Supplement of Biogeosciences Discuss., 12, 11191–11216, 2015
http://www.biogeosciences-discuss.net/12/11191/2015/
doi:10.5194/bgd-12-11191-2015-supplement

Biogeosciences
Discussions
Open Access

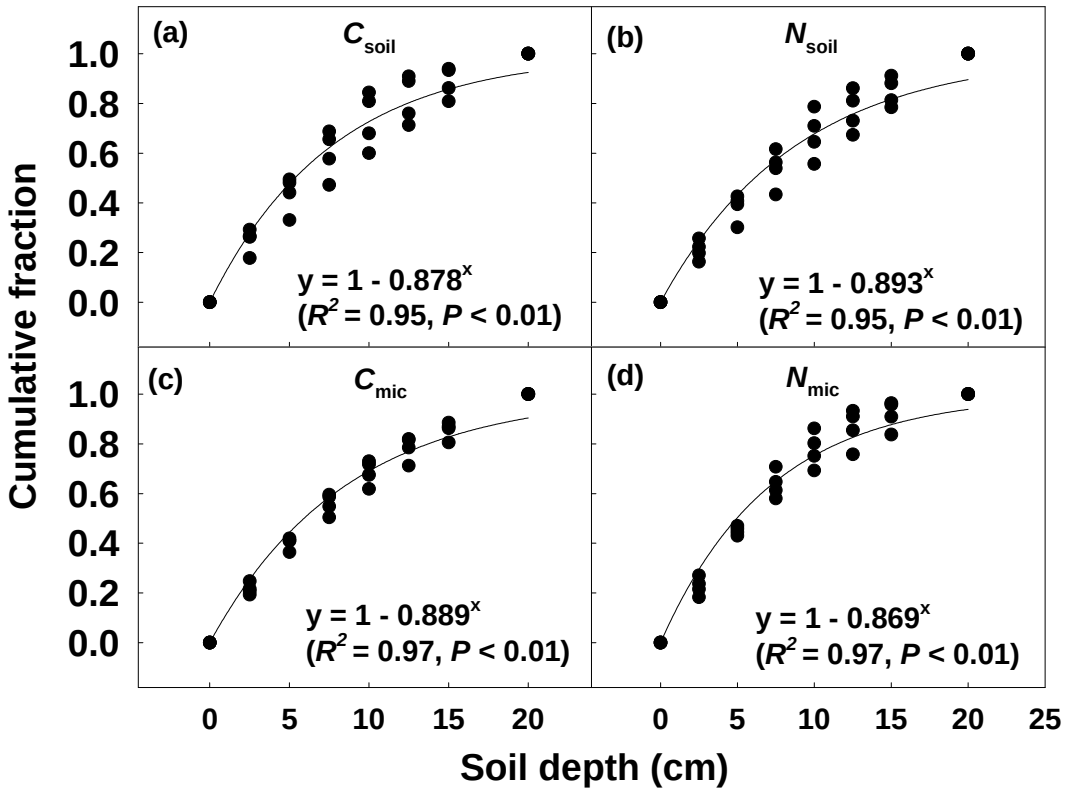
Supplement of

Soil resources and climate jointly drive variations in microbial biomass carbon and nitrogen in China's forest ecosystems

Z. H. Zhou and C. K. Wang

Correspondence to: C. K. Wang (wangck-cf@nefu.edu.cn)

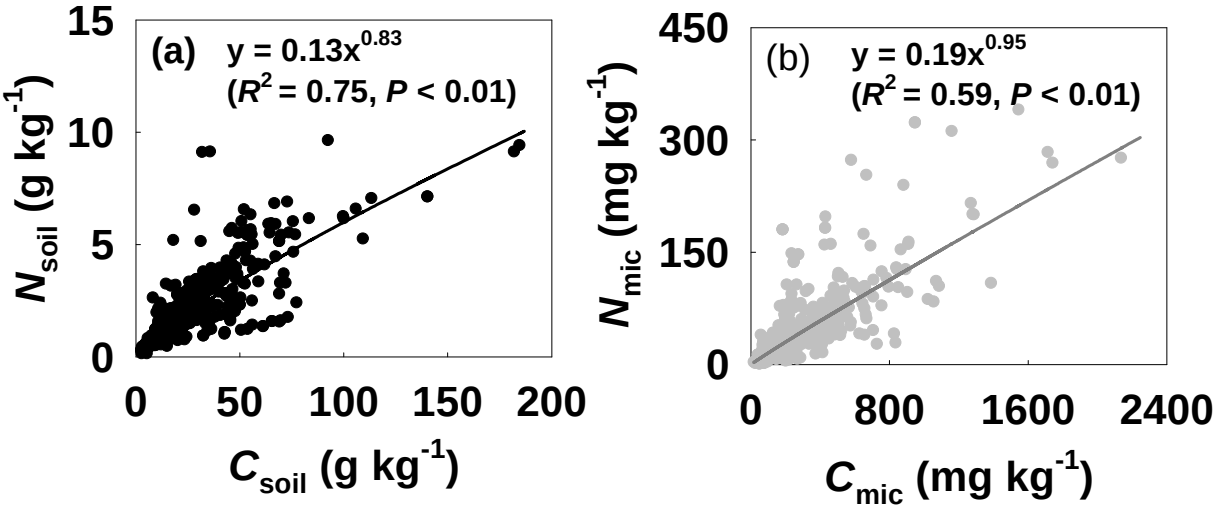
Figure S1. Cumulative fraction of soil organic carbon (C_{soil}), soil total nitrogen (N_{soil}), soil microbial carbon (C_{mic}), or soil microbial biomass nitrogen (N_{mic}) from the soil surface to the 20 cm depth.



The regressions are derived from Xu *et al.* (2011) and of the form: $y = 1 - b^x$, where b is the regression coefficient, x is the soil depth, and y is the cumulative fraction of C_{soil}, N_{soil}, C_{mic}, or N_{mic} from the soil surface to depth x. All the equations are highly significant ($P < 0.001$).

Xu, X.K., Miao, H.Y. and Chen, Z.: The vertical distribution and their relationship of dissolved organic carbon and exchangeable metals in Chinese old-growth forest soils, African J. Agric. Res., 6, 998-1008, 2011.

Figure S2. Relationships between carbon and nitrogen for soil and microbial biomass



C_{soil}, N_{soil}, C_{mic}, and N_{mic} stand for soil organic carbon, soil total nitrogen, microbial biomass carbon, and microbial biomass nitrogen, respectively.

Table S1. Data set used in this study (0 – 20 cm).

CZ	MR	Lat.	MAT	MAP	C_{soil}	N_{soil}	C_{mic}	N_{mic}	C_{soil}:N_{soil}	C_{mic}:N_{mic}	C_{mic}/C_{soil}	N_{mic}/N_{soil}	Ref.
HF	PF	31.7	11.0	494.8	11.4	2.1	391.5		5.4		3.4		86
	PF	31.7	11.0	494.8	16.6	1.3	393.3		13.0		2.4		
	PF	31.7	11.0	494.8	29.2	3.5	686.5		8.4		2.4		
	NF	31.7	11.0	494.8	19.9	2.8	760.0		7.2		3.8		
	NF	31.7	11.0	494.8	23.1	2.3	555.7		10.0		2.4		
	NF	31.7	11.0	494.8	65.0	5.9	842.5		10.9		1.3		
	PF	31.7	8.9	900.0	32.2		549.8				1.7		135
	NF	31.7	8.9	900.0	40.6		653.8				1.6		
	NF	29.8	3.8	1949.0	56.3	3.9	767.2		14.4		1.4		138
	PF	29.8	3.8	1949.0	11.1	0.6	244.2		18.4		2.2		
	PF	29.8	3.8	1949.0	11.7	0.6	335.3		19.1		2.9		
	PF	31.6	9.0	850.0	30.1		331.3				1.1		169
	NF	31.8	9.0	850.0	27.4		265.3						154
	NF	31.8	9.0	850.0	53.2		349.6						
	NF	31.8	9.0	850.0	79.4		694.6						
	NF	29.6	9.8	1134.0	65.5	1.6	428.3	182.7	41.2	2.3	0.7	11.5	90
	NF	29.6	9.8	1134.0	61.1	1.4	273.8	147.1	45.0	1.9	0.4	10.8	
	NF	29.6	9.8	1134.0	42.7	1.1	241.9	77.3	38.9	3.1	0.6	7.0	
	NF	29.6	9.8	1134.0	32.3	0.9	233.5	85.4	34.3	2.7	0.7	9.1	
	NF	31.0	8.4	861.8	32.7	2.7	79.4	22.5	12.2	3.5	0.2	0.8	35
	NF	30.9	8.4	861.8	48.8	3.7	126.6	35.9	13.2	3.5	0.3	1.0	
	NF	30.9	8.4	861.8	45.8	3.8	112.7	36.3	12.1	3.1	0.2	1.0	
	NF	31.3	3.0	850.0	99.9	6.2		7.4	16.2			0.1	163
	PF	31.3	3.0	850.0	109.1	5.3		8.3	20.7			0.2	
	NF	31.3	3.0	850.0	99.6	6.3		12.3	15.9			0.2	
	NF	31.5	8.1	750.0	33.3		577.7				1.7		95
	NF	31.5	8.1	750.0	47.3		1543.6				3.3		

NF	31.5	5.5	750.0	54.6		2070.7				3.8	
NF	31.5	5.5	750.0	63.9		2247.5				3.5	
NF	31.5	4.3	750.0	77.2		432.4				0.6	
NF	31.5	4.3	750.0	86.7		871.2				1.0	
NF	31.5	4.0	750.0	85.1		1145.8				1.3	
NF	31.5	4.0	750.0	84.3		1534.1				1.8	
NF	31.5	3.7	750.0	50.6		808.1				1.6	
NF	31.6	8.0	850.0	64.8		608.2				0.9	47
PF	31.6	8.0	850.0	33.3		389.6				1.2	
PF	31.8	8.0	850.0	49.1		482.3				1.0	
PF	31.8	8.0	850.0	69.3		653.0				0.9	
PF	31.8	9.0	850.0	47.2	2.5	475.1		19.1		1.0	140
PF	31.8	9.0	850.0	52.5	4.7	493.0		11.2		0.9	
NF	31.8	9.0	850.0	140.2	7.1	614.9		19.6		0.4	
NF	31.7	8.6	919.5	25.8	1.7	325.0		15.3		1.3	67
NF	31.7	8.6	919.5	16.5	1.6	368.6		10.5		2.2	
PF	31.7	8.6	919.5	26.1	2.7	329.3		9.6		1.3	
PF	31.7	8.6	919.5	24.4	2.6	352.2		9.4		1.4	
PF	31.7	8.6	919.5	19.2	1.2	353.3		15.8		1.8	
PF	31.7	8.6	919.5	26.4	2.8	308.4		9.5		1.2	
PF	31.7	8.6	919.5	16.7	1.9	331.9		8.7		2.0	
PF	31.7	8.6	919.5	18.9	1.6	372.0		11.6		2.0	
PF	31.7	8.6	919.5	17.0	1.4	416.0		12.3		2.5	
PF	31.7	8.6	919.5	15.3	2.0	337.2		7.7		2.2	
PF	31.7	8.6	919.5	24.5	2.9	407.7		8.5		1.7	
PF	30.0	16.1	1772.2	23.1		409.4	26.7		15.3	1.8	137
PF	30.0	16.1	1772.2	30.1		406.8	36.1		11.3	1.4	
PF	30.0	16.1	1772.2	41.2		520.3	44.8		11.6	1.3	
PF	30.1	9.0	850.0	13.4		305.1				2.3	55
PF	30.1	9.0	850.0	12.3		236.4				1.9	

PF	30.1	9.0	850.0	7.8		201.5				2.6		
PF	30.1	9.0	850.0	7.3		188.4				2.6		
NF	31.3	1.6	850.0	29.2	1.6	199.5	22.2	17.9	9.0	0.7	1.4	108
PF	30.2	16.0	1250.2	62.3		104.3				0.2		89
PF	31.8	9.0	850.0	47.2	2.5	448.5		19.1		1.0		185
PF	31.8	9.0	850.0	52.5	4.7	520.9		11.2		1.0		
NF	31.8	9.0	850.0	140.2	7.1	463.0		19.6		0.3		
PF	31.8	12.0	584.0	33.2	3.5	585.1	108.9	9.5	5.4	1.8	3.1	127
PF	31.8	12.0	584.0	31.6	3.5	483.7	91.4	9.1	5.3	1.5	2.6	
PF	31.8	12.0	584.0	29.0	3.0	426.0	70.4	9.7	6.1	1.5	2.4	
PF	31.8	12.0	584.0	30.4	3.4	604.6	103.7	8.9	5.8	2.0	3.0	
PF	31.8	12.0	584.0	28.3	3.0	520.1	82.0	9.5	6.3	1.8	2.8	
PF	31.8	12.0	584.0	30.4	3.3	535.0	89.3	9.2	6.0	1.8	2.7	
PF	31.7	9.3	825.2	26.5	2.4	286.2	82.1	10.9	3.5	1.1	3.4	49
PF	31.7	9.3	825.2	36.6	3.2	509.0	76.7	11.5	6.6	1.4	2.4	
PF	31.7	8.9	900.0	29.2	3.5	705.7	90.9	8.4	7.8	2.4	2.6	85
PF	31.7	8.9	900.0	11.4	2.1	393.0	52.5	5.4	7.5	3.5	2.5	
NF	31.7	8.9	900.0	19.9	2.8	650.0	174.7	7.2	3.7	3.3	6.3	
PF	31.7	8.9	900.0	16.6	1.3	360.7	77.2	13.0	4.7	2.2	6.0	
NF	31.5	11.0	500.0	37.7		287.9				0.8		133
NF	31.5	11.0	500.0	35.9		267.1				0.7		
PF	31.5	11.0	500.0	28.7		242.0				0.8		
PF	31.5	11.0	500.0	29.5		250.1				0.8		
PF	31.5	11.0	500.0	27.6		248.7				0.9		
PF	31.5	11.0	500.0	21.1		186.1				0.9		
PF	30.0	16.7	1233.0	13.3		223.6				1.7		27
PF	30.0	16.7	1233.0	12.1		179.1				1.5		
PF	30.0	16.7	1233.0	10.4		140.3				1.3		
PF	31.8	8.0	850.0	47.2		476.2				1.0		199
PF	31.8	8.0	850.0	52.5		490.3				0.9		

