Table S1. The mean annual nitrous oxide (N_2O) fluxes, the number of samples (N), area, and total N_2O emission of different leaf habit, leaf trait and total global forests. The corresponding area data were estimated according to the study of Li et al. [16].

Type		Mean annual N_2O flux (mg N m^{-2} yr^{-1})	N	Area (M ha)	Total emission (Tg N)
Leaf habit	Evergreen forests	137.63	132	2071.1	2.85
	Deciduous forests	154.74	59	1053.5	1.63
Leaf trait	Coniferous forests	98.57	84	1052.3	1.04
	Broadleaved forests	176.99	109	2062.3	3.65
Global		142.91	191	3114.6	4.45

Table S2. The coefficient of determination (R^2) of relationships between N_2O fluxes and edaphic factors (soil temperature (ST), WFPS, NH4 (NH_4^+ concentration), NO3 (NO_3^- concentration) and DOC (DOC concentration)) for each forest site.

ID	ST	WFPS	NH4	NO3	DOC
1	0.403269	0.011492	0.316179	0.036216	
2	0.278032	0.062484	0.012129	0.000199	
3	0.389241	0.206286			
8	0.675001	0.054277			
30			0.065479		
32	0.070704				
33	0.161436				
34	0.238762	0.032189			
36	0.553973	0.867606			
37					0.064171
40	0.065112		0.000216	0.000211	
41		0.53416	0.131814	0.212188	
44			0.120591	0.187932	
45		0.238509			
46		0.052211			
52	0.76454	0.599597			
53	0.691379	0.456464			
54	0.245038				
55	0.077772	0.06896	0.455783	0.706647	0.567805
56	0.062508		0.373812	0.023362	0.078782
57	0.062462		0.010298	0.137545	0.025244
58	0.24356				
61	0.33238				
62	0.185243				
63	0.531352				
64	0.531828				
65		0.559751			
70	0.047423	0.014501			
84	0.326434	0.414863			

91	0.803478		0.001669		
92	0.688717		0.24218		
93	0.092866		0.875279		
98		0.051625			
102	0.513045		0.001205	0.021547	
103		0.016785			
104		0.106147			
105		0.038934			
106		0.115292			
107		0.034373			
108		0.039167			
110	0.022438	0.298346			
111	0.022083	0.133863			
112	0.11238		0.248286	0.060821	
114	0.543071	0.268479			
115	0.611168	0.356961			
119	0.270481		0.50336	0.05698	
120	0.421065		0.128412	0.04663	
123		0.864513			
124	0.477365				
125	0.49282				
126	0.688957				
127	0.630508	0.150381			0.143149
128	0.347567				
129	0.873529				
131	0.522409				
132	0.724443				
133			0.042023	0.018092	
135	0.074425				
146	0.104332	0.098314			
149	0.746306				
150		0.294469			
170	0.628635				
171	0.564589				
172	0.093324				
186	0.060841				
187	0.18917				
188	0.244116	0.228398	0.191489		
189	0.289536	0.019067	0.079685	0.035823	
190	0.398619	0.220556	0.004304	0.205887	

Table S3. The clay fraction (Clay), sand fraction (Sand), mean annual temperature (MAT), mean annual precipitation (MAP), pH, dissolved organic carbon content (DOC, %), water filled pore space (WFPS), soil temperature (ST, ℃), ammonium concentration (NH_4^+, mg/kg) and nitrate concentration (NO_3^-, mg/kg) for different classification groups (mean ± standard deviation (count)).

Factors	**Global**	**LT**		**LH**	
		CF	**BF**	**EF**	**DF**
Clay (%)	20.77±14.59(191)	18.43±14.75(83)	22.58±14.27(108)	21.19±15.80(132)	19.84±11.50(59)
Sand (%)	43.95±22.70(191)	44.85±24.89(83)	43.26±20.96(108)	44.52±23.50(132)	42.68±21.04(59)

MAT (℃)	10.13±9.88(191)	6.27±6.06(83)	13.10±11.17(108)	12.02±9.40(132)	5.90±9.70(59)
MAP (mm)	1634.87±1187.67(191)	1392.81±966.57(83)	1820.90±1307.05(108)	1891.06±1276.98(132)	1061.80±673.87(59)
pH	4.84±1.15(191)	4.60±1.07(83)	5.02±1.18(108)	4.79±1.18(132)	4.95±1.08(59)
DOC(%)	11.61±14.45(61)	12.82±15.12(22)	10.92±14.21(39)	12.41±14.70(41)	9.97±14.14(20)
WFPS	54.44±16.99(39)	55.60±14.73(17)	53.54±18.84(22)	58.33±16.19(25)	47.51±16.71(14)
ST(℃)	13.33±5.75(82)	10.34±3.24(33)	15.34±6.21(49)	13.82±5.56(54)	12.38±6.11(28)
NH_4^+ (mg N kg^{-1})	16.15±16.48(47)	21.48±20.48(16)	13.41±13.55(31)	18.40±17.53(35)	9.59±11.07(12)
NO_3^- (mg N kg^{-1})	9.92±15.44(51)	4.47±5.75(15)	12.20±17.58(36)	10.83±16.10(39)	6.98±13.26(12)

LT: leaf trait; LH: leaf habit; CF: coniferous forests; BF: broadleaved forests; EF: evergreen forests; DF: deciduous forests;.