

Table S1

Summary of biotic and abiotic variables used in our study. Mean and range (in parentheses)

Properties	Definition	Units	Broadleaf mixed forest	Coniferous and broadleaf mixed forest	Coniferous mixed forest
No. of plots			149	71	48
Dominant species			<i>Cyclobalanopsis glauca</i>	<i>Pinus massoniana</i>	<i>Pinus massoniana</i>
			<i>Cinnamomum camphora</i>	<i>Pinus taiwanensis</i>	<i>Cunninghamia lanceolata</i>
			<i>Liquidambar formosana</i>	<i>Cyclobalanopsis glauca</i>	<i>Pinus taiwanensis</i>
			<i>Castanea henryi</i>	<i>Cunninghamia lanceolata</i>	<i>Cryptomeria fortunei</i>
			<i>Schima superba</i>	<i>Lindera aggregata</i>	
			<i>Castanopsis sclerophylla</i>	<i>Schima superba</i>	
AWC	Aboveground wood carbon	t/ha	63.44(0.37,156.09)	45.82(0.45,162.22)	46.44(0.88,138.72)
elevation		m	780.08(30,1427)	718.04(95,1490)	688.58(6.00,1305.00)
slope		°	36.14(15,50)	33.93(13,48)	29.54(7,45)
Age	Stand age	year	28(4,60)	25(7,52)	30(5,54)
Shannon's index	Shannon index of tree species		2.02(0.99,2.57)	1.83(0.43,2.55)	1.56(0.71,2.41)
Fdis	Functional diversity		0.09(0.06,0.18)	0.10(0.03,0.13)	0.09(0.04,0.12)
PD	Phylogenetic diversity		1447.97(325.05,2217.06)	1379.24(451.87,2055.63)	1219.58(776.92,1753.35)
DBHcv	DBH variation		0.43(0.12,0.97)	0.46(0.21,0.83)	0.482(0.25,0.72)
DBH diversity	Shannon index of DBH		1.69(0.69,2.65)	1.63(0.56,2.48)	1.84(0.72,2.46)
Stand density	Stems in a plot	stem/ha	3093.60(30.00,6497.94)	2534.34(60.00,6539.94)	2341.23(180.00,5324.95)
CWM _H	CWM of height		20.74(15.93,35.07)	24.63(14.64,38.91)	28.09(19.69,40.21)
CWM _{SLA}	CWM of specific leaf area		19.57(12.35,31.80)	18.70(14.88,23.06)	17.60(13.52,21.12)
CWM _{WD}	CWM of wood density		0.53(0.41,0.69)	0.48(0.34,0.55)	0.43(0.33,0.54)
MAT	Mean annual temperature	°C/year	16.62(13.82,18.67)	16.76(14.06,18.67)	16.81(13.89,18.72)

MAP	Mean annual precipitation	mm/year	1938.78(1470.852,2476.23)	1898.53(1469.10,2489.74)	1839.29(1415.72,2361.67)
AHM	Annual heat-moisture index	mm/year	556.83(400.00,774.10)	572.80(384.90,776.00)	594.16(404.10,789.50)