	NF	31.8	8.0	850.0	140.2		611.1				0.4			
	NF	29.6	-0.7	1134.0	65.5	1.6	428.4	182.7	41.2	2.3	0.7	11.5	201	
	NF	29.6	-0.7	1134.0	61.1	1.4	273.8	147.1	44.9	1.9	0.4	10.8		
	NF	29.6	-0.7	1134.0	42.7	1.1	241.9	77.3	38.8	3.1	0.6	7.0		
	NF	29.6	-0.7	1134.0	32.3	0.9	233.5	85.4	34.4	2.7	0.7	9.1		
	NF	29.6	-0.7	1134.0	22.4	0.8	15.9	3.4	27.2	4.6	0.1	0.4	91	
	NF	29.6	-0.7	1134.0	42.5	1.0	71.8	4.6	41.6	15.6	0.2	0.5		
	NF	29.7	-0.7	1134.0	69.0	1.6	166.0	51.0	44.1	3.3	0.2	3.3		
	NF	29.6	-0.7	1134.0	50.6	1.2	85.4	22.2	42.3	3.8	0.2	1.9		
	NF	29.6	-0.7	1134.0	53.6	1.2	97.9	24.4	43.2	4.0	0.2	2.0		
	NF	29.6	-0.7	1134.0	55.9	1.4	127.3	42.5	39.3	3.0	0.2	3.0		
	NF	29.6	-0.7	1134.0	69.6	1.6	299.9	51.7	42.8	5.8	0.4	3.2		
	NF	29.6	-0.7	1134.0	73.0	1.8	312.0	73.2	41.1	4.3	0.4	4.1		
	NF	29.6	-0.7	1134.0	77.2	2.4	424.0	160.0	32.0	2.6	0.5	6.6		
	NF	31.7	8.9	919.5	52.4	3.3	752.8	78.9	16.1	9.5	1.4	2.4	8	
CT	NF	47.6	1.9	555.0	45.8		760.7				1.7		172	
	PF	42.5	-1.4	450.0	4.8	0.6	74.7	2.1	8.3	35.0	1.6	0.4	184	
	PF	42.5	-1.4	450.0	8.3	0.8	71.5	2.5	9.8	28.4	0.9	0.3		
	PF	42.5	-1.4	450.0	7.3	0.6	48.6	1.2	11.4	41.3	0.7	0.2		
	PF	42.5	-1.4	450.0	6.3	0.6	24.5	1.8	9.7	13.7	0.4	0.3		
	PF	42.5	-1.4	450.0	6.3	0.6	47.8	1.4	9.8	34.3	0.8	0.2		
	PF	42.5	-1.4	450.0	12.1	1.2	59.1	1.9	9.7	31.8	0.5	0.2		
	PF	42.5	-1.4	450.0	16.5	1.7	96.2	3.8	9.5	25.1	0.6	0.2		
	NF	42.5	-1.4	450.0	13.4	1.4	78.2	2.2	9.8	35.2	0.6	0.2		
	NF	42.5	-1.4	450.0	8.0	0.9	75.4	4.9	8.7	15.3	0.9	0.5		
	NF	48.6	1.9	575.0	50.0	2.3	1658.0		21.5		3.3		37	
	NF	42.5	1.2	920.0	40.5	4.0	637.4		10.2		1.6		20	
	PF	42.5	1.2	920.0	30.2	3.0	431.6		10.0		1.4			
	PF	42.8	6.4	450.0	2.7	0.2	81.8		17.1		3.0		170	
	NF	47.6	1.9	575.0	50.0	2.3	705.8		21.5		1.4		179	

PF	45.4	2.8	723.0	69.8	5.4	661.0	97.5	12.8	6.8	0.9	1.8	34
NF	41.9	4.7	775.0	35.9	3.6	476.9	75.1	9.9	6.4	1.3	2.1	157
PF	41.9	4.7	775.0	23.1	2.3	303.3	41.9	9.9	7.2	1.3	1.8	
NF	41.9	4.7	775.0	39.1	3.3	515.3	39.5	11.9	13.0	1.3	1.2	158
PF	41.9	4.7	775.0	29.7	2.8	348.6	28.5	10.7	12.2	1.2	1.0	
NF	47.2	-0.3	710.0	64.3	5.5	879.8	239.8	11.6	3.7	1.4	4.3	99
NF	47.2	-0.3	710.0	53.0	4.3	665.1	253.3	12.3	2.6	1.3	5.9	
PF	47.2	-0.3	710.0	44.2	2.2	505.0	122.3	19.8	4.1	1.1	5.5	
PF	47.2	-0.3	710.0	58.8	4.1	460.1	161.2	14.2	2.9	0.8	3.9	
NF	42.4	2.8	750.0	29.2	2.9	849.4	103.3	10.0	8.2	2.9	3.5	150
NF	42.4	2.8	750.0	33.4	2.4	637.0	97.6	13.8	6.5	1.9	4.0	
NF	42.4	2.8	750.0	52.1	3.3	909.2	163.9	15.8	5.5	1.7	5.0	
PF	43.0	6.0	450.0	4.7		71.3				1.5		73
PF	42.6	6.5	920.0	19.9		118.9				0.6		
PF	42.6	6.5	920.0	17.8		247.9				1.4		
PF	42.6	6.5	920.0	18.4		179.0				1.0		
PF	41.9	4.7	775.0	22.9	2.0	403.7	45.1	11.7	9.0	1.8	2.3	156
PF	41.9	4.7	775.0	21.5	1.8	290.6	37.4	11.9	7.8	1.4	2.1	
NF	45.4	2.8	723.0	55.1	4.3	754.5	124.4	12.9	6.1	1.4	2.9	26
NF	45.4	2.8	723.0	44.4	3.7	1039.7		12.0		2.3		65
NF	45.4	2.8	723.0	63.7	5.9	1281.5		10.8		2.0		
PF	45.4	2.8	723.0	56.1	5.0	989.8		11.2		1.8		
NF	51.8	-2.8	450.0	47.9	3.5	667.3	61.7	13.7	10.8	1.4	1.8	2
PF	51.8	-2.4	470.0	35.5		161.6				0.5		114
NF	46.4	3.2	540.0	33.6	2.1	264.8	39.0	16.1	6.8	0.8	1.9	58
NF	46.4	3.2	540.0	18.8	1.0	263.5	17.6	18.2	14.9	1.4	1.7	
NF	46.4	3.2	540.0	24.0	1.6	134.7	24.4	15.3	5.5	0.6	1.6	
NF	44.4	2.7	700.0	26.0	1.5	158.6	52.4	17.5	3.0	0.6	3.5	
NF	44.4	2.7	700.0	15.7	0.7	249.4	52.1	21.4	4.8	1.6	7.1	
NF	44.4	2.7	700.0	23.3	1.4	266.8	49.6	16.9	5.4	1.1	3.6	

NF	42.4	2.5	689.0	22.0		331.4	47.9		6.9	1.5		1
NF	42.4	-0.5	855.0	27.7		662.9	66.8		9.9	2.4		
NF	42.4	-3.3	1074.0	64.8		305.6	32.9		9.3	0.5		
PF	42.4	-1.2	437.8	12.2		237.7				1.9		131
NF	44.2	3.6	506.4	47.6	2.0	137.6	9.6	23.5	14.4	0.3	0.5	40
NF	44.1	3.6	506.4	37.4	3.1	198.6	10.5	12.1	18.9	0.5	0.3	
NF	44.1	3.6	506.4	32.5	3.0	181.9	8.4	10.8	21.8	0.6	0.3	
NF	44.1	3.6	506.4	40.8	3.7	185.5	10.0	11.0	18.6	0.5	0.3	
NF	44.1	3.6	506.4	38.8	3.3	177.5	8.8	11.7	20.1	0.5	0.3	
NF	51.6	-4.0	458.3	40.6	1.9	864.0	153.6	21.8	5.6	2.1	8.3	53
NF	45.4	2.8	773.0	44.0	3.7	191.4	55.2	11.9	3.5	0.4	1.5	109
NF	45.4	2.8	773.0	51.8	4.9	192.3	66.8	10.6	2.9	0.4	1.4	
NF	45.4	2.8	773.0	68.8	5.1	205.8	44.9	13.4	4.6	0.3	0.9	
PF	45.4	2.8	773.0	49.0	3.5	199.0	43.0	14.0	4.6	0.4	1.2	
PF	45.4	2.8	773.0	58.9	3.4	576.2	56.8	17.6	10.1	1.0	1.7	81
PF	45.4	2.8	773.0	45.8	2.9	470.2	45.4	15.8	10.4	1.0	1.6	
NF	45.4	2.8	773.0	69.4	3.3	488.8	53.1	21.1	9.2	0.7	1.6	
NF	45.4	2.8	773.0	83.2	6.2	902.1	96.8	13.5	9.3	1.1	1.6	
NF	45.4	2.8	773.0	72.0	3.3	654.6	75.1	21.8	8.7	0.9	2.3	
NF	48.1	-0.5	715.0	71.1	3.7	489.4		19.1		0.7		105
NF	48.1	-0.5	715.0	36.2	3.9	359.5		9.2		1.0		
NF	47.2	-0.3	676.0	32.4	3.8	525.2	72.9	8.5	7.2	1.6	1.9	75
NF	47.2	-0.3	676.0	33.1	3.5	536.4	77.0	9.4	7.0	1.6	2.2	
NF	47.2	-0.3	676.0	39.4	3.0	649.1	97.3	13.2	6.7	1.6	3.3	
PF	47.2	-0.3	676.0	31.8	3.3	517.1	67.0	9.7	7.7	1.6	2.0	
PF	47.2	-0.3	676.0	42.5	2.8	524.7	71.5	15.0	7.3	1.2	2.5	
PF	47.2	-0.3	676.0	31.6	3.3	342.8	48.8	9.5	7.0	1.1	1.5	
NF	51.4	-3.0	500.0	33.7	2.4	419.2	42.9	13.9	9.8	1.2	1.8	188
NF	42.4	2.4	750.0	34.6	2.2	385.7	54.7	15.8	7.1	1.1	2.5	32
NF	42.4	2.4	750.0	31.0	1.8	270.8	46.6	16.9	5.8	0.9	2.5	

	NF	42.4	2.4	750.0	25.3	1.5	257.3	35.5	17.1	7.3	1.0	2.4	
	NF	42.4	2.4	750.0	36.8	2.2	422.3	42.9	16.4	9.8	1.1	1.9	
	NF	42.4	2.4	750.0	34.1	2.2	411.9	56.7	15.6	7.3	1.2	2.6	
	NF	42.3	2.4	750.0	39.3	2.3	288.0	51.5	17.1	5.6	0.7	2.2	
	NF	42.2	2.4	750.0	32.2	1.8	429.2	46.1	17.7	9.3	1.3	2.5	
WT	PF	36.0	7.4	587.6	15.1	1.1	344.5	58.5	13.8	5.9	2.3	5.4	43
	PF	36.1	7.4	587.6	17.2	1.3	334.3	57.8	12.8	5.8	1.9	4.3	
	PF	36.1	7.4	587.6	14.8	1.0	379.6	29.6	14.8	12.8	2.6	3.0	
	PF	36.1	7.4	587.6	22.3	2.0	528.0	73.8	11.3	7.2	2.4	3.7	
	PF	35.8	7.4	587.6	12.8	1.2	279.0		11.2		2.2		167
	PF	35.8	7.4	587.6	18.4	1.5	421.1		12.7		2.3		
	PF	35.8	7.4	587.6	23.3	1.7	551.6		13.7		2.4		
	PF	35.8	7.4	587.6	23.9	1.7	583.7		13.7		2.4		
	PF	36.8	8.8	505.3	5.9	0.7	285.6	40.7	8.1	7.0	4.8	5.6	151
	PF	36.8	8.8	505.3	5.7	0.7	304.0	41.3	8.1	7.4	5.3	5.8	
	PF	36.8	8.8	505.3	6.4	0.7	287.5	26.8	9.7	10.7	4.5	4.0	
	PF	36.8	8.8	505.3	6.8	0.8	316.1	34.5	8.5	9.2	4.6	4.3	
	PF	36.8	8.8	505.3	9.3	0.9	313.4	31.0	10.5	10.1	3.4	3.5	
	NF	37.3	0.8	424.5	76.7	5.5	504.2	57.6	14.1	8.8	0.7	1.1	153
	NF	37.3	0.8	424.5	113.2	7.1	513.4	80.3	16.0	6.4	0.5	1.1	
	NF	37.3	0.8	424.5	105.7	6.6	503.5	53.4	16.0	9.4	0.5	0.8	
	NF	37.8	-1.7	580.0	66.5	6.8	643.4	81.8	9.7	7.9	1.0	1.2	98
	NF	38.8	6.2	330.0	5.2	0.2	200.1	5.3	33.4	37.7	3.8	3.4	46
	NF	38.8	2.3	340.5	75.7	4.7	514.3	90.4	16.2	5.7	0.7	1.9	74
	NF	38.8	4.9	280.4	61.9	4.1	449.0	72.5	15.0	6.2	0.7	1.8	
	NF	38.7	7.0	224.0	13.1	1.5	135.6	34.3	8.7	4.0	1.0	2.3	
	PF	35.0	14.3	641.7	9.3	1.2	397.8	36.4	7.5	10.9	4.3	2.9	189
	PF	35.0	14.3	641.7	10.4	1.2	376.4	33.5	8.6	11.2	3.6	2.8	
	PF	35.0	14.3	641.7	13.3	1.4	395.7	27.3	9.3	14.5	3.0	1.9	
	PF	33.9	14.3	904.6	12.9		475.0				3.7		100

