Supplementary Material

Forest fire progress monitoring using dual-polarisation Synthetic Aperture Radar (SAR) images combined with multi-scale segmentation and unsupervised classification

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Supplementary Material

Supplementary Table S1. Sentinel-1 data parameters

Number	Acquisition date	Polarization mode	Orbital direction	Pixel spacing (Azimuth × Range) (m)
1	2017-11-22	VV+VH	Ascending	13.941×2.329
2	2017-11-28	VV+VH	Descending	13.941×2.329
3	2017-12-10	VV+VH	Descending	13.941×2.329
4	2017-12-16	VV+VH	Ascending	13.941×2.329
5	2018-01-15	VV+VH	Descending	13.941×2.329

**Supplementary Table S2.** Feature parameter information based on polarized SAR images construction

| Feature types	Feature names	Meaning of features
scattering intensity	BBR_{gamma}	backscatter burn ratio of the gamma value
	BBR_{sigma}	backscatter burn ratio of the sigma value
scattering mechanism	D_{alpha}	the polarization burn difference constructed using scattering angle
	$D_{entropy}$	the polarization burn difference constructed using entropy
	$D_{anisotropy}$	the polarization burn difference constructed using anisotropy
texture features	P_{mean}	texture feature change parameters calculated with mean
	$P_{variance}$	texture feature change parameters calculated with variance
	$P_{dissimilarity}$	texture feature change parameters calculated with dissimilarity
	P_{ASM}	texture feature change parameters calculated with angular second moment
	$P_{entropy}$	texture feature change parameters calculated with information entropy
	$P_{correlation}$	texture feature change parameters calculated with correlation
	$P_{homogeneity}$	texture feature change parameters calculated with homogeneity
	$P_{contrast}$	texture feature change parameters calculated with contrast
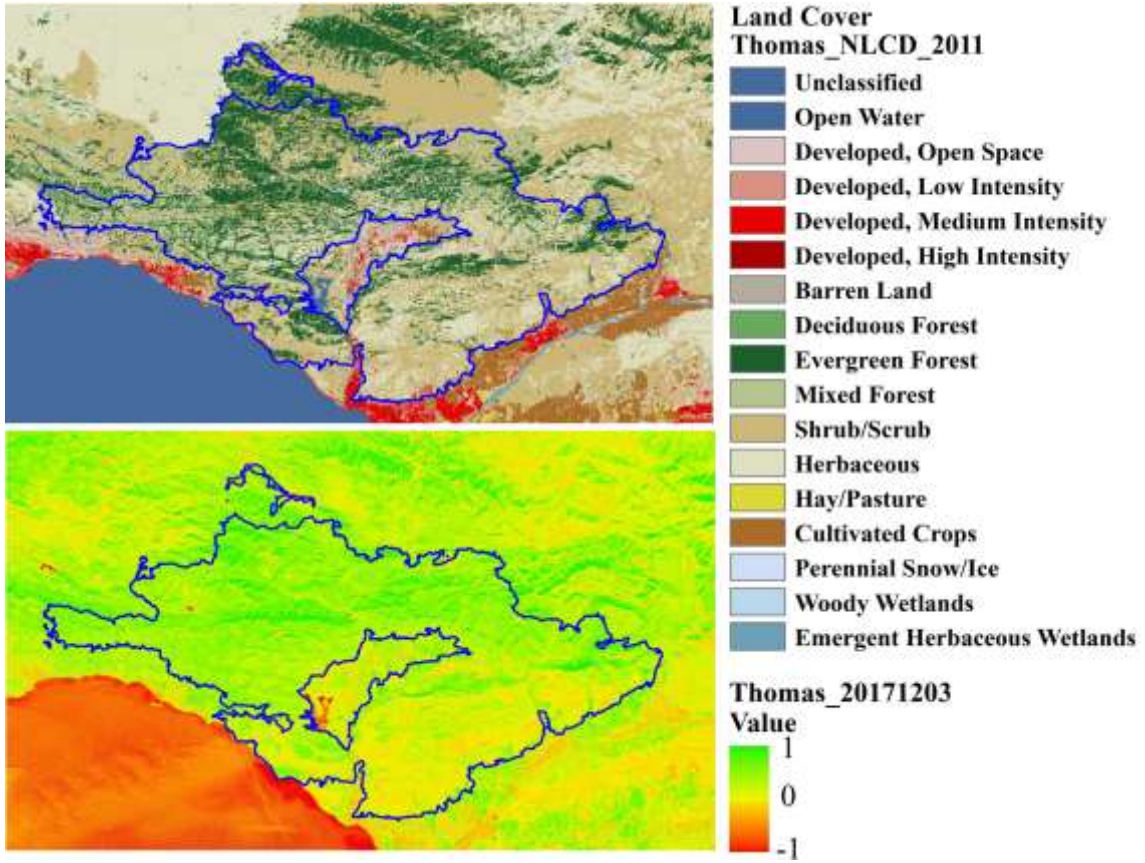
Supplementary Fig. S1. Land cover map and NDVI map on the Thomas Fire.
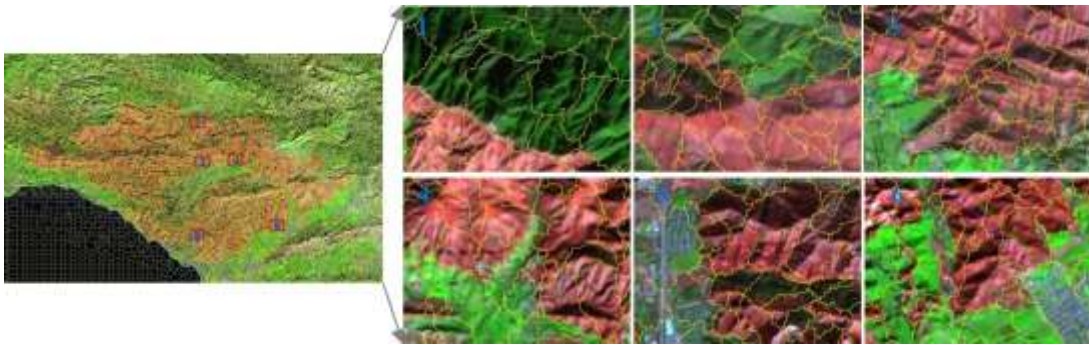
Supplementary Fig. S2. Multi-scale segmentation results
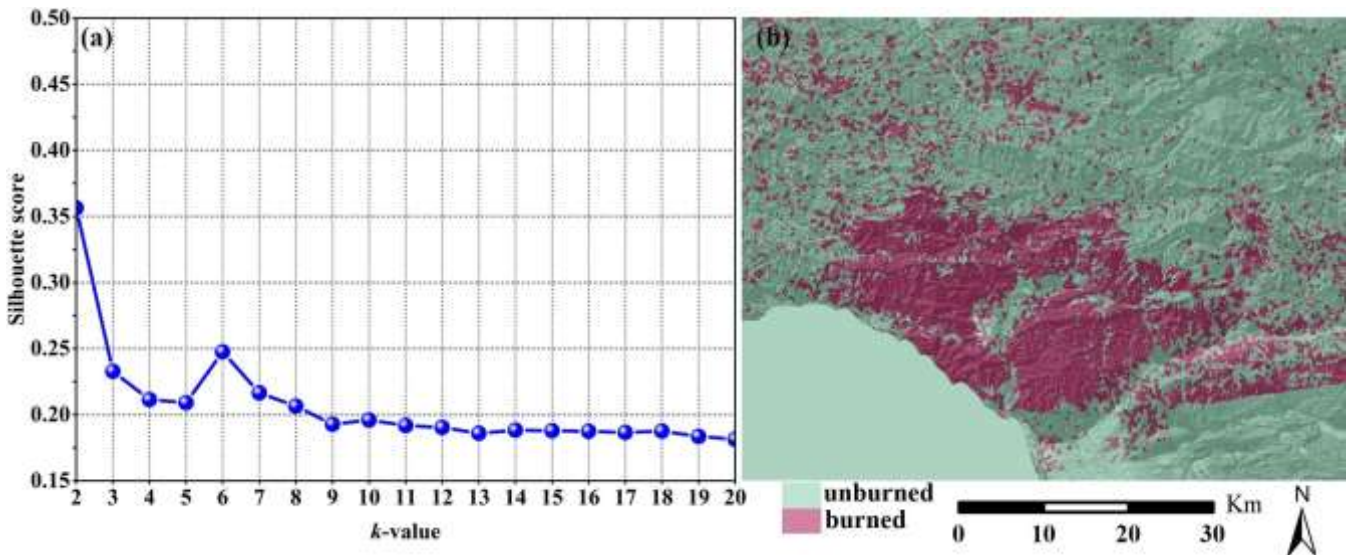
Supplementary Fig. S3. (a)Silhouette score values; (b) Map of burned area extraction results when K=2.