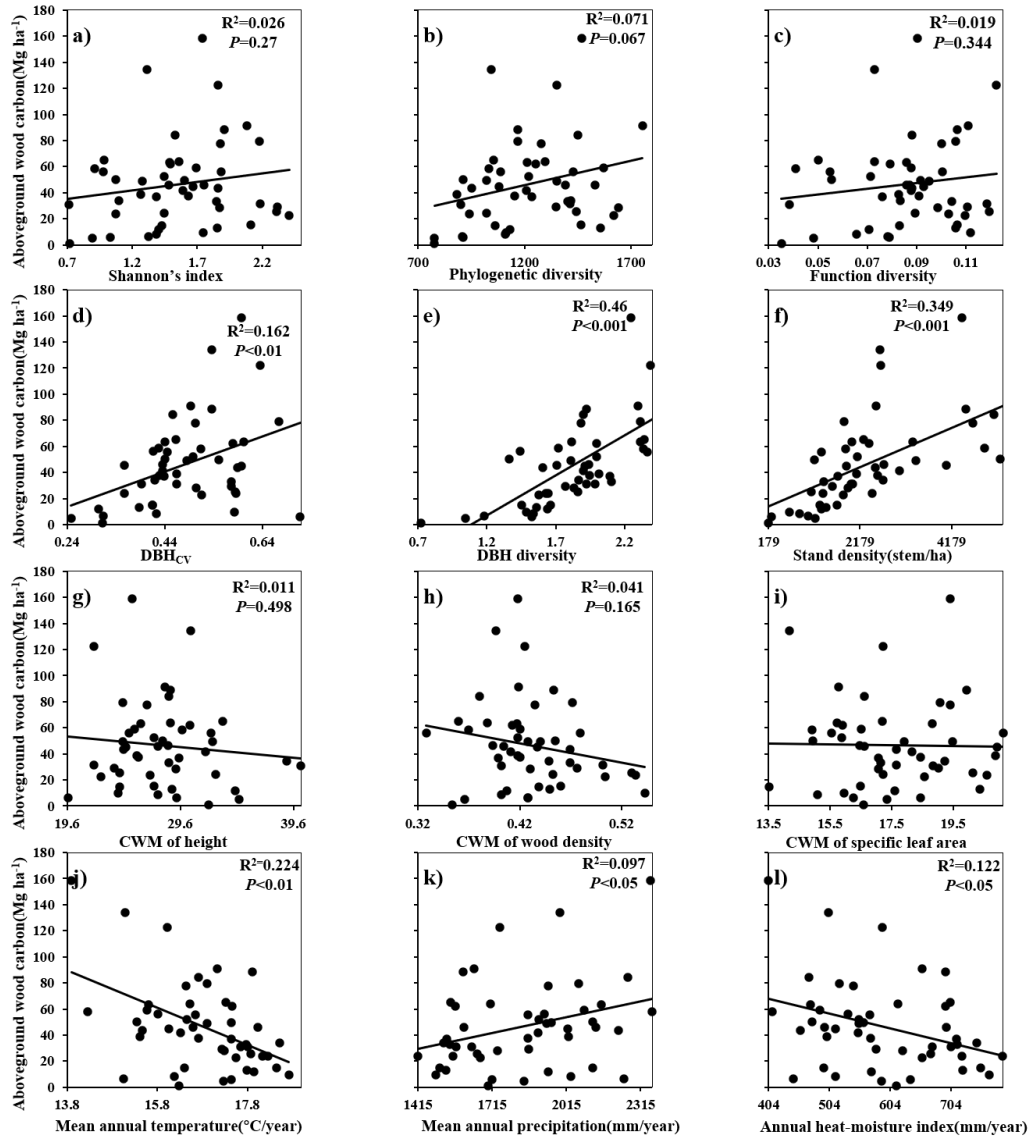


Fig. S1. Relationship between aboveground wood carbon and all variables in coniferous mixed forest (CMF).

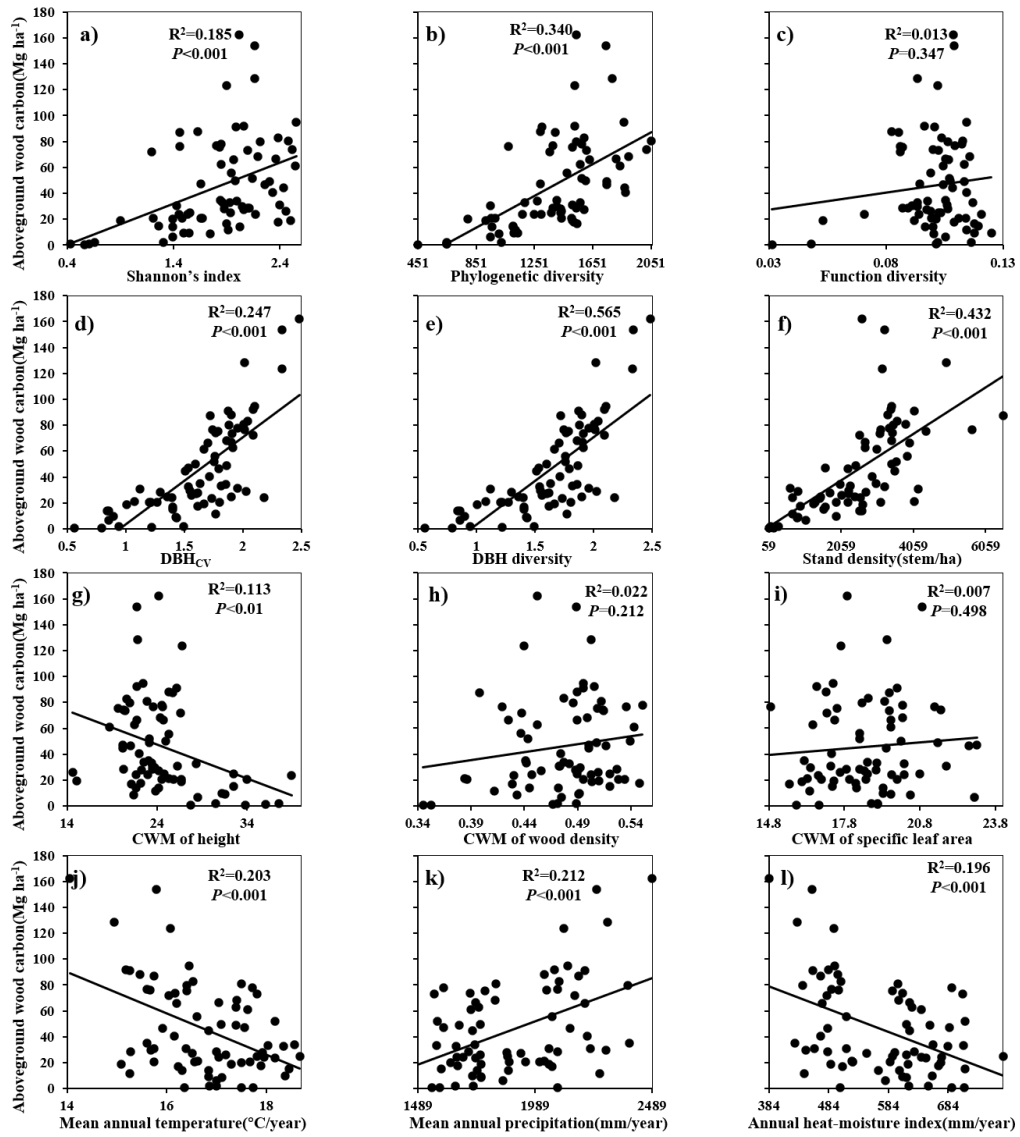


Fig. S2. Relationship between aboveground wood carbon and all variables in coniferous and broadleaf mixed forest (CBMF).