NF	36.6	8.8	505.3	23.7		351.8				1.5		173
NF	36.6	8.8	505.3	14.3		230.3				1.6		
NF	36.6	8.8	505.3	23.5		405.2				1.7		
NF	36.6	8.8	505.3	8.7		129.9				1.5		
PF	36.6	8.8	505.3	7.8		103.7				1.3		
NF	36.6	8.8	505.3	30.3		465.9				1.5		
NF	35.3	8.3	623.5	8.5	0.9	119.3		9.0		1.4		115
NF	35.3	8.3	623.5	10.0	2.0	248.7		5.0		2.5		
NF	35.3	8.3	623.5	10.7	1.6	284.9		6.8		2.7		
NF	35.3	8.3	623.5	10.7	2.2	404.1		5.0		3.8		
PF	35.8	6.7	390.0	9.3	1.0	331.9	101.0	9.4	3.3	3.6	10.2	187
PF	35.8	6.7	390.0	5.8	0.6	263.2	107.0	9.2	2.5	4.6	17.1	
PF	35.8	6.7	390.0	6.1	0.7	224.7	82.1	8.6	2.7	3.7	11.6	
PF	36.7	9.9	550.0	2.8	0.3	71.1	18.9	8.4	3.8	2.6	5.8	31
PF	36.7	9.9	550.0	3.0	0.3	63.3	10.7	9.2	5.9	2.1	3.3	
PF	36.7	9.9	550.0	2.9	0.3	40.4	13.3	9.3	3.0	1.4	4.3	
PF	36.7	9.9	550.0	3.7	0.4	165.8	24.8	8.6	6.7	4.4	5.7	30
PF	36.7	9.9	550.0	5.8	0.6	181.1	37.2	9.8	4.9	3.1	6.3	
PF	36.7	9.9	550.0	2.8	0.3	40.4	13.2	8.4	3.1	1.5	4.0	
PF	36.7	9.9	550.0	3.0	0.3	63.5	10.4	9.2	6.1	2.1	3.2	
PF	36.7	9.9	550.0	2.9	0.3	70.5	18.9	9.3	3.7	2.4	6.0	
NF	36.4	9.0	500.0	15.5	1.2	473.8	42.3	13.3	11.2	3.1	3.6	193
NF	36.5	9.0	500.0	14.8	1.2	262.5	33.3	11.9	7.9	1.8	2.7	
PF	36.7	8.8	505.3	2.6	0.3	138.4		8.6		5.4		76
PF	36.8	8.8	505.3	3.3	0.3	200.2		11.5		6.0		
PF	36.7	8.8	505.3	3.6	0.5	221.8		7.6		6.1		
PF	36.8	8.8	505.3	5.1	0.6	303.0		8.2		6.0		
PF	36.8	8.8	505.3	3.2	0.4	181.8	20.6	8.8	8.8	5.8	5.7	152
PF	36.8	8.8	505.3	4.2	0.5	194.2	27.1	7.8	7.2	4.6	5.1	
PF	36.8	8.8	505.3	6.5	0.7	247.3	39.0	8.9	6.3	3.8	5.4	

PF	36.8	8.8	505.3	6.7	0.8	282.6	39.9	7.9	7.1	4.2	4.7	
PF	36.8	8.8	505.3	5.7	0.7	304.0	41.3	8.1	7.4	5.3	5.8	
PF	36.8	8.8	505.3	4.9	0.5	157.0	25.0	8.9	6.3	3.2	4.6	
PF	36.8	8.8	505.3	10.1	1.0	359.9	46.8	10.5	7.7	3.5	4.8	
NF	36.8	8.8	505.3	20.8	1.9	793.9	103.9	11.0	7.6	3.8	5.5	
PF	37.8	8.4	422.0	4.3		256.2	18.6		13.8	6.0		14
PF	37.8	8.4	422.0	4.9		267.5	7.8		34.5	5.5		
PF	37.8	8.4	422.0	4.0		216.8	6.4		33.8	5.4		
PF	37.8	8.4	422.0	2.8		146.8	7.1		20.6	5.2		
PF	37.8	8.4	422.0	4.7		173.2	11.8		14.7	3.7		
PF	36.6	9.0	500.0	6.7	0.9	242.5	23.3	7.8	10.4	3.6	2.7	194
PF	37.0	9.0	500.0	5.7	0.8	225.5	27.5	6.8	8.2	4.0	3.3	
PF	34.7	10.0	611.0	15.5	1.6	281.6	42.4	10.0	6.6	1.8	2.7	125
PF	34.7	10.0	611.0	16.1	1.7	537.3	98.9	9.6	5.4	3.3	5.9	
PF	34.7	10.0	611.0	13.5	1.4	459.2	92.1	9.4	5.0	3.4	6.4	
PF	34.3	14.0	850.0	35.6	3.0	556.4	63.6	11.9	8.7	1.6	2.1	96
PF	35.3	14.1	850.0	13.4		321.6				2.4		130
PF	35.3	14.1	850.0	14.5		410.4				2.8		
NF	36.6	6.2	662.0	45.3	1.7	236.1	76.2	26.6	3.1	0.5	4.5	56
PF	36.0	7.0	420.0	13.9	0.9	483.1	40.0	15.1	12.1	3.5	4.3	9
PF	36.0	7.0	420.0	13.3	1.3	401.1	28.0	10.0	14.3	3.0	2.1	10
PF	36.0	7.0	420.0	14.9	0.5	573.8	51.9	31.0	11.1	3.9	10.8	
NF	40.0	6.5	575.0	22.6	2.8	356.5	42.1	8.1	8.5	1.6	1.5	171
NF	40.0	6.5	575.0	23.0	2.8	325.1	42.2	8.3	7.7	1.4	1.5	
NF	40.0	6.5	575.0	24.5	3.0	346.6	41.9	8.3	8.3	1.4	1.4	
PF	35.0	14.3	641.7	9.3	1.2	397.6	36.0	7.5	11.1	4.3	2.9	190
PF	35.0	14.3	641.7	10.4	1.2	378.3	33.1	8.6	11.4	3.6	2.7	
PF	35.0	14.3	641.7	13.3	1.4	400.6	26.6	9.3	15.0	3.0	1.9	
NF	34.3	11.0	750.0	37.6		529.6				1.4		110
NF	34.2	11.0	750.0	18.3		273.4				1.5		

	NF	34.2	11.0	750.0	18.7		470.4				2.5		
	NF	34.2	11.0	750.0	22.5		417.2				1.9		
	NF	34.2	11.0	750.0	44.0		502.3				1.1		
	NF	34.2	11.0	750.0	30.8		512.4				1.7		
	PF	34.6	8.7	800.0	34.5	1.2	82.7	32.3	29.2	2.6	0.2	2.7	160
	PF	34.6	8.7	800.0	20.1	0.7	67.0	26.4	27.1	2.5	0.3	3.6	
	PF	34.6	8.7	800.0	15.3	0.8	67.0	21.2	19.6	3.2	0.4	2.7	
	PF	34.6	8.7	800.0	12.0	1.1	79.0	15.6	11.0	5.1	0.7	1.4	
	PF	34.6	8.7	800.0	10.9	0.7	53.4	15.2	16.0	3.5	0.5	2.2	
	PF	34.6	8.7	800.0	19.1	0.8	70.0	30.4	23.5	2.3	0.4	3.8	
	NF	34.6	8.7	800.0	73.6	5.5	220.0	67.6	13.3	3.3	0.3	1.2	
	NF	34.6	8.7	800.0	51.4	3.3	134.0	42.4	15.5	3.2	0.3	1.3	
	PF	34.6	8.7	800.0	45.4	1.6	207.0	50.2	28.2	4.1	0.5	3.1	
	NF	36.0	7.4	587.6	12.1		344.5				2.9		44
	NF	36.1	7.4	587.6	17.2		334.2				1.9		
	NF	36.1	7.4	587.6	14.8		379.6				2.6		
	NF	36.1	7.4	587.6	22.3		527.9				2.4		
	PF	36.1	7.4	587.6	11.8		272.0				2.3		
ST	NF	24.5	14.5	1840.0	46.4	3.0	1054.9		15.4		2.3		22
	NF	26.9	16.5	1300.0	17.7		233.4				1.3		174
	PF	26.9	16.5	1300.0	13.8		98.2				0.7		
	PF	26.9	16.5	1300.0	15.5		171.5				1.1		
	PF	26.9	16.5	1300.0	13.9		131.8				0.9		
	PF	23.2	22.7	1956.0	11.4		325.8				2.9		66
	PF	23.2	20.9	1956.0	15.1		425.9				2.8		
	NF	23.2	20.4	1956.0	20.8		541.8				2.6		
	NF	26.8	16.5	1300.0	23.0	1.7	493.9		13.7		2.2		119
	PF	26.8	16.5	1300.0	22.2	1.2	257.8		17.8		1.2		
	PF	26.8	16.5	1300.0	15.2	1.1	239.3		14.3		1.6		
	NF	30.9	15.3	1286.0	18.8	1.4	390.5		13.2		2.1		64

PF	30.9	15.3	1286.0	15.7	1.5	312.4		10.3		2.0			
PF	30.9	15.3	1286.0	13.3	1.6	245.6		8.5		1.8			
PF	30.9	15.3	1286.0	12.9	1.6	219.5		8.0		1.7			
NF	26.9	16.5	1300.0	27.3	2.2	249.1		12.6		0.9			78
PF	26.9	16.5	1300.0	19.5	1.3	184.4		14.6		0.9			
PF	26.9	16.5	1300.0	18.0	1.2	147.9		14.7		0.8			
PF	26.9	16.5	1300.0	13.9	0.9	132.7		14.8		1.0			
PF	26.9	16.5	1300.0	12.3	1.2	159.8		9.9		1.3			
PF	26.9	16.5	1300.0	14.2	1.3	191.6		11.0		1.3			
PF	26.9	16.5	1300.0	10.1	1.0	181.3		10.1		1.8			
PF	26.9	16.5	1300.0	7.3	0.8	164.2		8.8		2.2			
NF	25.3	14.3	1672.0	92.3	9.6	1711.9	283.9	9.6	6.0	1.9	2.9		88
NF	25.3	14.3	1672.0	49.4	4.8	1268.5	215.6	10.2	5.9	2.6	4.4		
PF	25.3	14.3	1672.0	28.9	1.7	501.5	86.1	17.2	5.8	1.7	5.1		
NF	26.2	19.1	1749.0	26.8		822.9				3.1			161
PF	26.2	19.1	1749.0	18.8		489.4				2.6			
PF	26.2	19.1	1749.0	17.3		407.5				2.4			
PF	23.2	21.5	1956.0	13.1	0.9	291.0		14.7		2.2			7
NF	23.2	21.5	1956.0	12.6	0.8	346.2		15.3		2.7			
NF	23.2	21.5	1956.0	15.9	1.7	485.1		9.5		3.1			
PF	27.1	17.9	1237.0	8.0	0.5	119.4		14.8		1.5			197
PF	27.1	17.9	1237.0	10.7	0.7	128.5		14.6		1.2			
PF	27.1	17.9	1237.0	10.6	0.7	142.4		14.3		1.3			
NF	27.1	17.9	1237.0	14.1	1.0	175.7		14.1		1.2			
PF	26.7	18.6	1726.0	5.7	0.4	99.8		14.4		1.8			51
PF	26.7	18.6	1726.0	8.1	0.6	151.0		14.5		1.9			
PF	26.7	18.6	1726.0	9.8	0.7	205.0		13.6		2.1			
PF	26.7	18.6	1726.0	11.7	0.9	289.7		12.8		2.5			
PF	26.7	18.6	1726.0	5.8	0.4	142.5		13.3		2.5			
PF	26.7	18.6	1726.0	12.5	0.9	296.3		13.8		2.4			

PF	26.7	18.6	1726.0	8.8	0.7	209.6		13.4		2.4		
PF	26.7	18.6	1726.0	13.9	1.1	339.4		13.2		2.4		
PF	22.7	21.7	1700.0	13.9		152.9				1.1		144
NF	25.1	18.5	1389.0	50.8	6.0	1698.1		8.4		3.3		206
NF	24.8	18.5	1389.0	28.4	3.4	859.9		8.3		3.0		
NF	24.8	18.5	1389.0	52.0	6.6	2012.9		7.9		3.9		
PF	28.3	17.8	1785.0	5.8	0.4	110.8		14.1		1.9		13
PF	28.3	17.8	1785.0	6.2	0.4	114.9		14.6		1.8		
PF	28.3	17.8	1785.0	8.4	0.5	150.8		16.3		1.8		
PF	28.3	17.8	1785.0	3.0	0.3	102.5		10.9		3.4		
PF	28.3	17.8	1785.0	3.7	0.3	87.7		11.2		2.4		
PF	28.3	17.8	1785.0	4.4	0.4	136.8		11.8		3.1		
NF	26.8	12.8	1050.0	37.0	2.3	385.3	70.1	15.9	5.5	1.0	3.0	106
NF	26.8	12.8	1050.0	20.3	1.4	150.4	42.3	14.9	3.6	0.7	3.1	
NF	26.8	12.8	1050.0	22.5	1.0	99.1	33.4	22.0	3.0	0.4	3.3	
NF	26.8	12.8	1050.0	13.6	1.0	57.1	39.9	14.3	1.4	0.4	4.2	
NF	26.8	12.8	1050.0	30.5	2.2	347.7	71.6	14.0	4.9	1.1	3.3	
NF	26.8	12.8	1050.0	11.6	0.8	84.8	34.3	13.9	2.5	0.7	4.1	
NF	26.8	12.8	1050.0	26.5	2.2	210.7	76.6	12.1	2.7	0.8	3.5	
NF	26.8	12.8	1050.0	18.0	1.1	114.8	37.1	16.0	3.1	0.6	3.3	
NF	26.8	12.8	1050.0	20.3	2.0	255.8	77.1	10.3	3.3	1.3	3.9	
NF	26.8	12.8	1050.0	18.2	1.5	166.5	78.4	12.3	2.1	0.9	5.3	
NF	26.8	12.8	1050.0	21.3	1.8	207.3	106.9	11.8	1.9	1.0	5.9	
NF	26.8	12.8	1050.0	20.0	1.5	225.8	58.2	13.0	3.9	1.1	3.8	
NF	26.8	12.8	1050.0	46.2	4.2	577.6	273.4	11.1	2.1	1.3	6.6	
NF	26.8	12.8	1050.0	46.2	5.7	1157.9	311.9	8.0	3.7	2.5	5.4	
NF	26.8	12.8	1050.0	37.9	1.8	429.8	197.8	21.3	2.2	1.1	11.1	
NF	26.8	16.5	1300.0	23.0	1.7	484.4	49.0	13.5	9.9	2.1	2.9	116
PF	26.8	16.5	1300.0	22.3	1.3	258.6	46.8	17.6	5.5	1.2	3.7	
PF	26.8	16.5	1300.0	15.5	1.1	244.2	40.6	14.4	6.0	1.6	3.8	

