

Table S1. Sample plot characteristics of forest stands across three lithological soil types.

Lithology	Geographic area	Research area profile	Sample plot type	Basic characteristics
dolomite	east: 106°35'29" west: 106°33'21" south: 26°49'44" north: 26°51'37"	Located on the right bank of the Xiuwen River, Shaxi Village, Longchang Town, Xiuwen County, Guiyang City, Guizhou Province, at an elevation of 1100 m~1500 m, with an annual mean annual precipitation of 1100 mm, in a subtropical monsoon climate zone. The soil gravel content is high, and the soil layer is thin. The soil is mainly yellow lime soil and black lime soil developed from dolomite limestone. The existing vegetation includes all types of secondary high forest, trees, shrubs, and rattan bushes, with an overall vegetation coverage of 80%.	<i>Alnus cremastogyne</i>	The altitude is 1350 m, along the northwest direction, with a 25° slope. The soil is mainly yellow soil. The existing vegetation is mainly artificial pure forest, with a tree age of 15 years. The community structure is simple, including an arbour-shrub-grass layer; the arbour layer is <i>Alnus cremastogyne</i> , with a height of 5-8 m. The coverage degree is 30%.
			<i>Cupressus funebris</i>	The altitude is 1414 m, along the northeast direction, with a 40° slope. The soil is mainly rendzina. The existing vegetation is mainly artificial pure forest, with a tree age of 16 years. The community structure is simple. The arbour layer is mainly <i>Cupressus funebris</i> , with a height of 5-8 m. The coverage degree is 30%.
			<i>Coriaria nepalensis</i>	The altitude is 1283 m, along the northeast direction, with a 10° slope. The soil is mainly yellow soil. The existing vegetation is mainly secondary natural forest, with a tree age of 10 years. The community structure is simple. The shrub layer is mainly <i>Coriaria nepalensis</i> and thorny species, with a height of 1.5-3 m. The coverage degree is 60%.
			<i>Cinnamomum bodinieri</i>	The altitude is 1358 m, along the east direction, with a 25° slope. The soil is mainly yellow soil. The existing vegetation is mainly artificial pure forest, with a tree age of 16 years. The community structure is simple. The arbour layer is mainly <i>Cinnamomum bodinieri</i> , with a height of 4-8 m. The coverage degree is 80%.
			<i>Betula luminifera</i>	The altitude is 1368 m, along the northeast direction, with a 15° slope. The soil is mainly yellow brown soil. The existing vegetation is mainly secondary natural forest, with a tree age of 16 years. The community structure is complete. The arbour layer is mainly <i>Betula luminifera</i> . The coverage degree is 70%.
dolomite sandstone	east: 107°59'08" west: 107°56'48" south: 26°33'53" north: 26°34'40"	Located in Kaitang Town, Kaili City in Southeast Guizhou Province, at an elevation of 523~1233 m, with a mean annual precipitation of 1240.4 mm, in a central Asian tropical warm humid monsoon climate zone. The soil is mainly lime soil and yellow soil. The existing vegetation mainly includes natural secondary forest	<i>Platycarya longipes</i>	The altitude is 668 m, along the northeast direction, with a 38° slope. The soil is mainly limestone soil. The existing vegetation is mainly secondary natural forest, with a tree age of approximately 13 years. The community structure is simple. The shrub layer is mainly <i>Platycarya longipes</i> , with an average height of 1.8 m. The coverage degree is 55%.
				The altitude is 662 m, along the southeast direction, with a 30° slope. The soil is mainly yellow soil. The existing vegetation is mainly secondary natural forest, with a tree age of approximately 10 years. The community structure is simple and mainly includes a shrub layer. The shrub layer only contains <i>Coriaria nepalensis</i> , with an average height of 2.5-3 m. The coverage degree is 30%.

	and man-made forest, with an overall vegetation coverage of 35%.	<i>Cinnamomum bodinieri</i>	The altitude is 615 m, along the east direction, with a 38° slope. The soil is mainly yellow soil. The existing vegetation is mainly artificial pure forest, with a tree age of approximately 13 years. The community structure is simple, with an average height of 2.5-6 m. The coverage degree of the arbour layer is 30%.
		<i>Cupressus funebris</i>	The altitude is 626 m, along the south direction, with a 30° slope. The soil is mainly lime soil. The existing vegetation is mainly artificial pure forest, with a tree age of approximately 38 years. The community structure is complete, in which the arbour layer is the most developed, with an average height of 5-8 m and a coverage degree of 75%.
		<i>Coriaria nepalensis</i>	The altitude is 1230 m, along the northeast direction, with a 25° slope. The soil is mainly yellow soil. The existing vegetation is mainly secondary natural forest, with a tree age of approximately 10 years. The community structure is complete and mainly includes a shrub layer and herb layer, with an average height of 1.5-3 m. The coverage degree of the shrub layer is 45%.
	Located in Yongning Town and Puli Township, Guanling County, Anshun City, Guizhou Province, at an elevation of 800—1500 m, with a mean annual precipitation of 1430.9 mm. This area has a humid central Asian tropical monsoon climate, with four distinct seasons and a hot rainy season. The soil is mainly lime soil and yellow soil.	<i>Betula luminifera</i>	The altitude is 1404 m, along the northeast direction, with a 10° slope. The soil is mainly yellow brown soil. The existing vegetation is mainly secondary natural forest, with a tree age of 16 years. The community structure is simple and mainly includes an arbour layer of <i>Betula luminifera</i> , with a coverage degree of 40%.
east: 105°34'09"		<i>Platycarya longipes</i>	The altitude is 1581 m, along the south direction, with a 60° slope. The soil is mainly lime soil. The existing vegetation is mainly secondary natural forest, with a tree age of approximately 14 years. The community structure is simple. The shrub layer mainly includes <i>Platycarya longipes</i> , with an average height of 1.8 m and a cover degree of 30%.
west: 105°28'03"		<i>Cinnamomum bodinieri</i>	The altitude is 1432 m, along the southeast direction, with a 15° slope. The soil is mainly yellow soil. The existing vegetation is mainly artificial pure forest, with a tree age of approximately 16 years. The community structure is simple, with an average height of 2.5-5 m. The coverage degree of the arbour layer is 50%.
limestone south: 25°46'52"	The existing vegetation mainly includes natural secondary forest and man-made forest, with an overall vegetation coverage of 40%.	<i>Cupressus funebris</i>	The altitude is 1545 m, along the northeast direction, with a 45° slope. The soil is mainly rendzina. The existing vegetation is mainly artificial pure forest, with a tree age of approximately 16 years. The community structure is simple and includes a few shrubs. The average height of the arbour layer is 4-8 m, with a coverage degree of 40%.
north: 25°55'59"		<i>Alnus cremastogyne</i>	The altitude is 1468 m, along the northeast direction, with a 25° slope. The soil is mainly yellow brown soil. The existing vegetation is mainly artificial pure forest. The community structure is simple. The arbour layer mainly includes <i>Alnus cremastogyne</i> , with an average height of 8-15 m and a coverage degree of 50%.

Table S2 The mean temperature in five years of sample plots across three lithological soil types.

Lithology	The mean annual temperature (°C)					Mean
	2017	2016	2015	2014	2013	
Dolomite	15.2	15.3	15.2	14.7	15.1	15.1
Dolomite sandstone	16.8	17.1	16.6	16.2	16.6	16.66
Limestone	14.8	14.9	15	14.4	14.8	14.78