

Supplementary material

Fine-scale factors influence fire regimes in mixed-conifer forests on three high mountains in Mexico

Larissa L. Yocom^{AG}, Peter Z. Fulé^A, Donald A. Falk^B, Celia García-Domínguez^C, Eladio Cornejo-Oviedo^D, Peter M. Brown^E, José Villanueva-Díaz^F, Julián Cerano^F and Citlali Cortés Montaña^A

^ASchool of Forestry, PO Box 15018, Northern Arizona University, Flagstaff, AZ 86011, USA.

^BSchool of Natural Resources and the Environment, 325 Biological Sciences East, University of Arizona, Tucson, AZ 85721, USA.

^CDepartment of Ecology, School of Biology, University of La Laguna, 38206 San Cristóbal de La Laguna, Tenerife, Spain.

^DDepartment of Forestry, ‘Antonio Narro’ Autonomous Agrarian University, Calzada Antonio Narro 1923, 25084 Saltillo, Mexico

^ERocky Mountain Tree-Ring Research, 2901 Moore Lane, Fort Collins, CO, 80526 USA.

^FNational Institute of Forest, Agriculture, and Fisheries Research, National Center of Research on Water, Soil, Plants, and Atmosphere, Km 6.5 Margen Derecha Canal de Sacramento, C.P. 35140, Gómez Palacio, Durango, México.

^GCorresponding author. Email: larissa.yocom@gmail.com

Table S1. Chi-square contingency table of expected and observed values of fire co-occurring on zero, one, or two+ mountains

Expected values were estimated from joint probabilities of fire occurring or not occurring on the mountains. $\chi^2 = 5.441$, d.f. = 2, $P = 0.07$

	Observed	Expected
0 mountains	126	118
1 mountains	60	74
2+ mountains	22	16

Table S2. Chi-square contingency table of expected and observed values of fire co-occurring in pairs of sites within each mountain

Synchronous fire indicates that both sites recorded fire in a particular year; asynchronous fire indicates that only one site recorded fire

Site pair			All fires					Widespread fires				
			Observed	Expected	χ^2	d.f.	<i>P</i>	Observed	Expected	χ^2	d.f.	<i>P</i>
SA1	SA2	Synchronous fire	16	14.3	0.29	1	0.59	11	9.0	0.67	1	0.41
		Asynchronous fire	27	28.7				16	18.0			
SA1	SA3	Synchronous fire	11	14.3	1.16	1	0.28	8	9.3	0.29	1	0.59
		Asynchronous fire	32	28.7				20	18.7			
SA2	SA3	Synchronous fire	12	9.7	0.84	1	0.36	11	7.0	3.43	1	0.06
		Asynchronous fire	17	19.3				10	14.0			
LV1	LV2	Synchronous fire	7	7.0	0	1	1.00	7	4.0	3.38	1	0.07
		Asynchronous fire	14	14.0				5	8.0			
LV1	LV3	Synchronous fire	6	8.3	0.98	1	0.32	6	5.7	0.03	1	0.87
		Asynchronous fire	19	16.7				11	11.3			
LV2	LV3	Synchronous fire	11	7.3	2.75	1	0.10	8	4.7	3.57	1	0.06
		Asynchronous fire	11	14.7				6	9.3			
RN1	RN2	Synchronous fire	9	5.7	2.94	1	0.09	7	5.3	0.78	1	0.38
		Asynchronous fire	8	11.3				9	10.7			
RN1	RN3	Synchronous fire	8	9.7	0.43	1	0.51	4	6.7	1.6	1	0.21
		Asynchronous fire	21	19.3				16	13.3			
RN2	RN3	Synchronous fire	7	8.7	0.48	1	0.49	5	4.7	0.04	1	0.85
		Asynchronous fire	19	17.3				9	9.3			