NF	26.8	16.5	1200.0	19.0	1.7	404.9		11.2		2.1		121
PF	26.8	16.5	1200.0	22.4	1.6	469.9		13.9		2.1		
PF	26.8	16.5	1200.0	21.2	1.5	523.1		14.3		2.5		
PF	26.8	16.5	1200.0	22.0	1.7	588.8		12.9		2.7		
NF	29.9	16.0	1374.0	17.5	1.2	1135.1		14.7		6.5		23
PF	26.8	19.3	1669.0	13.3	0.9	300.1		14.4		2.3		41
PF	26.8	19.3	1669.0	16.5	1.0	428.2		16.3		2.6		
PF	22.9	22.1	1800.0	12.5	0.9	255.0		14.6		2.0		3
PF	22.9	22.1	1800.0	10.5	0.8	175.9		13.2		1.7		
PF	22.9	22.1	1800.0	14.1	1.1	252.4		12.4		1.8		
PF	26.8	16.5	1300.0	10.3	1.1	233.3	18.3	9.6	12.7	2.3	1.7	117
PF	26.8	16.5	1300.0	10.8	1.2	259.7	31.8	8.6	8.2	2.4	2.5	
PF	26.8	16.5	1300.0	11.8	1.3	246.9	28.8	9.1	8.6	2.1	2.2	
NF	26.3	15.1	1315.0	41.3	3.7	907.2	161.1	11.2	5.6	2.2	4.4	61
NF	26.3	15.1	1315.0	31.2	2.9	424.3	77.6	10.7	5.5	1.4	2.7	
NF	26.3	15.1	1315.0	20.7	2.4	291.5	60.7	8.8	4.8	1.4	2.6	
PF	26.7	18.6	1726.0	6.8	0.5	107.6	14.8	14.3	7.3	1.6	3.1	50
PF	26.7	18.6	1726.0	10.3	0.7	184.7	26.6	14.5	6.9	1.8	3.8	
PF	26.7	18.6	1726.0	10.5	0.8	194.2	25.0	13.9	7.8	1.9	3.3	
PF	26.7	18.6	1726.0	14.0	1.1	271.5	32.3	13.2	8.4	1.9	3.1	
PF	26.7	18.6	1726.0	6.9	0.5	137.4	16.2	13.8	8.5	2.0	3.2	
PF	26.7	18.6	1726.0	15.6	1.1	300.4	37.2	14.5	8.1	1.9	3.4	
PF	26.7	18.6	1726.0	11.1	0.8	238.2	34.4	13.5	6.9	2.1	4.2	
PF	26.7	18.6	1726.0	16.2	1.2	313.6	40.8	13.6	7.7	1.9	3.4	
PF	26.6	19.4	1800.0	11.6	0.6	116.9	15.1	18.7	7.7	1.0	2.4	143
PF	26.6	19.4	1800.0	15.1	0.7	278.9	31.5	21.6	8.9	1.8	4.5	
PF	26.6	19.4	1800.0	14.6	0.7	277.5	29.3	19.7	9.5	1.9	4.0	
PF	26.8	16.5	1300.0	15.7		145.5				0.9		176
PF	26.8	16.5	1300.0	17.0		191.7				1.1		
PF	26.8	16.5	1300.0	18.8		230.8				1.2		

NF	21.9	22.0	1400.0	11.8	1.2	524.9	64.2	9.4	8.2	4.5	5.1	150
NF	24.5	9.4	1974.0	184.5	9.4	1543.5	340.7	19.6	4.5	0.8	3.6	69
NF	32.0	15.3	1055.6	16.9	3.2	225.7		5.3		1.3		111
PF	32.0	15.3	1055.6	8.1	2.6	232.1		3.1		2.8		
PF	27.2	16.5	1300.0	18.8		238.6				1.3		177
PF	31.9	16.0	1143.4	10.3		348.6				3.4		54
PF	31.9	16.0	1143.4	5.3		170.0				3.2		
PF	31.9	16.0	1143.4	4.3		119.0				2.8		
PF	31.9	16.0	1143.4	5.4		135.8				2.5		
PF	28.3	17.8	1785.0	5.8	0.7	112.3	14.7	8.7	7.6	1.9	2.2	79
PF	31.3	15.7	1280.0	8.2	0.7	146.4	18.0	11.3	8.2	1.8	2.5	68
NF	26.2	19.1	1749.0	26.3	1.9	1285.9	200.6	13.9	6.4	4.9	10.6	60
PF	26.2	19.1	1749.0	18.6	1.1	841.7	127.3	16.5	6.6	4.5	11.3	
PF	26.2	19.1	1749.0	16.4	1.1	654.2	104.8	14.7	6.2	4.0	9.4	
NF	30.2	15.9	1424.0	20.8		447.8				2.1		48
NF	30.2	15.9	1424.0	10.3		200.2				1.9		
PF	30.2	15.9	1424.0	13.0		286.3				2.2		
PF	28.3	17.6	1794.0	21.1	2.5	727.0	27.5	8.3	26.4	3.5	1.1	45
PF	28.3	17.6	1794.0	26.1	3.1	834.2	29.3	8.5	28.5	3.2	1.0	
PF	28.2	17.6	1794.0	3.6	0.3	92.2	8.4	14.2	11.0	2.6	3.4	191
PF	26.6	18.6	1370.5	12.6	0.8	198.1	16.5	16.9	12.0	1.6	2.2	
PF	25.4	19.4	1423.4	11.4	0.6	223.5	23.3	18.1	9.6	2.0	3.7	
PF	25.9	16.5	1300.0	14.1	1.3	429.3	69.6	10.6	6.2	3.0	5.2	39
PF	25.9	16.5	1300.0	13.8	1.3	389.6	60.0	10.5	6.5	2.8	4.5	
PF	25.9	16.5	1300.0	13.6	1.3	287.2	34.3	10.8	8.4	2.1	2.7	
PF	27.1	17.9	1237.0	8.0	0.5	119.7		14.8		1.5		196
PF	27.1	17.9	1237.0	10.7	0.7	128.2		14.6		1.2		
NF	27.1	17.9	1237.0	14.1	1.0	176.4		14.1		1.3		
NF	27.1	17.9	1237.0	32.4	2.8	246.4	136.9	11.4	1.8	0.8	4.8	
PF	27.1	17.9	1237.0	15.4	1.5	239.7	75.6	10.2	3.2	1.6	5.0	

NF	27.1	17.9	1237.0	53.6	5.4	182.2	180.3	9.9	1.0	0.3	3.3	
NF	27.2	16.5	1300.0	17.7	1.6	199.2		11.4		1.1		175
PF	27.2	16.5	1300.0	13.8	1.1	129.5		12.0		0.9		
PF	27.2	16.5	1300.0	15.6	1.3	156.9		12.1		1.0		
PF	27.2	16.5	1300.0	13.9	1.1	144.9		12.1		1.0		
NF	30.0	16.0	1350.0	15.6	1.2	338.0		12.7		2.2		207
NF	30.0	16.0	1350.0	11.9	0.8	293.0		15.9		2.5		
PF	30.0	16.0	1350.0	11.3	0.8	260.0		15.1		2.3		
NF	31.6	11.6	950.0	39.9	2.9	638.6		13.8		1.6		186
NF	31.6	11.6	950.0	20.6	1.5	511.6		13.8		2.5		
NF	23.2	21.6	1967.8	22.5	0.9	129.5	17.1	24.4	7.6	0.6	1.9	178
NF	25.1	15.7	1389.1	32.4	2.8	246.4	136.9	11.4	1.8	0.8	4.8	101
PF	25.1	15.7	1389.1	15.4	1.5	239.7	75.6	10.2	3.2	1.6	5.0	
NF	25.1	15.7	1389.1	53.6	5.4	182.2	180.3	9.9	1.0	0.3	3.3	
NF	25.1	15.7	1389.1	67.1	4.5	946.2	323.3	15.0	2.9	1.4	7.2	
NF	26.2	19.1	1749.0	26.5	1.9	1278.8	201.0	14.0	6.4	4.8	10.6	59
PF	26.2	19.1	1749.0	18.8	1.1	838.7	129.8	16.7	6.5	4.5	11.5	
PF	26.2	19.1	1749.0	16.7	1.1	658.5	104.5	14.9	6.3	3.9	9.3	
PF	29.1	17.7	1439.0	21.8		378.5				1.7		202
PF	29.1	17.7	1439.0	14.5		289.9				2.0		
PF	29.1	17.7	1439.0	6.6		98.3				1.5		
NF	29.8	13.6	1611.8	13.9	1.1	412.9	16.3	12.3	25.3	3.0	1.4	26
PF	29.3	16.3	1320.5	31.2	5.2	47.3	2.9	6.1	16.5	0.2	0.1	164
PF	29.3	16.3	1320.5	31.8	9.1	49.9	3.4	3.5	14.6	0.2	0.0	
NF	29.3	16.3	1320.5	35.6	9.1	54.8	3.3	3.9	16.9	0.2	0.0	
NF	30.2	15.9	1424.0	21.7	1.4	347.8	72.9	15.9	4.8	1.6	5.3	139
PF	27.2	15.8	1300.0	13.0	1.3	438.0		9.9		3.4		122
NF	27.2	15.8	1300.0	23.3	2.0	712.5		11.6		3.1		
NF	28.7	12.8	1780.0	68.8	2.8	234.9	32.3	24.5	7.3	0.3	1.2	24
PF	28.7	12.8	1780.0	55.9	2.5	198.9	26.8	22.4	7.4	0.4	1.1	

PF	28.7	12.8	1780.0	21.3	1.4	75.0	10.5	15.1	7.2	0.4	0.7	
PF	28.7	12.8	1780.0	48.3	2.3	178.3	23.5	20.7	7.6	0.4	1.0	
NF	23.1	21.0	1927.0	31.8		695.1				2.2		162
PF	23.1	21.0	1927.0	22.4		509.5				2.3		
PF	23.1	21.0	1927.0	19.6		462.6				2.4		
NF	30.4	16.9	1350.0	19.0		866.1				4.6		129
NF	26.2	19.1	1749.0	26.6		823.0				3.1		66
PF	26.2	19.1	1749.0	18.7		489.3				2.6		
PF	26.2	19.1	1749.0	17.1		407.2				2.4		
PF	26.7	19.4	1817.0	27.0		488.9				1.8		18
PF	26.7	19.4	1817.0	20.4		338.3				1.7		
NF	26.7	19.4	1817.0	23.5		485.4				2.1		
NF	30.9	16.0	1350.0	17.8		623.0				3.5		149
NF	30.9	16.0	1350.0	15.5		338.0				2.2		
NF	24.8	20.4	1583.5	14.0	1.7	347.6	30.7	8.4	11.3	2.5	1.8	146
NF	23.1	22.0	1736.1	13.2	1.4	254.7	28.8	9.3	8.8	1.9	2.0	
NF	21.1	23.5	1885.0	13.0	2.0	328.0	36.9	6.4	8.9	2.5	1.8	
PF	23.2	21.6	1782.5	12.6		300.0				2.4		183
PF	23.2	21.6	1782.5	13.6		370.0				2.7		
PF	23.2	21.6	1782.5	14.8		460.0				3.1		
NF	23.2	21.6	1782.5	19.3		570.0				3.0		
NF	23.2	21.6	1782.5	25.2		810.0				3.2		
NF	23.2	21.6	1782.5	31.1		1100.0				3.5		
NF	25.9	15.8	1100.0	16.3		436.5				2.7		132
NF	25.9	15.8	1100.0	18.4		516.2				2.8		
NF	26.3	15.1	1396.9	33.8	2.9	477.8	82.4	11.8	5.8	1.4	2.9	36
NF	26.3	15.1	1396.9	27.7	2.6	471.5	53.1	10.8	8.9	1.7	2.1	
NF	26.3	15.1	1396.9	28.4	2.4	433.3	37.7	11.8	11.5	1.5	1.6	
NF	25.2	16.9	1675.0	55.1	6.3	1020.6	87.4	8.7	11.7	1.9	1.4	82
NF	24.8	18.5	1389.1	49.1	5.5	1084.4	104.9	8.9	10.3	2.2	1.9	

NF	24.8	18.5	1389.1	44.9	5.6	564.9	76.2	8.0	7.4	1.3	1.4	
NF	23.4	20.6	1500.0	34.1	3.5	655.0	39.8	9.7	16.4	1.9	1.1	145
NF	23.4	20.6	1500.0	25.8	1.9	448.2	34.6	13.4	12.9	1.7	1.8	
NF	31.7	11.6	950.0	30.6		850.7				2.8		87
NF	31.8	11.6	950.0	30.3		614.5				2.0		
NF	31.8	11.6	950.0	29.7		533.2				1.8		
NF	31.8	11.6	950.0	18.5		476.2				2.6		
NF	31.8	11.6	950.0	22.3		429.0				1.9		
PF	22.7	21.7	1801.1	10.2		264.2				2.6		203
PF	22.7	21.7	1801.1	10.8		378.3				3.5		
PF	22.7	21.7	1801.1	13.8		504.9				3.7		
PF	28.3	17.6	1794.0	2.8	0.2	27.1	3.8	12.9	7.1	1.0	1.7	192
PF	28.3	17.6	1794.0	4.0	0.3	34.6	4.8	15.9	7.1	0.9	1.9	
PF	28.3	17.6	1794.0	3.0	0.3	46.0	5.4	10.3	8.6	1.5	1.9	
NF	28.3	17.6	1794.0	6.5	0.5	78.9	7.4	12.0	10.6	1.2	1.4	
PF	28.3	17.6	1794.0	2.8	0.2	24.2	4.1	12.1	5.9	0.9	1.8	
PF	22.2	21.7	1638.8	9.6	0.5	231.4		18.5		2.4		77
PF	22.2	21.7	1638.8	12.0	0.5	310.1		22.0		2.6		
PF	22.2	21.7	1638.8	19.2	1.5	326.8		12.9		1.7		
PF	22.2	21.7	1638.8	16.4	0.9	349.2		18.9		2.1		
PF	31.5	15.5	1078.1	11.0	1.4	363.6	43.4	7.9	8.4	3.3	3.1	6
PF	29.4	16.6	1394.0	8.7		242.1				2.8		84
PF	29.4	16.6	1394.0	9.5		309.1				3.2		
PF	29.4	16.6	1394.0	8.3		246.7				3.0		
PF	29.4	16.6	1394.0	10.2		194.0				1.9		
NF	24.8	18.2	1389.0	24.1	2.3	529.0	117.0	10.3	4.5	2.2	5.0	63
NF	24.1	15.7	1389.1	32.4	3.0	246.4	136.9	11.0	1.8	0.8	4.6	165
PF	24.1	15.7	1389.1	15.4	1.7	239.7	75.6	9.0	3.2	1.6	4.4	
NF	24.1	15.7	1389.1	53.6	5.6	182.2	180.3	9.5	1.0	0.3	3.2	
NF	24.1	15.7	1389.1	67.1	5.9	946.2	323.3	11.4	2.9	1.4	5.5	

