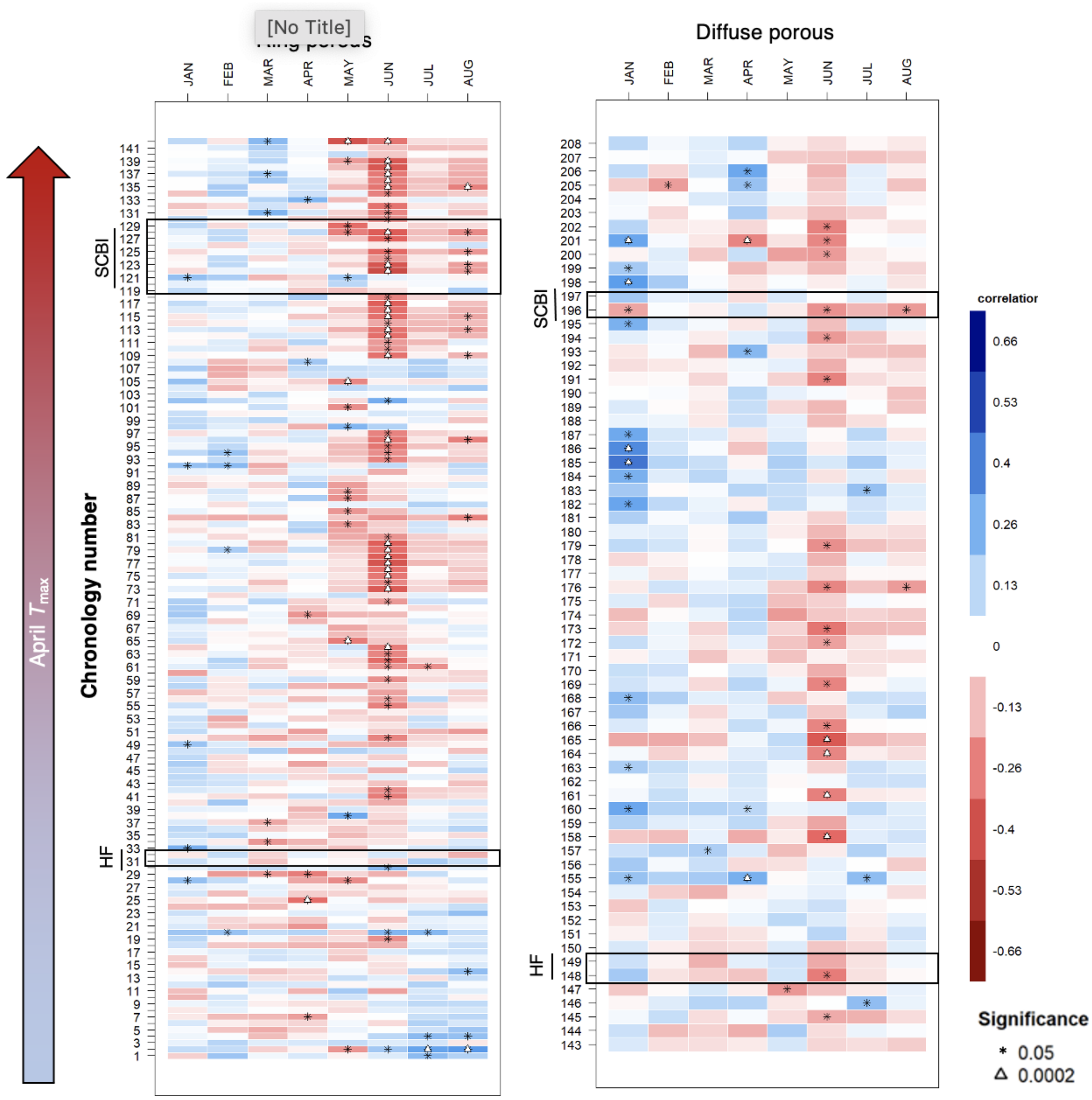
Extended Data Figure 4 | Response of the timing of stem growth phenology to spring temperatures. The days of year on which 25%, 50% and 75% of annual growth were acheived (DOY_{25}, DOY_{50}, and DOY_{75}, respectively) declined significantly with mean T_{max} during their respective critical temperature window (CTW). For each CTW T_{max}, the posterior mean of the fitted day of year is represented by the solid line and 95% credible intervals are represented by bands. (**FIGURE NEEDS SOME WORK/ MORE INFO. CAPTION NEEDS MORE DETAIL**)



Extended Data Figure 5 | Relationship between growth parameters and mean maximum temperature in April (SCBI) or May (HF). For each observed climwin mean temperature value, the posterior mean of the fitted day of year is represented by the solid blue line and 95% credible intervals are represented by bands.(**FIGURE NEEDS SOME WORK/ MORE INFO. CAPTION NEEDS MORE DETAIL**)



Extended Data Figure 6 | Relationship between growth parameters and mean minimum temperature in April (SCBI) or May (HF). For each observed climwin mean temperature value, the posterior mean of the fitted day of year is represented by the solid blue line and 95% credible intervals are represented by bands.(**FIGURE NEEDS SOME WORK/ MORE INFO. CAPTION NEEDS MORE DETAIL**)



Extended Data Figure 7 | Sensitivity of annual growth, as derived from tree-rings, to monthly minimum temperatures, for 207 chronologies from 114 sites across eastern North America (Extended Data Figure 1). Chronologies are grouped by xylem porosity and ordered by mean April T__max. Chronology details are given in the Supplementary Information. (**NOTE: Figure still needs some work. Chronology numbers are off.** See GitHub Issue #49.)