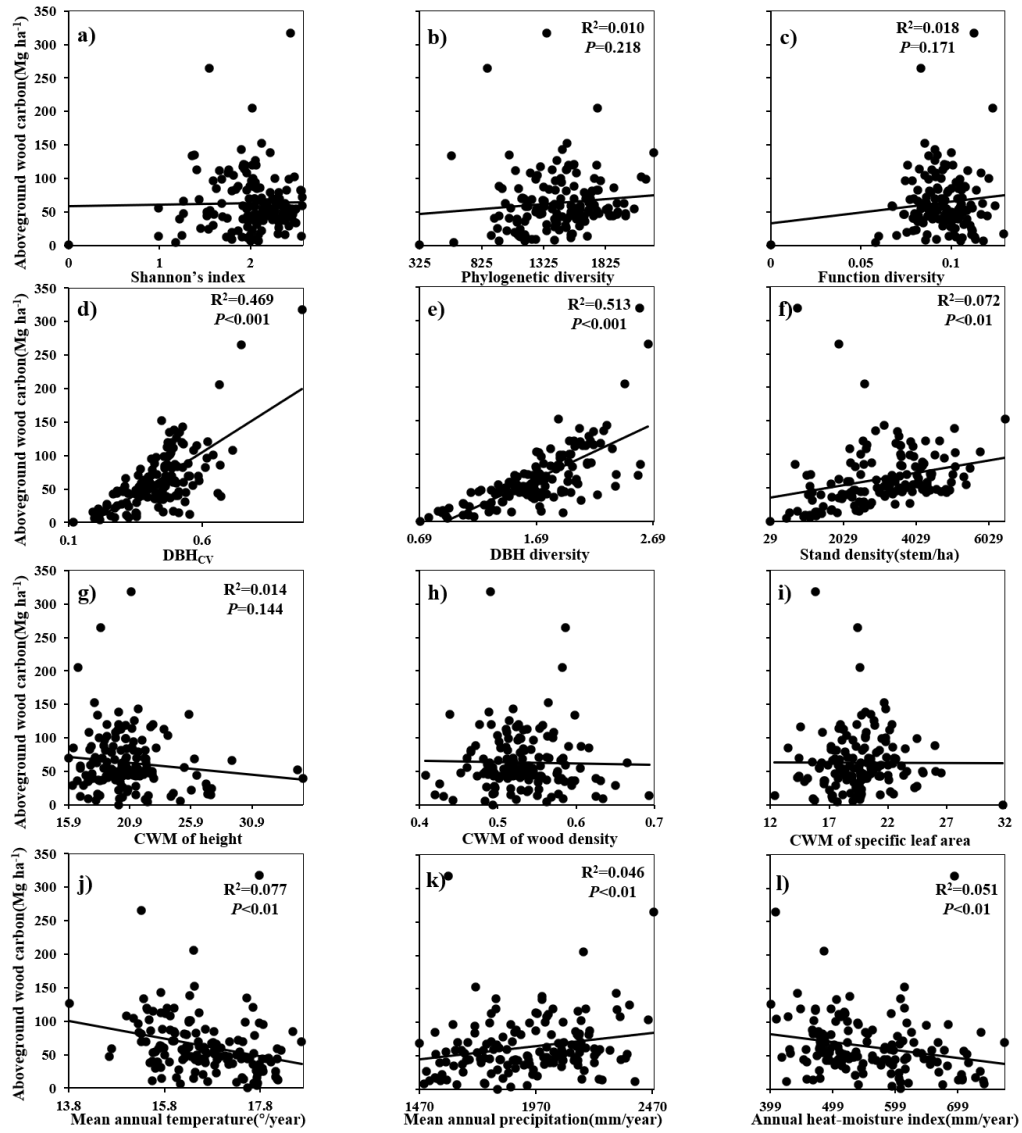
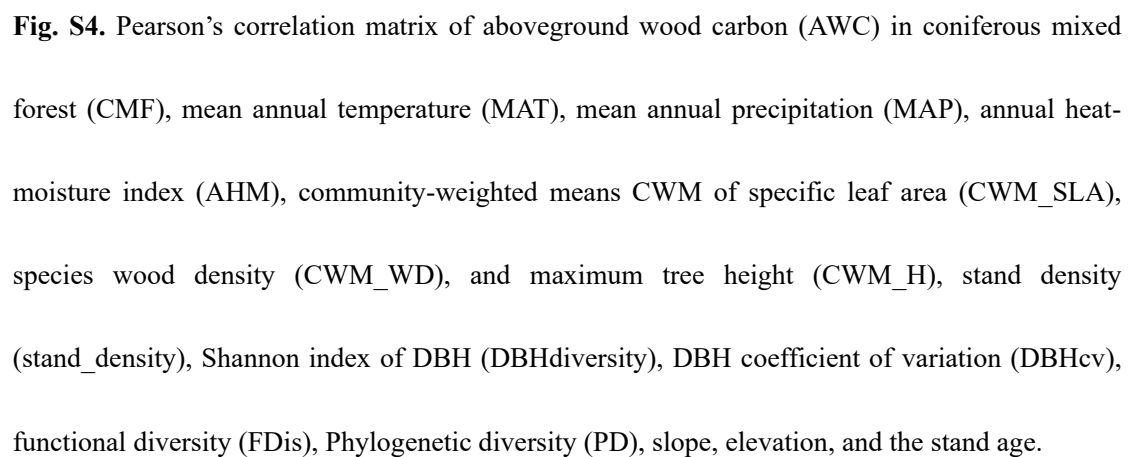