NF	25.2	16.9	1675.0	17.9	5.2	782.4	115.6	3.4	6.8	4.4	2.2	21
NF	25.2	16.9	1675.0	28.0	6.5	1385.3	109.1	4.3	12.7	4.9	1.7	
NF	25.2	16.9	1675.0	19.1	3.2	706.8	113.4	6.0	6.2	3.7	3.5	
NF	24.8	18.5	1389.1	14.4	3.3	419.0	40.3	4.4	10.4	2.9	1.2	
NF	24.8	18.5	1389.1	29.2	3.0	1068.3	111.7	9.6	9.6	3.7	3.7	70
NF	24.8	18.5	1389.1	47.8	4.6	2135.1	276.1	10.4	7.7	4.5	6.0	
NF	24.8	18.5	1389.1	45.2	3.9	1739.4	269.5	11.5	6.5	3.8	6.8	
NF	25.7	18.0	1205.0	27.4	2.3	274.3		12.2		1.0		72
NF	25.7	18.0	1205.0	21.8	2.4	264.6		9.2		1.2		
NF	25.7	18.0	1205.0	30.2	2.3	260.6		13.0		0.9		
NF	25.7	18.0	1205.0	31.3	2.9	294.9		11.0		0.9		
NF	25.7	18.0	1205.0	36.1	3.1	310.4		11.6		0.9		
NF	25.7	18.0	1205.0	40.1	3.3	293.2		12.1		0.7		
NF	25.7	18.0	1205.0	42.1	3.4	394.0		12.2		0.9		
NF	25.7	18.0	1205.0	40.5	3.3	384.8		12.2		1.0		
NF	25.7	18.0	1205.0	48.1	4.0	367.6		12.1		0.8		
NF	25.7	18.0	1205.0	68.9	5.2	588.7		13.4		0.9		
NF	25.7	18.0	1205.0	55.2	5.7	574.9		9.7		1.0		
NF	25.7	18.0	1205.0	75.5	6.0	616.8		12.5		0.8		
NF	25.2	18.3	1320.5	27.4		727.5				2.7		42
NF	25.2	18.3	1320.5	38.5		1003.3				2.6		
NF	25.2	18.3	1320.5	43.1		1158.8				2.7		
NF	25.2	18.3	1320.5	35.3		1189.5				3.4		
NF	25.7	18.4	1205.0	50.2	5.5	234.4	94.6	9.1	2.5	0.5	1.7	11
NF	25.7	18.4	1205.0	55.6	5.4	234.4	148.6	10.2	1.6	0.4	2.7	
NF	21.9	21.5	1557.0	21.8	1.2	338.8		18.0		1.6		136
NF	21.9	21.5	1557.0	31.6	1.9	687.3		16.3		2.2		
PF	31.6	9.0	850.0	21.2		417.6				2.0		205
PF	26.5	19.2	1628.0	21.4		731.9				3.4		168
NF	22.2	20.0	1350.0	32.1		824.8	41.6		19.8	2.6		25

NF	22.2	20.0	1350.0	55.6		1054.0	84.3		12.5	1.9		
NF	22.2	20.0	1350.0	31.1		234.2				0.8		134
NF	22.2	20.0	1350.0	61.2		295.6				0.5		
PF	22.1	21.0	1400.0	19.8	1.7	196.5	48.1	11.4	4.1	1.0	2.8	126
PF	22.1	21.0	1400.0	18.7	1.4	315.1	42.8	13.8	7.4	1.7	3.2	
PF	22.1	21.0	1400.0	15.7	1.1	186.2	37.1	14.7	5.0	1.2	3.5	
PF	22.1	21.1	1400.0	19.8	1.7	196.5	48.1	11.4	4.1	1.0	2.8	124
PF	22.1	21.1	1400.0	18.7	1.4	315.1	42.8	13.8	7.4	1.7	3.2	
PF	22.1	21.1	1400.0	15.7	1.1	186.2	37.1	14.7	5.0	1.2	3.5	
PF	22.2	21.1	1350.0	33.5	1.5	340.4	49.3	22.4	6.9	1.0	3.3	147
NF	30.8	15.6	1198.1	4.5	0.5	214.6	54.4	8.9	3.9	4.8	10.9	195
NF	30.8	15.6	1198.1	6.3	0.8	196.9	61.2	7.7	3.2	3.1	7.6	
NF	30.8	15.6	1198.1	12.0	1.5	188.3	79.6	8.0	2.4	1.6	5.3	
NF	30.8	15.6	1198.1	11.3	1.3	316.4	97.8	8.7	3.2	2.8	7.6	
NF	30.8	15.6	1198.1	10.6	1.4	501.3	117.6	7.4	4.3	4.7	8.2	
NF	30.8	15.6	1198.1	26.1	2.4	689.7	158.9	10.8	4.3	2.6	6.6	
NF	30.7	16.0	1350.0	15.5	1.2	317.0		12.6		2.0		148
NF	30.7	16.0	1350.0	12.0	0.8	262.3		16.1		2.2		
PF	30.7	16.0	1350.0	11.5	0.8	259.0		15.3		2.3		
PF	26.8	20.0	1644.0	28.7	1.8	653.3		16.0		2.3		107
PF	26.8	20.0	1644.0	20.3	1.3	469.0		15.6		2.3		
PF	27.2	16.5	1300.0	11.4		246.4				2.2		118
NF	27.2	16.5	1300.0	20.2		467.1				2.3		
NF	27.2	16.5	1200.0	22.9	1.7	494.9	47.9	13.7	10.3	2.2	2.9	28
PF	27.2	16.5	1200.0	22.1	1.3	262.8	46.8	17.7	5.6	1.2	3.7	
PF	27.2	16.5	1200.0	15.5	1.1	244.4	40.1	14.6	6.1	1.6	3.8	
PF	26.7	18.6	1726.0	15.2	0.8	70.7		18.6		0.5		104
PF	26.7	18.6	1726.0	15.7	0.8	111.8		18.7		0.7		
PF	31.4	16.0	925.0	24.2	2.2	322.5	43.1	10.9	7.5	1.3	2.0	198
PF	31.4	16.0	925.0	23.0	2.1	270.2	38.2	10.8	7.1	1.2	1.8	

PF	32.9	14.6	1051.0	8.3	0.6	131.1		13.6		1.6		142
PF	32.9	14.6	1051.0	8.9	0.5	205.5		17.3		2.3		
PF	32.9	14.6	1051.0	9.9	0.7	214.3		15.1		2.2		
PF	32.9	14.6	1051.0	9.3	0.7	185.6		13.9		2.0		
PF	32.9	14.6	1051.0	8.4		126.2				1.5		141
PF	32.9	14.6	1051.0	8.8		190.7				2.2		
PF	32.9	14.6	1051.0	9.9		167.3				1.7		
PF	32.9	14.6	1051.0	9.3		155.3				1.7		
NF	30.9	15.3	1286.0	18.9	1.3	395.1		14.3		2.1		97
NF	30.7	16.0	1350.0	12.0	0.8	289.9	36.5	15.4	7.9	2.4	4.7	166
NF	29.9	16.2	1374.7	56.3		295.4				0.5		12
NF	29.9	16.2	1374.7	34.9		273.8				0.8		
NF	29.9	16.2	1374.7	18.7		222.9				1.2		
NF	29.9	16.2	1374.7	27.5		261.0				0.9		
PF	29.9	16.2	1374.7	22.5		211.9				0.9		
PF	29.9	16.2	1374.7	19.2		215.5				1.1		
PF	31.2	15.7	1094.0	14.9	1.7	224.9		8.9		1.5		38
PF	31.2	15.7	1094.0	11.8	2.4	195.5		4.9		1.7		
NF	27.1	19.4	1731.4	25.8		970.5				3.8		159
PF	27.0	18.7	1663.7	17.6		603.2				3.4		
PF	27.0	18.7	1663.7	21.9		571.6				2.6		
NF	27.0	18.7	1663.7	16.2		557.2				3.4		
PF	27.0	18.7	1663.7	16.3		440.2				2.7		
NF	25.7	18.0	1205.0	44.8	4.0	477.9	102.9	11.2	4.6	1.1	2.6	71
PF	27.0	18.7	1663.7	15.5		330.1				2.1		92
NF	27.0	18.7	1663.7	18.1		461.7				2.6		
PF	27.0	18.7	1663.7	18.9		451.2				2.4		
NF	21.9	21.5	1557.0	15.9	1.5	821.6		10.9		5.2		19
NF	27.6	17.7	1553.0	11.5		113.4				1.0		15
PF	27.6	17.7	1553.0	15.2		142.5				0.9		

PF	26.7	18.6	1460.0	21.7	1.1	412.5	82.4	19.0	5.0	1.9	7.2	57
PF	21.1	23.5	1885.0	8.2	0.6	335.5	27.7	14.1	12.1	4.1	4.8	33
PF	21.1	23.5	1885.0	8.4	0.7	354.5	31.2	12.7	11.4	4.2	4.7	
NF	21.1	23.5	1885.0	16.3	1.0	625.3	41.5	16.8	15.1	3.8	4.3	
PF	28.3	17.6	1794.0	5.1	0.6	202.3	33.8	9.0	6.0	3.9	5.9	80
PF	28.3	17.6	1794.0	4.9	0.6	192.2	18.3	8.2	10.5	3.9	3.1	
PF	28.3	17.6	1794.0	4.7	0.4	154.6	17.6	12.6	8.8	3.3	4.7	
PF	28.3	17.6	1794.0	3.5	0.4	199.0	26.3	8.3	7.6	5.6	6.2	
PF	28.3	17.6	1794.0	7.4	1.0	257.1	32.3	7.8	8.0	3.5	3.4	113
PF	28.3	17.6	1794.0	2.9	0.4	86.1	15.6	6.6	5.5	3.0	3.5	
PF	28.3	17.6	1794.0	9.1	1.0	266.1	31.6	9.0	8.4	2.9	3.1	
PF	26.7	18.6	1726.0	16.0	2.1	103.9	17.0	7.5	6.1	0.6	0.8	182
PF	26.7	18.6	1726.0	16.8	2.2	125.7	22.4	7.8	5.6	0.7	1.0	
PF	26.7	18.6	1726.0	16.8	1.8	130.5	19.0	9.5	6.9	0.8	1.1	
PF	26.7	18.6	1726.0	14.8	1.5	161.0	28.3	9.8	5.7	1.1	1.9	
PF	26.7	18.6	1726.0	21.7	2.8	164.3	31.6	7.6	5.2	0.8	1.1	
PF	26.7	18.6	1726.0	19.1	2.2	151.6	23.5	8.5	6.5	0.8	1.1	
PF	26.7	18.6	1726.0	12.2	2.3	140.7	27.9	5.4	5.1	1.2	1.2	
PF	26.7	18.6	1726.0	9.2	1.1	129.8	22.5	8.1	5.8	1.4	2.0	
PF	26.7	18.6	1726.0	17.1	1.7	161.6	26.4	9.9	6.1	0.9	1.5	
PF	26.7	18.6	1726.0	8.0	0.6	144.7	20.5	13.5	7.1	1.8	3.4	52
PF	26.7	18.6	1726.0	6.9	0.5	134.7	15.6	13.8	8.6	2.0	3.1	
PF	26.7	18.6	1726.0	9.5	0.7	193.2	30.3	13.4	6.4	2.0	4.3	
PF	26.7	18.6	1726.0	15.8	1.2	317.3	41.0	13.7	7.7	2.0	3.6	
PF	31.2	16.0	1000.0	14.9	1.7	216.9		8.9		1.5		128
PF	31.2	16.0	1000.0	11.8	1.5	183.0		8.1		1.6		
NF	27.7	18.0	3000.0	25.6	3.3	361.0	33.1	7.6	10.9	1.4	1.0	204
NF	27.7	12.0	2200.0	31.7	3.2	704.2	46.1	10.0	15.3	2.2	1.5	
NF	27.7	12.0	2200.0	42.3	3.8	893.4	127.4	11.1	7.0	2.1	3.4	
PF	28.4	17.2	1485.5	16.8	1.0	390.7	47.4	17.2	8.2	2.3	4.9	62

NF	28.4	17.2	1485.5	19.8	1.2	432.7	50.7	16.2	8.5	2.2	4.1	
NF	28.4	17.2	1485.5	20.3	1.5	541.8	83.6	14.0	6.5	2.7	5.8	
NF	28.4	17.2	1485.5	21.1	1.3	474.0	59.4	16.6	8.0	2.2	4.7	
NF	28.4	17.1	1485.5	22.1	1.2	500.8		17.9		2.3		181
PF	28.4	17.1	1485.5	16.2	1.0	328.9		15.9		2.0		
PF	28.4	17.1	1485.5	16.2	1.0	328.9		15.9		2.0		103
NF	28.4	17.1	1485.5	17.2	1.0	388.4		17.0		2.3		
NF	28.4	17.1	1485.5	19.1	1.3	458.7		15.1		2.4		
NF	28.4	17.1	1485.5	22.1	1.2	500.8		17.9		2.3		
PF	27.4	10.5	2000.5	11.6	1.3	117.3		8.9		1.0		29
PF	27.3	10.5	2000.5	10.0	1.2	126.8		8.2		1.3		
PF	27.3	10.5	2000.5	43.6	4.3	272.6		10.2		0.6		
NF	27.3	10.5	2000.5	181.8	9.1	348.8		19.9		0.2		
NF	27.2	10.5	2000.5	72.8	6.9	154.9		10.5		0.2		
NF	27.2	10.5	2000.5	43.7	2.7	101.1		16.2		0.2		
PF	28.1	17.1	1430.0	9.4	1.0	373.2	14.6	9.3	25.5	4.0	1.5	16
PF	28.1	17.1	1430.0	11.8	1.0	285.2	9.4	12.2	30.4	2.4	1.0	
NF	29.6	16.6	1750.0	26.7	2.0	569.4		13.4		2.1		155
NF	29.6	16.6	1750.0	27.5	2.2	555.8		12.3		2.0		
PF	27.7	17.5	1600.0	13.7	0.7	194.3	26.9	18.3	7.2	1.4	3.6	120
NF	27.7	17.5	1600.0	18.3	1.0	216.5	30.0	18.6	7.2	1.2	3.0	
PF	27.6	17.5	1600.0	11.3	0.6	129.0	19.4	18.1	6.7	1.1	3.1	
NF	24.6	20.9	1700.0	35.3	1.6	342.4	47.8	22.6	7.2	1.0	3.1	
PF	24.3	20.9	1700.0	15.7		274.9	43.7		6.3	1.7		
PF	24.1	20.9	1700.0	20.2	1.3	364.5	45.5	15.7	8.0	1.8	3.5	
NF	31.8	15.1	1100.0	33.4	2.0	374.1	39.8	16.7	9.4	1.1	2.0	
PF	31.9	15.1	1100.0	22.1	1.6	163.2	28.1	13.9	5.8	0.7	1.8	
NF	25.2	18.3	1320.5	22.0		529.8				2.4		93
PF	22.7	17.7	1547.6	13.8		373.0				2.7		4
PF	22.7	17.7	1547.6	15.0		127.3				0.8		