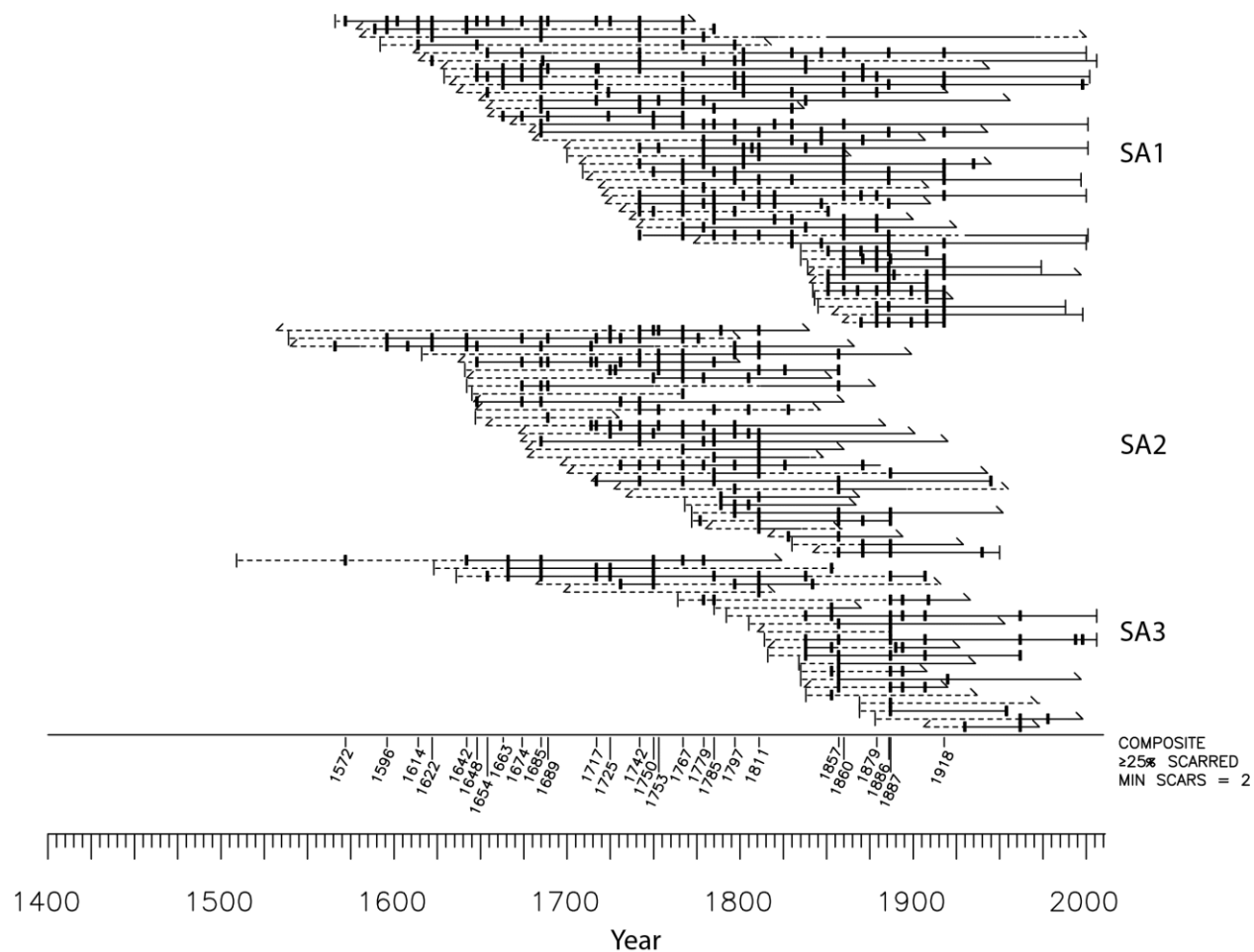


Fig. S1. Fire history graph for San Antonio: top, SA1; middle, SA2; bottom, SA3. Horizontal lines represent individual tree samples, solid horizontal lines represent periods when the sample was recording and dashed horizontal lines represent periods when the sample was not recording. Bold vertical tick marks represent precisely dated fire scar dates. Vertical lines to the left represent pith dates and slanted lines to the left represent inside ring dates (i.e. unknown number of years to pith).