Fig. S3. Relationship between aboveground wood carbon and all variables in broadleaf mixed forest

(BMF).



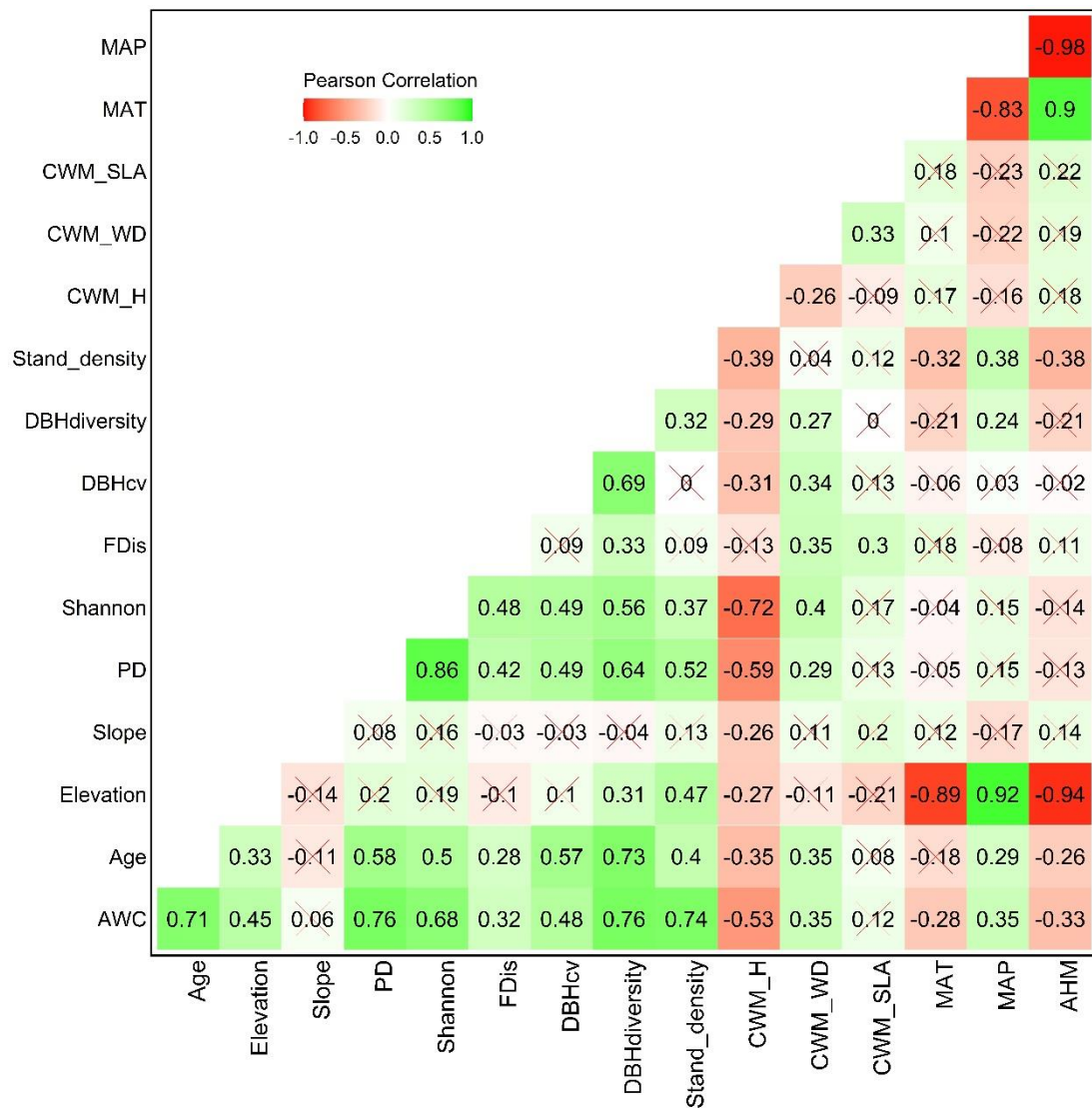


Fig. S5. Pearson's correlation matrix of aboveground wood carbon (AWC) in coniferous and broadleaf mixed forest (CBMF), mean annual temperature (MAT), mean annual precipitation (MAP), annual heat-moisture index (AHM), community-weighted means CWM of specific leaf area (CWM_SLA), species wood density (CWM_WD), and maximum tree height (CWM_H), stand density (stand_density), Shannon index of DBH (DBHdiversity), DBH coefficient of variation (DBHcv), functional diversity (FDis), Phylogenetic diversity (PD), slope, elevation, and the stand age.