PF	22.7	17.7	1547.6	10.4		183.8				1.8		
NF	22.7	17.7	1547.6	9.6		77.7				0.8		
NF	28.3	15.3	1963.7	23.4	0.8	166.2	33.9	30.1	4.9	0.7	4.4	94
PF	29.3	15.3	1963.7	21.7	1.0	143.9	28.7	22.7	5.0	0.7	3.0	
NF	29.3	15.3	1963.7	24.3	0.9	152.4	22.4	27.2	6.8	0.6	2.5	
NF	29.3	15.3	1963.7	36.3	1.2	213.4	43.0	29.2	5.0	0.6	3.5	
NF	29.9	16.2	1374.7	34.2		1210.0				3.5		102
NF	29.9	16.2	1374.7	44.6		1870.0				4.2		
NF	29.9	16.2	1374.7	55.6		2150.0				3.9		
NF	24.8	15.7	964.3	43.2	1.9	566.1		22.8		1.3		180
PF	24.8	15.7	964.3	21.8	1.1	396.0		19.1		1.8		
NF	24.8	15.7	964.3	50.3	2.6	615.0		19.1		1.2		
NF	27.1	19.4	1731.0	28.0		973.0				3.5		17
NF	27.1	19.4	1731.0	14.3		490.6				3.4		
NF	27.1	19.4	1731.0	8.4		322.6				3.8		
NF	27.0	18.7	1670.0	14.5		354.8				2.4		123
NF	27.0	18.7	1670.0	23.2		321.3				1.4		
NF	27.0	18.7	1670.0	14.5		337.5				2.3		
NF	27.0	18.7	1670.0	43.2		549.3				1.3		
NF	27.0	18.7	1670.0	21.3		391.9				1.8		
NF	27.0	18.7	1670.0	19.1		312.0				1.6		
PF	27.1	16.6	1346.0	6.6		129.4				2.0		5
PF	25.9	16.5	1300.0	11.2	1.2	237.8	22.4	9.1	10.6	2.1	1.8	112
PF	25.9	16.5	1300.0	12.1	1.3	282.9	27.9	9.2	10.2	2.3	2.1	
PF	25.9	16.5	1300.0	13.2	1.4	298.1	30.1	9.3	9.9	2.3	2.1	
PF	25.9	16.5	1300.0	9.9	0.9	172.6	15.7	11.4	11.0	1.7	1.8	
PF	25.9	16.5	1300.0	10.5	1.1	209.5	25.0	9.9	8.4	2.0	2.4	
PF	25.9	16.5	1300.0	10.2	1.0	194.2	21.3	10.6	9.1	1.9	2.2	
NF	25.9	16.5	1300.0	14.3	1.6	368.2	39.6	8.7	9.3	2.6	2.4	
PF	30.3	15.6	1390.0	8.5		131.4				1.5		200

PF	30.3	15.6	1390.0	16.4	135.1	0.8
NF	30.3	15.6	1390.0	24.0	180.4	0.8

CZ: climate zones

FH: frigid highland zone

CT: cool temperate zone

WT: warm temperate zone

ST: subtropical / tropical zone

MR: management regimes

NF: natural forest

PF: planted forest

Lat. : latitude (°)

MAT: mean annual temperature (℃)

MAP: mean annual precipitation (mm)

C_{soil}: soil organic carbon (g kg^{-1})

N_{soil}: soil total nitrogen (g kg^{-1})

C_{mic}: microbial biomass carbon (mg kg^{-1})

N_{mic}: microbial biomass nitrogen (mg kg^{-1})

C_{soil}:N_{soil}: ratio of soil organic carbon to soil total nitrogen

C_{mic}:N_{mic}: ratio of soil microbial biomass carbon to microbial biomass nitrogen

C_{mic}/C_{soil}: ratio of soil microbial biomass carbon to soil organic carbon (%)

N_{mic}/N_{soil}: ratio of soil microbial nitrogen to soil total nitrogen (%)

Ref. : references (Refer to Supplementary material S2)

Supplementary material S1 A list of literature from which data are extracted.

1) An, Y.L. (2012) Impact of short term simulated nitrogen deposition on carbon and nitrogen dynamics of the in three types of forest soils in Changbai Mountain. Master Dissertation of Northeast Normal University.
2) Bai, A.Q., Fu, B.J., Qu, L.Y., Huang, Y.Y. & Wang, L.H. (2012) The characteristics of soil microbial communities at burned forest sites for the Great Xing'an Mountains. *Acta Ecologica Sinica*, **32**, 4762-4771.
3) Cao, Y.S., Fu, S.L., Zou, X.M., Cao, H.L., Shao, Y.H. & Zhou, L.X. (2010) Soil microbial community composition under Eucalyptus plantations of different age in Subtropical China. *European Journal of Soil Biology*, **46**, 128-135.
4) Chen, W., Meng, M., Li, J., Qiu, Q., Feng, X., Yang, B. & Xu, Y.M. (2013) Comparison of Soil Organic Carbon of Four Forests in Tropical Yunnan. *Journal of West China Forestry Science*, **42**, 79-85.
5) Chen, X.L. (2012) Effect of land use and landscape position on soil labile organic carbon in the hilly red-soil area of the mid-subtropical climatic zone. Master Dissertation of Sichuan Normal University.
6) Chen, X.L., Xi, J.J., Zheng, T., Wang, Y.P., Guang, Q.W., Wang, J. & Qiu, L. (2014) Influences of thinning on microbial biomass carbon and nitrogen and enzymatic activity of *Bischofia polycarpa* plantations. *China Forestry Science and Technology*, **28**, 59-63.
7) Chen, X.M., Li, Y.L., Mo, J.M., Otieno, D., Tenhunen, J., Yan, J.H., Liu, J.X. & Zhang, D.Q. (2012) Effects of nitrogen deposition on soil organic carbon fractions in the subtropical forest ecosystems of S China. *Journal of Plant Nutrition and Soil Science*, **175**, 947-953.
8) Chen, Z., Yin, H.J., Wei, Y.Y. & Liu, Q. (2010) Short-term effects of night warming and nitrogen addition on soil available nitrogen and microbial properties in subalpine coniferous forest, Western Sichuan, China *Chinese Journal of Plant Ecology*, **34**, 1254-1264.
9) Cheng, M., Cheng, Y. & An, S.S. (2010) Effects of cropland conversion on soil bicrobial biomass and enzymatic activities in the Loess Hilly Area of Ningxia. *China-Journal of Soil and Water Conservation*, **17**, 142-147.
10) Cheng, Y., An, S.S., Li, G.H. & Li, D.H. (2010) Soil nutrient and microbial biomass in the Loess Hilly Area of Ningxia under different plant rehabilitation patterns. *Chinese Journal of Eco-Agriculture*, **18**, 261-266.
11) Cui, X.X., Luo, H.N., Yu, Y.C. & Shu, H.L. (2011) Soil microbiol biomass, respiration, and metabolic quotient under different vegetation restoration stages in karsts gorge district. *China-Journal of Soil and Water Conservation*, **25**, 117-120,139.
12) Dai, H. (2007) The characteristic of soil carbon pools among different land use types in Tiantong. Master Dissertation of East China Normal University.
13) Deng, H., Zhang, B., Yin, R., Wang, H.L., Mitchell, S.M., Griffiths, B.S. & Daniell, T.J. (2010) Long-term effect of re-vegetation on the microbial community of a severely eroded soil in sub-tropical China. *Plant and Soil*, **328**, 447-458.
14) Dong, L.L. & Zheng, F.L. (2009) Effects land-use types on soil microbial characteristics and carbon density in the loessial hilly-gully region. *Journal of Shaanxi Normal University (Natural Science Edition)*, **37**, 88-94.
15) Du, M.Y., Fan, S.H., Liu, G.l., Qi, L.H., Guo, B.H., Tang, X.L. & Xiao, F.M. (2013) Effects of land use change on soil labile organic carbon in Central Jiangxi of China. *Chinese Journal of Applied Ecology*, **24**, 2897-2904.
16) Duo, Y.F. (2012) The research on soil microbial biomass and diversity of 3 forest in subtropics. Master Dissertation of Central South University of Forestry and Technology.
17) Fan, Y.X., Yang, Y.C., Yang, Z.J., Xie, J.S., Chen, G.S., Zhong, X.J. & Guo, J.F. (2013) Seasonal dynamics and content of soil labile organic carbon of mid-subtropical evergreen broadleaved forest during natural succession. *Acta Ecologica Sinica*, **33**, 5751-5759.
18) Fan, G.K. (2008) Influence of regeneration patterns on the soil organic carbon quality and soil respiration of Chinese fir plantation. Master Dissertation of Fujian Agriculture and Forestry University.

19) Fang, L.N., Yang, X.D. & Du, J. (2011) Effects of land use pattern on soil microbial biomass carbon in Xishuangbanna. *Chinese Journal of Applied Ecology*, **22**, 837-844.
20) Fang, X.M., Wang, Q.L., Zhou, W.M., Zhao, W., Wei, Y.W., Niu, L.J. & Dai, L.M. (2014) Land use effects on soil organic carbon, microbial biomass and microbial activity in Changbai Mountains of Northeast China. *Chinese Geographical Science*, **24**, 297-306.
21) Feng, S.Z., Su, Y.R., Qin, X.M., Xiao, W., Ge, Y.H. & He, X.Y. (2013) Responses of soil microbial properties in soil profile to typical vegetation pattern and slope in Karst-cluster depression area. *Acta Ecologica Sinica*, **33**, 3148-3157.
22) Feng, W.T, Zou, X.M. & Schaefer, D.G. (2009) Above- and belowground carbon inputs affect seasonal variations of soil microbial biomass in a subtropical monsoon forest of southwest China. *Soil Biology & Biochemistry*, **41**, 978-983.
23) Gao, Q., Hasselquist, N.J., Palmroth, S., Zheng, Z.M. & You, W.H. (2014) Short-term response of soil respiration to nitrogen fertilization in a subtropical evergreen forest. *Soil Biology and Biochemistry*, **76**, 297-300.
24) Gong, W. (2006) Study on soil ecological characteristics after natural evergreen broadleaved forest artificial regeneration in Southern Sichuan Province. Doctoral Dissertation of Sichuan Agricultural University.
25) Guo, F.F., Li, Y.M., Li, Z.L. & Wang, Z.L. (2012) Effects of land use change on soil organic carbon and microbial biomass carbon and nitrogen in Naban River watershed, Yunnan Province of Southwest China. *Chinese Journal of Ecology*, **31**, 2473-2478.
26) Hao, J.R. (2010) Effect of harvest and land uses on soil microbial biomass carbon and nitrogen in natural secondary forest of Northeast China. Master Dissertation of Northeast Forestry University.
27) He, Y., Zhou, Y.G., Li, X.W., Miao, Y., Fan, C. & Chen, Y.L. (2013) Seasonal dynamics of soil microbial biomass carbon in *Alnus formosana* forest-grass compound models. *Scientia Silvae Sinicae*, **49**, 26-33.
28) He, Y.J., Wang, Q.K., Wang, S.L. & Yu, X.J. (2006) Characteristics of soil microbial biomass carbon and nitrogen and their relationships with soil nutrients in *Cunninghamia lanceolata* plantations. *Chinese Journal of Applied Ecology*, **17**, 2292-2296.
29) He, Z.X. & Zhu, F. (2011) Spatial distribution of soil nutrient and soil microbes along altitude gradient in the Xuefeng Mountain. *Chinese Agricultural Science Bulletin*, **27**, 73-78.
30) Hu, C.J., Fu, B.J., Jin, T.T. & Liu, G.H. (2009) Effects of vegetation on soil microbial biomass carbon and nitrogen in hilly areas of Loess Plateau. *Chinese Journal of Applied Ecology*, **20**, 45-50.
31) Hu, C.J., Fu, B.J., Liu, G.H., Jin, T.T. & Liu, Y. (2009) Soil microbial functional and diversity under typical woodlands in the hilly area of the Loess Plateau. *Acta Ecologica Sinica*, **29**, 727-733.
32) Hu, S., Zhang, Y., Shi, R.J., Han, S.Q., Li, H. & Xu, H. (2013) Temporal variations of soil microbial biomass and enzyme activities during the secondary succession of primary broadleaved-*Pinus koraiensis* forests in Changbai Mountains of Northeast China. *Chinese Journal of Applied Ecology*, **24**, 366-372.
33) Hu, Y.L. & Wu, X.F. (2002) Discussion on Siol microbial biomass as a bio-indicator of soil quality for Latosol Earth. *Journal of Zhejiang Forestry College*, **22**, 51-53.
34) Hu, Y.L., Zeng, D.H., Liu, Y.X., Zhang, Y.L., Chen, Z.H. & Wang, Z.Q. (2010) Responses of soil chemical and biological properties to nitrogen addition in a Dahurian larch plantation in Northeast China. *Plant and soil*, **333**, 81-92.
35) Hu, Z.D., Liu, S.R., Shi, Z.M., Liu, X.L. & He, F. (2012) Variations of soil nitrogen and microbial biomass carbon and nitrogen of *Quercus aquifolioides* forest at different attitudes in Balangshan, Sichuan. *Forest Research*, **25**, 261-268.
36) Hu, Z.L. (2009) The change of soil nutrients and microbial functions under different vegetation in Karst mountainous area, central Guizhou Province. Master Dissertation of Nanjing Agricultural University.