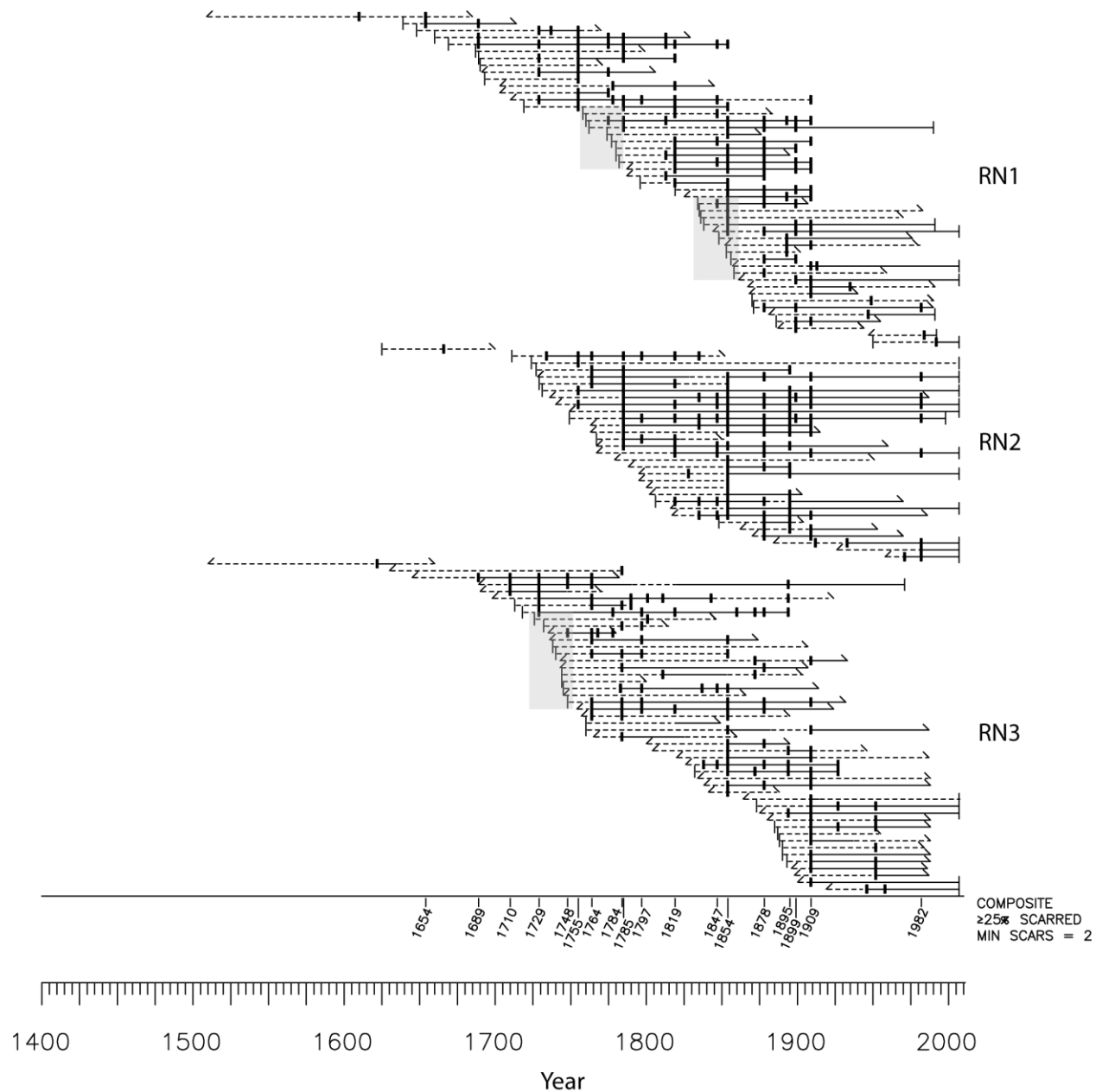


Fig. S2. Fire history graph for Rancho Nuevo: top, RN1; middle, RN2; bottom, RN3. Horizontal lines represent individual tree samples, solid horizontal lines represent periods when the sample was recording and dashed horizontal lines represent periods when the sample was not recording. Bold vertical tick marks represent precisely dated fire scar dates. Vertical lines to the left represent pith dates and slanted lines to the left represent inside ring dates (i.e. unknown number of years to pith). Grey boxes indicate 30-year periods with pulses of regeneration (≥ 8 pith dates).

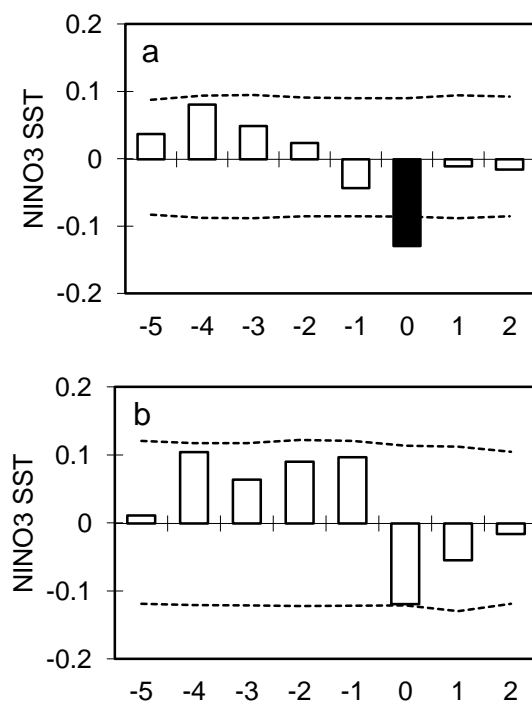


Fig. S3. Superposed epoch analysis showing departure from the mean value of NINO3 SST (sea surface temperatures; Cook 2000) for ‘widespread’ fires before 1831 (*a*) and after 1832 (*b*). Fire years are indicated by 0 on the *x*-axis and values are also given for 5 years before fire years (negative values) and 2 years after fire years. Black bars pass the 95% confidence interval. Here, NINO3 is a unitless index.

Reference

Cook ER (2000) Nino 3 Index Reconstruction. International Tree-Ring Data Bank. IGBP PAGES/World Data Center-A for Paleoclimatology Data Contribution Series #2000–052. NOAA/NGDC Paleoclimatology Program. (Boulder, CO)