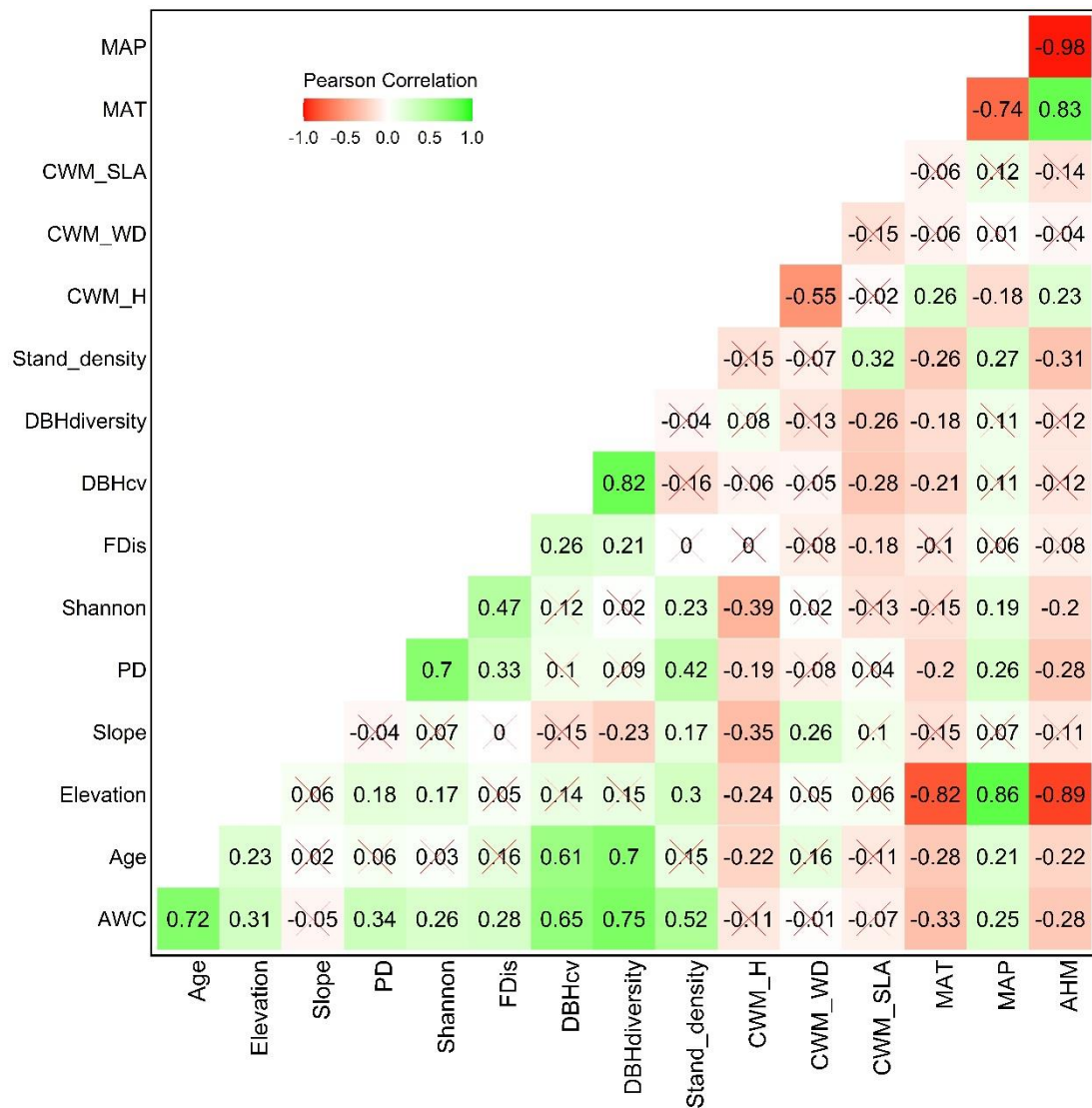


Fig. S6. Pearson's correlation matrix of aboveground wood carbon (AWC) in broadleaf mixed forest (BMF), mean annual temperature (MAT), mean annual precipitation (MAP), annual heat-moisture index (AHM), community-weighted means CWM of specific leaf area (CWM_SLA), species wood density (CWM_WD), and maximum tree height (CWM_H), stand density (stand_density), Shannon index of DBH (DBHdiversity), DBH coefficient of variation (DBHcv), functional diversity (FDis), Phylogenetic diversity (PD), slope, elevation, and the stand age.