37) Huang, J.Y. & Song, C.C. (2010) Effects of land use on soil water soluble organic C and microbial biomass C concentrations in the Sanjiang Plain in Northeast China. *Acta Agriculturae Scandinavica Section B–Soil and Plant Science*, **60**, 182-188.
38) Huang, L.L. (2010) Soil respiration and microbial biomass carbon at different land uses. Master Dissertation of Nanjing Forestry University.
39) Huang, Y., Wang, S.L., Feng, Z.W., Gao, H., Wang, Q.K., Hu, Y.L. & Yan, S.K. (2004) Soil quality assessment of forest stand in different plantation esosystems. *Chinese Journal of Applied Ecology*, **15**, 2199-2205.
40) Huang, Y.Y., Qu, L.Y., Qu, X.C. & Du, S.Q. (2012) Soil microbial community characteristics under different vegetation types at the Holocene-basalt Platform，Jingpo Lake area, Northeast China. *Acta Ecologica Sinica*, **32**, 2827-2836.
41) Huang, Z.Q., Wan, X.H., He, Z.M., Yu, Z.P., Wang, M.H., Hu, Z.H. & Yang, Y.S. (2013) Soil microbial biomass, community composition and soil nitrogen cycling in relation to tree species in subtropical China. *Soil Biology and Biochemistry*, **62**, 68-75.
42) Huang, Z.S., Fu, Y.H. & Yu, L.F. (2012) Characteristics of soil microbial biomass carbon and soil water soluble organic carbon in the process of natural restoration of Karst forest. *Chinese Journal of Applied Ecology*, **23**, 2715-2720.
43) Jia, G.M., Cao, J., Wang, C.Y. & Wang, G. (2005) Microbial biomass and nutrients in soil at the different stages of secondary forest succession in Ziwulin, Northwest China. *Forest Ecology and Management*, **217**, 117-125.
44) Jia, G.M., Wang, C.Y., Cao, J. & Wang, G. (2007) Microbial biomass in soil during secondary succession in Ziwuling, Northweast, China. *Journal of Lanzhou University (Natural Science)*, **43**, 80-83.
45) Jia, W. (2014) Change regularity of soil microbial biomass C and N in man-made forest of *Pinus massoniana* at different ages. *Modern Agricultural Sciences and Technology*, 164-165,168.
46) Jiang, D.M., Li, M., Toshio, S. & Tang, Y. (2009) Effects of enclosure on vegetation characteristics and spatial heterogeneity of *caragana mirophylla* community in Horqin sandy land. *Chinese Journal of Ecology*, **28**, 2159-2164.
47) Jiang, F.Y., Sun, H., Lin, B. & Liu, Q. (2009) Dynamic changes of topsoil organic carbon subalpline in spruce plantation at different succession stages in Western Sichuan Province. *Chinese Journal of Applied Ecology*, **20**, 2581-2587.
48) Jiang, P.K. (2005) Soil active carbon pool under different types of vegetation. *Scientia Silvae Sinicae*, **41**, 10-13.
49) Jiang, Y.M., Pang, X.Y. & Bao, W.K. (2011) Soil microbial biomass and the influencing factors under *Pinus tabulaeformis* and *Picea asperata* plantations in the upper Minjiang River. *Acta Ecologica Sinica*, **31**, 801-811.
50) Jiang, Y.M., Chen, C.R., Liu, Y.Q. & Xu, Z.H. (2010) Soil soluble organic carbon and nitrogen pools under mono-and mixed species forest ecosystems in subtropical China. *Journal of Soils and Sediments*, **10**, 1071-1081.
51) Jiang, Y.M., Chen, C.G., Xu, Z.H. & Liu, Y.Q. (2012) Effects of single and mixed species forest ecosystems on diversity and function of soil microbial community in subtropical China. *Journal of Soils and Sediments*, **12**, 228-240.
52) Jiang, Y.M., Chen, C.L., Xu, Z.H., Liu, W.Q., Ouyang, Q. & Wang, F. (2010) Soil soluble organic matter, microbial biomass, and enzyme activities in forest plantations in degraded red soil region of Jiangxi Province, China. *Chinese Journal of Applied Ecology*, **21**, 2273-2278.
53) Kong, J.J. & Yang, J. (2014) Short- and long-term effects of fire on soil properties in a Dahurian larch forest in Great Xing'an Mountains. *Chinese Journal of Ecology*, **33**, 1445-1450.
54) Lai, J.M., Huang, C.D., Zhang, J. & Yang, W.Q. (2013) Effect of improvement measures on soil labile organic carbon of low-efficiency *Pinus massoniana* forest. *Forest Research*, **26**, 167-173.
55) Lan, C.J. (2013) The characteristic of surface soil organic carbon of different veretation types in area of West China.

Master Dissertation of Sichuan Agricultural University.

56) Li, H.S., Wang, J.S., Liu, X., Jiang, S.S., Zhang, C.Y. & Zhao, X.H. (2014) Effects and its sustained effect of simulated nitrogen deposition on soil respiration in *Pinus tabulaeformis* forests in the Taiyue Mountain, China. *Acta Scientiae Circumstantiae*, **34**, 238-249.

57) Li, J., Wei, X.H., Chai, H., Wang, R.M., Wang, D. & He, N.P. (2014) Impacts of land-use types on soil C mineralization and temperature sensitivity of forests in Qianyanzhou, Jiangxi Province, China. *Chinese Journal of Applied Ecology*, **25**, 1919-1926.

58) Li, J.J., Shi, F.C., Shibata, H. & Sasa, K. (2007) Soil organic carbon, total nitrogen and microbial properties under three secondary forests in Northeast China. *Acta Scientiarum Naturallum (Universitatis Nakaiensis)*, **40**, 84-91.

59) Li, L. (2004) Dynamics of soil microbial biomass in degraded forests. Master Dissertation of Fujian Agriculture and Forestry University.

60) Li, L., Zhang, Y., Wang, L.B. & Wang, L.M. (2007) Vertical changes of the soil microbial biomass and the correlation analysis in different forests. *Journal of Central South University of Forestry & Technology*, **27**, 52-56.

61) Li, L.Q., Wang, D., Liu, X.Y., Zhang, B., Liu, Y.Z., Xie, T., Du, Y.X. & Pan, G.X. (2014) Soil organic carbon fractions and microbial community and functions under changes in vegetation: a case of vegetation succession in Karst forest. *Environmental Earth Sciences*, **71**, 3727-3735.

62) Li, S.L., Fang, X., Xiang, W.H., Sun, W.J. & Zhang, S.J. (2014) Soil microbial biomass carbon and nitrogen concentrations in four subtropical forests in hilly region of Central Hunan Province, China. *Scientia Silvae Sinicae*, **50**, 8-16.

63) Li, X.A., Xiao, H.A., Wu, J.S., Su, Y.R., Huang, D.Y., Huang, M., Liu, S.L. & Peng, H.C. (2006) Effects of land use type on soil organic carbon, total nitrogen, and microbial biomass carbon and nitrogen contents in Karst region of South China. *Chinese Journal of Applied Ecology*, **17**, 1827-1831.

64) Li, Y.F., Zhang, J.J., Chang, S.X., Jiang, P.K., Zhou, G.M., Shen, Z.M., Wu, J.S., Lin, L., Wang, Z.S. & Shen, M.C. (2014) Converting native shrub forests to Chinese chestnut plantations and subsequent intensive management affected soil C and N pools. *Forest Ecology and Management*, **312**, 161-169.

65) Li, Y.H. (2009) Effect of harvest and land uses on soil labile organc carbon in natural second growth of Northeast China. Master Dissertation of Northeast Forestry University.

66) Li, Y.L., Yang, F.F., Ou, Y.X., Zhang, D.Q., Liu, J.X., Chu, G.W., Zhang, Y.R., Otieno, D. & Zhou, G.Y. (2013) Changes in forest soil properties in different successional stages in lower tropical China. *PloS one*, **8**, e81359, doi: 10.1371/journal.pone.0081359.

67) Li, Y.W. (2006) Seasonal dynamics of soil labile organic carbon under secondary vegetation. Master Dissertation of Chinese Academy of Sciences.

68) Li, Z.P., Wu, X.C. & Chen, B.Y. (2007) Changes in transformation of soil organic carbon and functional diversity of soil microbial community under different land use patterns. *Scientia Agricultura Sinica*, **40**, 1712-1721.

69) Li, Z.X., Liu, W.Y., Chen, L. & Sun, L. (2011) Physical and chemical properties and microbial biomass of canopy soil in the montane cloud forest in Ailao Mountains. *Journal of Mountain Science*, **29**, 26-32.

70) Liang, Y.M., He, X.Y., Su, Y.R., Wang, K.L. & Liang, S.C. (2010) Dynamic changes of soil microbial properties in Karast-cluster depression area during vegetation restoration. *Chinese Journal of Ecology*, **29**, 917-922.

71) Liao, H.K., Li, J. & Long, J. (2012) Effects of different land use patterns on soil nutrients and soil active organic carbon components in Karst Mountain Area. *Journal of Natural Resources*, **27**, 2081-2090.

72) Liao, H.K., Li, J. & Long, J. (2013) Effect of vegetation type and micro-habitat on soil active organic carbon and basal respiration in Karst dry and Hot Valley Region of Guizhou Province, China. *Chinese Journal of Soil Science*, **44**, 580-586.

73) Lin, B.Z. (2013) Carbon stock and SOC stability in soils of typical plantations in North China. Master Dissertation

of Liaoning University.

74) Liu, B.R. (2010) Changes in soil microbial biomass carbon and nitrogen under typical plant communies along an altitudinal gradient in east side of Helan Mountain. *Ecology and Environmental Sciences*, **19**, 883-888.

75) Liu, C, Liu, Y.K. & Jin, G.Z. (2014) Seasonal dynamics of soil microbial biomass in six forest types in Xiaoxing'an Mountains, China. *Acta Ecologica Sinica*, **34**, 451-459.

76) Liu, D., Huang, Y.M. & An, S.S. (2012) Changes in soil nitrogen and microbial activity during *Robinia pseudoacacia* recovery period in the Loess Hilly-Gully region. *Chinese Journal of Eco-Agriculture*, **20**, 322-329.

77) Liu, J., Sun, S.X., Wang, F.M., Zou, B. & Li, Z.A. (2010) Carbon stock and TOC stability in soil of four typical plantations in South China. *Journal of Tropical and Subtropical Botany*, **18**, 607-612.

78) Liu, L., Duan, Z.H., Xu, M.K., Hu, J.C., Wang, S.L., Hu, Z.G., Zhang, Q.R. & Wang, S.J. (2010) Effect of monospecific and mixed Cunninghamia lanceolata plantations on microbial community and two functional genes involved in nitrogen cycling. *Plant and soil*, **327**, 413-428.

79) Liu, M., Li, Z.P. & Zhang, T.L. (2009) Changes of microbial biomass and functional diversity in red soil under different land use types. *Soils*, **41**, 744-748.

80) Liu, M.Q., Hu, F., He, Y.Q. & Li, H.X. (2003) Seasonal dynamics of microbial biomass and its significance to indicate soil quality under different vegetations restored on degraded red soils. *Acta Pedologica Sinica*, **40**, 937-944.

81) Liu, S. & Wang., C.K. (2010) Spatio-temporal patterns of soil microbial biomass carbon and nitrogen in five temperate forest ecosystems. *Acta Ecologica Sinica*, **30**, 3135-3143.

82) Liu, S.J., Zhang, W., Wang, K.L., Shu, S.Y., He, X.Y., Yang, S. & Pang, F.J. (2011) Soil urease activity during different vegetation successions in Karst peak-cluster depression area of Northwest Guangxi，China. *Acta Ecologica Sinica*, **31**, 5789-5796.

83) Liu, Y.L. (2003) C reserves and various SOC fractions in natural and plantation forests of *Castanopsis kawakamii*. Master Dissertation of Fujian Agriculture and Forestry University.

84) Liu, Y.Q., Wang, F., Ke, G.Q., Wang, Y.Y., Guo, S.M. & Fan, C.F. (2011) Effects of converting cultivated land into forest land on the characteristics of soil organic carbon in limestone mountain area in Ruichang, Jiangxi. *Chinese Journal of Applied Ecology*, **22**, 885-890.

85) Liu, Z.F., Liu, G.H., Fu, B.J., Hu, H.F., Zheng, X.X. & Wu, Y.Q. (2007) Dynamics of soil microbial biomass C,N along restoration chronosequences in pine plantations. *Acta Ecologica Sinica*, **27**, 1011-1018.

86) Liu, Z.F., Liu, G.H., Fu, B.J., Wu, Y.Q., Hu, H.F. & Fu, S.L. (2010) Changes in the soil microbial community with a pine plantation restoration in a dry valley of the upper reaches of the Minjiang River, Southwest China. *Annals of the New York Academy of Sciences*, **1195**, E82-E95.

87) Lu, H., Cong, J., Xue, Y.D., Yang, J.Y., Chen, K.L., Li, D.Q. & Zhang, Y.G. (2014) Effects of elevation on surface layer soil active organic carbon content in Shennongjia Nature Reserve. *Scientia Silvae Sinicae*, **50**, 162-167.

88) Lu, X.Q., Toda, H., Ding, F.J., Fang, S.Z., Yang, W.X. & Xu, H.G. (2014) Effect of vegetation types on chemical and biological properties of soils of Karst ecosystems. *European Journal of Soil Biology*, **61**, 49-57.

89) Lu, Y., Hauang, C.D., Dong, G.M., Lan, L.D. & Wang, X. (2010) Soil organic carbon and microbial carbon dynamics of the clear-cut cryptomeria plantation. *Journal of Sichuan Forestry Science and Technology*, **31**, 35-40.

90) Ma, H.P., Guo, Q.Q., Liu, H.M. & Qian, D.F. (2013) Soil organic carbon pool at the Western side of the Sygera mountains, Southeast Tibet， China. *Acta Ecologica Sinica*, **33**, 3122-3128.