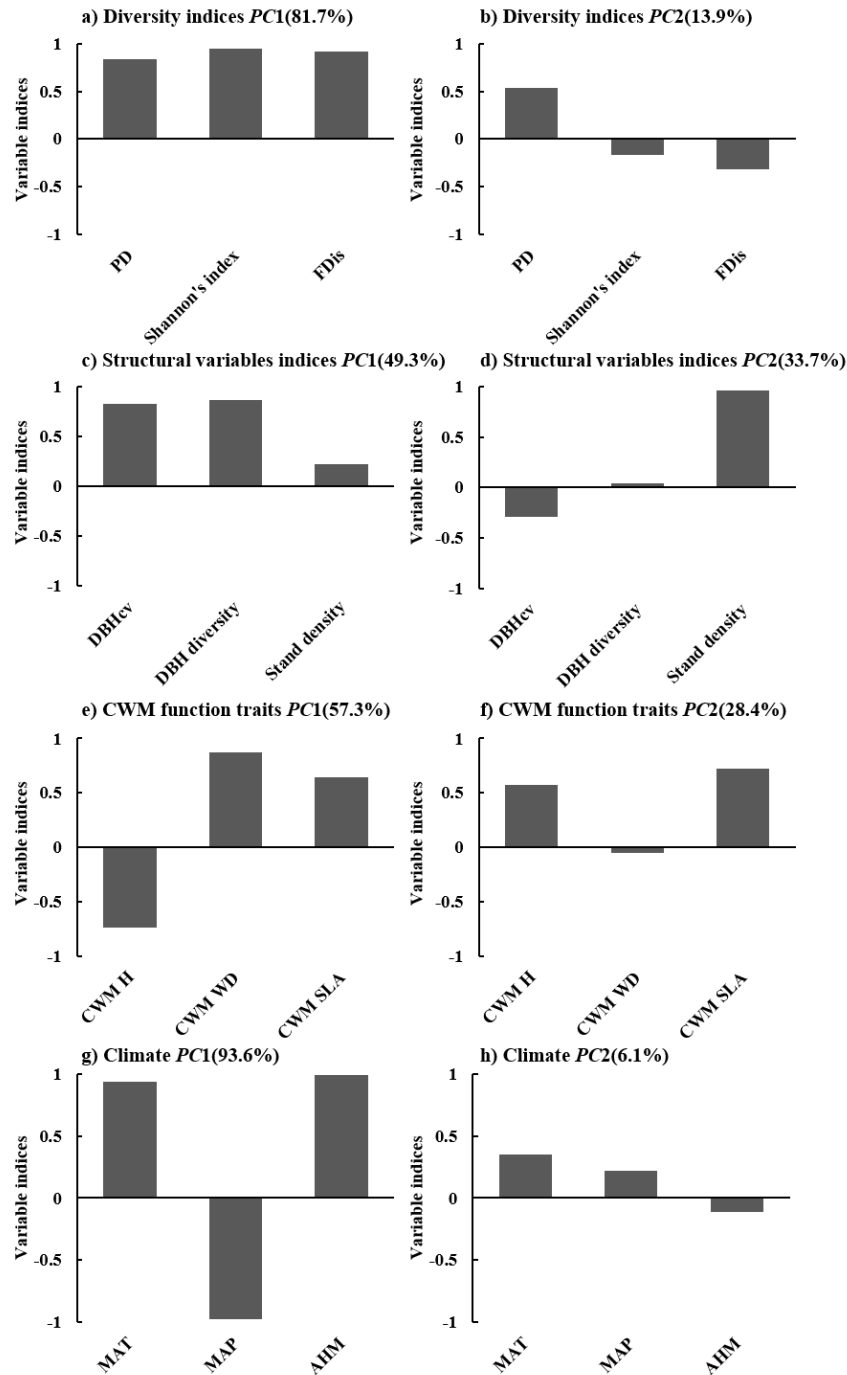


Fig. S7. Principal Component Analysis (PCA) for diversity variables, structure variables, CWM function traits and Climate variables in coniferous mixed forest (CMF). Bar plots show the loadings of different soil chemical properties and topographic variables on *PC1* and *PC2*. Values in parentheses indicate the variance (%) accounted for by each axis.

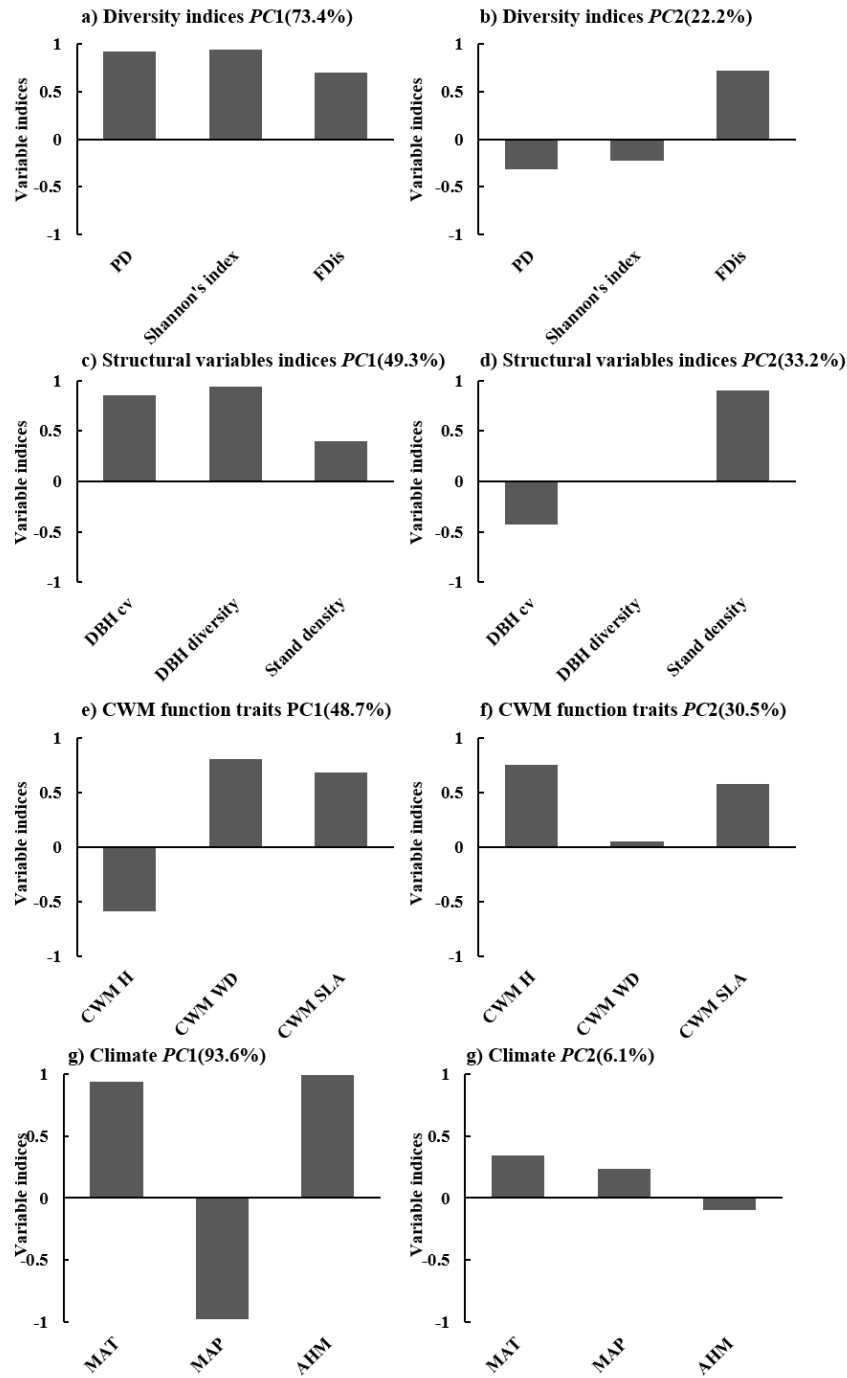


Fig. S8. Principal Component Analysis (PCA) for diversity variables, structure variables, CWM function traits and Climate variables in coniferous and broadleaf mixed forest (CBMF). Bar plots show the loadings of different soil chemical properties and topographic variables on PC1 and PC2. Values in parentheses indicate the variance (%) accounted for by each axis.

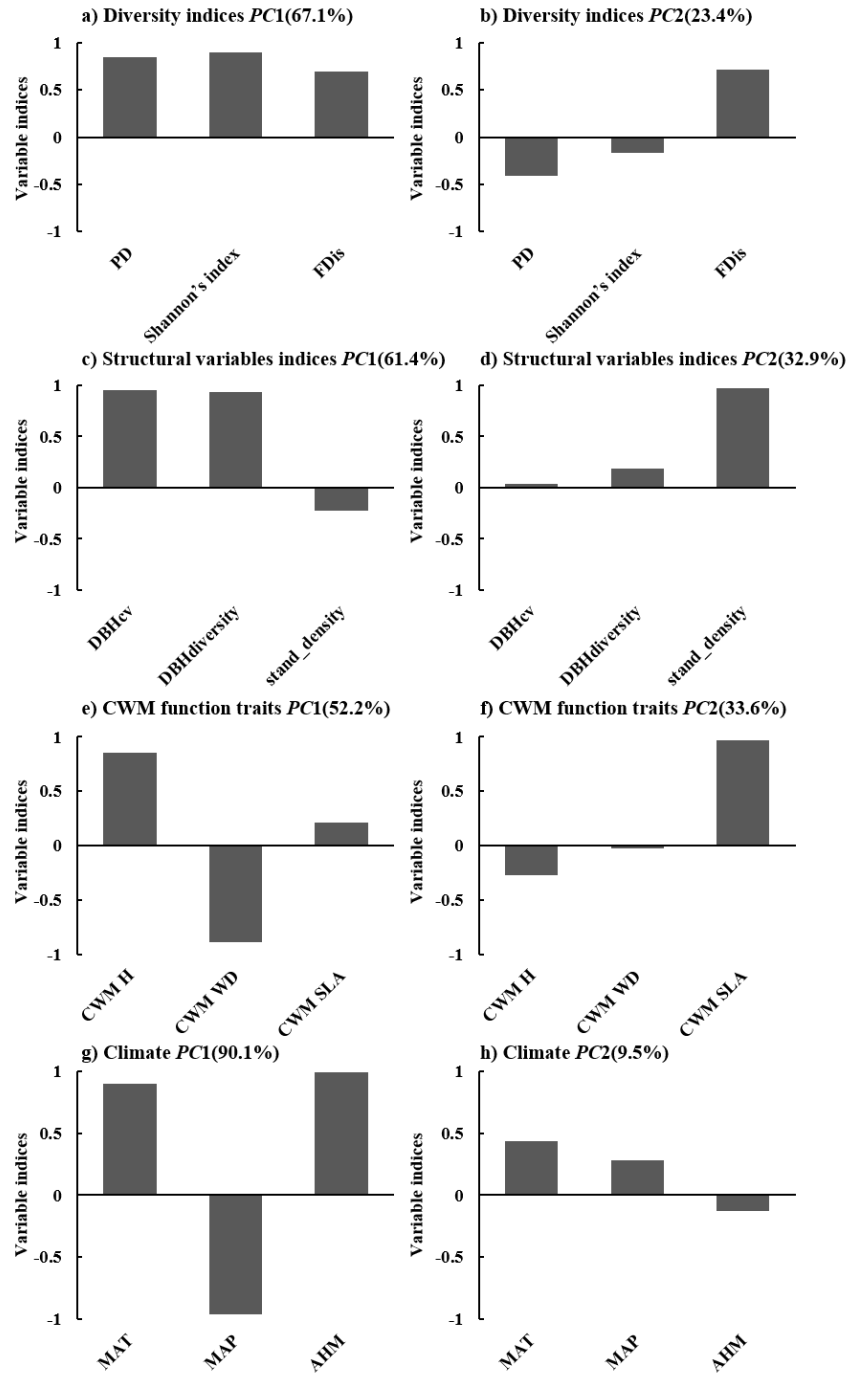


Fig. S9. Principal Component Analysis (PCA) for diversity variables, structure variables, CWM function traits and Climate variables in broadleaf mixed forest (BMF). Bar plots show the loadings of different soil chemical properties and topographic variables on PC1 and PC2. Values in parentheses indicate the variance (%) accounted for by each axis.

Table S2

The direct, indirect, and total standardized effects of climate*PCI*, Age, structure*PCI*, function*PCI*, diversity*PCI* and aboveground wood carbon based on the structural equation models (SEMs). The SEMs are presented in Fig.5. Significant effects ($P < 0.05$) are indicated in bold.

Predictor	Pathway to aboveground wood carbon	model 5a		model 5b		model 5c	
		Effect	p-value	Effect	p-value	Effect	p-value
Climate <i>PCI</i>	Direct effect	-0.174	0.017	-0.237	0.001	-0.081	0.052
	Indirect effect via Structure <i>PCI</i>	-0.073	0.342	-0.020	0.642	0.011	0.441
	Indirect effect via Structure <i>PCI</i> &Function <i>PCI</i>	-0.006	0.445	0.000	0.710	0.001	0.483
	Indirect effect via Diversity <i>PCI</i>	0.034	0.389	0.029	0.407	-0.047	0.019
	Indirect effect via Diversity <i>PCI</i> &Function <i>PCI</i>	-0.019	0.398	0.007	0.451	0.002	0.268
	Indirect effect via Function <i>PCI</i>	-	-	0.025	0.216	-	-
	Total effect	-0.238	0.256	-0.197	0.052	-0.114	0.017
Age	Direct effect	-0.022	0.834	0.151	0.149	0.425	<0.001
	Indirect effect via Structure <i>PCI</i>	0.521	<0.001	0.395	<0.001	0.153	<0.001
	Indirect effect via Structure <i>PCI</i> &Function <i>PCI</i>	0.040	0.215	0.009	0.540	0.016	0.119
	Indirect effect via Diversity <i>PCI</i>	0.093	0.062	0.189	0.004	0.009	0.628
	Indirect effect via Diversity <i>PCI</i> &Function <i>PCI</i>	-0.053	0.084	0.043	0.127	0.000	0.651
	Indirect effect via Function <i>PCI</i>	-0.095	0.073	-	-	-0.032	0.092
	Total effect	0.483	0.002	0.787	<0.001	0.570	<0.001
Structure <i>PCI</i>	Direct effect	0.744	<0.001	0.534	<0.001	0.228	<0.001
	Indirect effect via Function <i>PCI</i>	0.058	0.207	0.012	0.539	0.024	0.115

Diversity <i>PCI</i>	Total effect	0.802	<0.001	0.546	<0.001	0.252	<0.001
	Direct effect	0.281	0.004	0.334	0.001	0.221	<0.001
	Indirect effect via Function <i>PCI</i>	-0.160	0.015	0.075	0.112	-0.010	0.221
Function <i>PCI</i>	Total effect	0.121	0.146	0.409	<0.001	0.211	<0.001
	Direct effect	-0.270	0.006	0.144	0.087	0.078	0.064
	Indirect	-	-	-	-	-	-
	Total effect	-0.270	0.006	0.144	0.087	0.078	0.064