91) Ma, H.P., Guo, Q.Q., Liu, H.M. & Qian, D.F. (2013) Changes of soil organic carbon and total nitrogen at different altitudes in West Slope of Sejila Mountain of Tibet. *Forest Research*, **26**, 240-246.

92) Mao, Y.L., Yang, Y.S., Cui, J.C. & Wang, G.Q. (2008) Effects of land use on the distribution of soil active organic carbon. *Journal of Fujian College of Forestry*, **28**, 338-342.

93) Mo, B., Cao, J.H., Xu, X.M., Shen, H.G., Yang, H. & Li, X.F. (2006) Changes of soil active organic carbon under

different land use types in Karst area. *Ecology and Environment*, **15**, 1224-1230.

94) Ning, Y.J. (2013) Soil respiration in subtropical evergreen board-leaved forests with different human disturbances in Gutianshan, Zhejiang Province. Master Dissertation of Zhejiang Normal University.

95) Qin, J.H., Wang, Q. & Sun, H. (2013) Hanges of organic carbon and its labile fractions in topsoil with altitude in subalpine-alpine area of Southwestern China. *Acta Ecologica Sinica*, **33**, 5858-5864.

96) Qiu, L., Chen, X.L., Ding, H. & Guang, Q.W. (2013) Effects of thinning on soil microbial biomass carbon and nitrogen for *Platycladus orrientalis* plantation. *Journal of Jiangsu Forestry Science & Technology*, **40**, 14-19.

97) Shang, S.Y., Li, Y.F., Jiang, P.K., Zhou, G.M., Liu, J., Wu, J.S. & Lin, L. (2012) Effects of the conversion from native shrub forest to Chinese chestnut plantation on soil carbon and nitrogen pools. *Chinese Journal of Applied Ecology*, **23**, 659-665.

98) Sheng, H.Y., Li, S.L. & Cao, G.M. (2008) Effect of grazing on of alpine meadow dominated by *Potentilla froticosa* shrub on Qilian Mountain. *Ecology and Environment*, **17**, 2319-2324.

99) Shi, F.C., Li, J.J. & Wang, S.Q. (2008) Soil organic carbon, nitrogen and microbial properties in contrasting forest ecosystems of North-east China under different regeneration scenarios. *Acta Agriculturae Scandinavica Section B-Soil and Plant Science*, **58**, 1-10.

100) Shi, L. & Dai, W.H. (2009) Soil organic carbon and variation with land use in a Fluvo-Aquic soils from Northern Anhui. *Journal of Anhui Normal University (Natural Science)*, **31**, 585-589.

101) Song, M., Zou, D.S., Du, H., Peng, W.X., Zeng, F.P., Tan, Q.J. & Fan, F.J. (2013) Characteristics of soil microbial populations in depressions between Karst hills under different land use patterns. *Chinese Journal of Applied Ecology*, **24**, 2471-2478.

102) Sun, B.W., Yang, X.D., Zhang, Z.H., Ma, W.J., Ali, A., Huang, H.X. & Yan, E.R. (2013) Relationships between soil carbon pool and vegetation carbon return through succession of evergreen broad-leaved forests in Tiantong region, Zhejiang Province, Eastern China. *Chinese Journal of Plant Ecology*, **37**, 803-810.

103) Sun, W.J., Fang, X., Xiang, W.H., Zhang, S.J. & Li, S.L. (2013) Active pools of soil organic carbon in subtropical forests at different successional stages in Central Hunan, China. *Acta Ecologica Sinica*, **33**, 7765-7773.

104) Tan, G.X., Liu, Y.Q., Li, L.L., Liu, W., Zan, Y.T., Huo, B.N. & He, M.J. (2014) Effects of stand structure regulation on soil labile organic carbon in *Pinus elliottii* plantation. *Chinese Journal of Applied Ecology*, **25**, 1307-1312.

105) Tian, S.Y., Liu, Y.K., Wo, X.X., Li, Y.H. & Chen, Y. (2014) Organic carbon of soil in three original *Pinus koraiensis* forests in XiaoXing'an Mountains of northeastern China. *Journal of Beijing Forestry University*, **36**, 33-38.

106) Tian, Y., Haibara, K., Toda, H., Ding, F.J., Liu, Y.H. & Choi, D.S. (2008) Microbial biomass and activity along a natural pH gradient in forest soils in a karst region of the upper Yangtze River, China. *Journal of Forest Research*, **13**, 205-214.

107) Wan, X.H., Huang, Z.Q., He, Z.M., Hu, Z.H., Yu, Z.P., Wang, M.H., Yang, Y.S. & Fan, S.H. (2014) Effects of tree species transfer on soil dissolved organic matter pools in a reforested Chinese fir (*Cunninghamia lanceolata*) woodland. *Chinese Journal of Applied Ecology*, **25**, 12-18.

108) Wang, A. (2012) Effect of seasonal freeze-thaw on soil microbial and biochemical property in alpine forest soil. Doctoral Dissertation of Sichuan Agricultural University.

109) Wang, C.K. Unpublished data.

110) Wang, D., Geng, Z.Q., She, D., He, W.X. & Hou, L. (2014) Vertical distribution of soil active carbon and soil organic carbon storage under different forest types in the Qinling Mountains. *Chinese Journal of Applied Ecology*, **25**, 1569-1577.

111) Wang, G.B., Ruan, H.H., Tang, Y.F., Luan, Y.L., Chen, Y.Q. & Tao, Z.F. (2008) Seasonal fluctuation of soil microbial biomass carbon in secondary oak forest and *pinus taeda* plantation in north subtropical of China. *Chinese Journal of Applied Ecology*, **19**, 37-42.

112) Wang, H., Huang, Y., Wang, S.L. & Zou, D.S. (2009) Soil quality assessment under several typical ecosystems in mid-subtropical region: Effects of several typical ecosystems on soil properties. *Ecology and Environmental Sciences*, **18**, 1107-1111.
113) Wang, H.L., Bi, L.D. & Zhang, B. (2008) Change in microbial biomass and its controlling factors in degraded soil after reforestration of *pinus massoninana*. *Acta Pedologica Sinica*, **45**, 313-320.
114) Wang, H.Q., Guo, A.X. & Di, X.Y. (2011) Immediate changes in soil organic carbon and microbial biomass carbon after an experimental fire in Great Xing'an Mountains. *Journal of Northeast Forestry University*, **39**, 72-76.
115) Wang, J.C. (2010) Research of natural chinese pine forests soil microbial ecology in Loess Plateau. Master Dissertation of Shanxi Normal University.
116) Wang, Q.K. & Wang, S.L. (2006) Microbial biomass in subtropical forest soils: effect of conversion of natural secondary broad-leaved forest to *Cunninghamia lanceolata* plantation. *Journal of Forestry Research*, **17**, 197-200.
117) Wang, Q.K. & Wang, S.L. (2008) Soil microbial properties and nutrients in pure and mixed Chinese fir plantations. *Journal of Forestry Research*, **19**, 131-135.
118) Wang, Q.K., Wang, S.L. & Deng, S.J. (2005) Comparative study on active soil organic matter in Chinese fir plantation and native broad-leaved forest in subtropical China. *Journal of Forestry Research*, **16**, 23-26.
119) Wang, Q.K., Wang, S.L. & Feng, Z.W. (2006) Comparison of active soil organic carbon pool between Chinese fir plantations and evergreen broadleaved forests. *Journal of Beijing Forestry University*, **28**, 1-6.
120) Wang, Q.K., Fan, B. & Xu, G.B. (2009) Soil active organic matter in broadleaved forest and Chinese fir plantation in subtropical region of China. *Chinese Journal of Applied Ecology*, **20**, 1536-1542.
121) Wang, Q.K., Xiao, F.M., He, T.X. & Wang, S.L. (2013) Responses of labile soil organic carbon and enzyme activity in mineral soils to forest conversion in the subtropics. *Annals of forest science*, **70**, 579-587.
122) Wang, Q.K., Wang, S.L., Yu, X.J., Zhang, J. & Liu, Y.X. (2007) Soil carbon mineralization potential and its effect on soil active carbon in evergreen broad-leaved forest and Chinese fir plantation. *Chinese Journal of Ecology*, **26**, 1918-1923.
123) Wang, W. (2008) Seasonal dynamic of soil active organic carbon in mid-subtropical evergereen broadleaved. Master Dissertation of Fujian Normal University.
124) Wang, W.X. (2013) Characteristics of carbon and nitrogen in different species plantation ecosystems in southern subtropical area of China. Doctoral Dissertation of Chinese Academy of Forestry.
125) Wang, W.X., Zhou, J.B., Yan, D.Y. & Ma, Q.A. (2007) Contents of soil microbial biomass C, N and K_2SO_4-extractable organic C, N and their relations in different soil types on Loess Plateau of China. *China-Journal of Soil and Water Conservation*, **20**, 103-106.
126) Wang, W.X., Shi, Z.M., Luo, D., Liu, S.R. & Lu, L.H. (2013) Characteristics of soil microbial biomass and community composition in three types of plantations in southern subtropical area of China. *Chinese Journal of Applied Ecology*, **24**, 1784-1792.
127) Wang, W.X., Luo, D., Shi, Z.M., Li, D.S., Tang, J.C., Liu, S.R., Liu, Q.L. & He, J.S. (2014) Effects of afforestation on soil microbial community structure in the arid valley of Minjiang River. *Acta Ecologica Sinica*, **34**, 890-898.
128) Wang, Y., Ruan, H.H., Huang, L.L., Feng, Y.Q. & Qi, Y. (2010) Soil labile organic carbon of different land use types in a reclaimed land area of Taihu lake. *Chinese Journal of Ecology*, **29**, 741-748.
129) Wei, B., Jia, G.M., Yang, Z. & Li, J.Q. (2009) Dynamic change of microbial carbon in the process of spontaneous secovery of the abandonment of farmland in Southeast Hubei. *China-Journal of Soil and Water Conservation*, **16**, 159-161.
130) Wei, H.D. & Dong, B. (2013) Spatio-temporal dynamics of soil microbial biomass carbon in *Populus tremula* plantations in the Southeast of Shandong Province. *Ecology and Environmental Sciences*, **22**, 233-238.
131) Wei, T.F., Ren, R.L., Zeng, H. & He, J.S. (2009) Effects of throughfall manipulation on the dynamics of soil

microbial biomass carbon and microbial quotient in a *Pinus sylvetris* var. mongolica plantation. *Acta Scientiarum Naturalium Universitatis Pekinensis*, **45**, 533-540.

132) Wei, Y., Zhang, J.C., Yu, Y.C. & Yu, L.F. (2009) Changes of soil microbial biomass C and qSMBC during degraded Karst forest restoration in Guizhou Plateau. *Research of Agricultural Modernization*, **30**, 487-490.

133) Wu, W.H. (2010) The characteristic of soil organic carbon in moutain forests-dry Valley Ecotones. Master Dissertation of Sichuan Agricultural University.

134) Wu, X.K. (2013) Effects of land uses on soil labile organic carbon and soil water-stable aggregates in Naban river watershed. Master Dissertation of Yunnan Agricultural University.

135) Wu, Y.Q., Liu, G.H., Fu, B.J., Liu, Z.F. & Hu, H.F. (2006) Comparing soil CO_2 emission in pine plantation and oak shrub: dynamics and correlations. *Ecological research*, **21**, 840-848.

136) Wu, Y.X., Yang, X.D. & Yu, G.B. (2009) Seasonal fluctuation of soil microbial biomass carbon and its influence factors in two types of tropical rainforests. *Ecology and Environmental Sciences*, **18**, 658-663.

137) Xiang, Y.B., Hu, T.X., Zhang, J., Tu, L.H., Li, R.H., Luo, S.H., Huang, L.H. & Dai, H.Z. (2011) Study on soil respiration in Eucalyptus grandis plantations with different densities rainy area of Western China. *Journal of Natural Resources*, **26**, 79-88.

138) Xiao, F.P. & Huang, W.J. (2012) Soil carbon, nitrogen and microbial biomass dynamics of subalpine *Abies fabri* forest in Gongga Mountain, Southwest China. *African Journal of Microbiology Research*, **6**, 6091-6098.

139) Xiao, P., Li, Y.F., Jiang, P.K., Pan, R.J. & Wu, J.G. (2012) Effect of conversion from evergreen broad-leaved forest to *Phyllostachys violascens* cv. prevernalis forest on soil labile carbon and nitrogen pools. *Hubei Agricultural Sciences*, **51**, 4739-4744.

140) Xiao, Y. (2007) Effects of land use change on soil physicochemical properties and microorganism in subapline region of Western Sichuan. Master Dissertation of Hunan Agricultural University.

141) Xie, T. (2012) Variations of soil labile organic carbon in the poplar plantations of different ages in a coastal area of Northern Jiangsu. Master Dissertation of Nanjing Forestry University.

142) Xie, T., Zhen, A.B., Wang, G.B., Ruan, H.H., Xu, Y.M., Xu, C.B. & Ge, Z.W. (2012) Seasonal variation patterns of soil labile organic carbon in poplar plantations with different ages in Northern Jiangsu. *Chinese Journal of Ecology*, **31**, 1171-1178.

143) Xing, S.H., Chen, C.R., Zhou, B.Q., Zhang, H., Nang, Z.M. & Xu, Z.H. (2010) Soil soluble organic nitrogen and active microbial characteristics under adjacent coniferous and broadleaf plantation forests. *Journal of Soils and Sediments*, **10**, 748-757.

144) Xiong, Y.M., Xia, H.P., Li, Z.A., Cai, X.A. & Fu, S.L. (2008) Impacts of litter and understory removal on soil properties in a subtropical *Acacia mangium* plantation in China. *Plant and Soil*, **304**, 179-188.

145) Xu, G.P., He, C.X., Zhang, D.N., Zhao, Z.G., Lu, S.H., Yao, Y.F. & Huang, Y.Q. (2013) Soil microbial biomass and active characters under different land-use types in Karst mountain areas of Southwest Guangxi. *Guihaia*, **33**, 331-337.

146) Xu, H.Q., Zhang, J.E., Feng, L.F., Quan, G.M., Mao, D.J. & Qin, Z. (2009) Effects of land use patterns on microbial biomass carbon and nitrogen in Guangdong Province. *Acta Ecologica Sinica*, **29**, 4112-4118.

147) Xu, J. (2014) Response of soil carbon processes to throughfall exclusion in two subtropical plantations in Southern China. Doctoral Dissertation of Chinese Academy of Forestry.

148) Xu, Q.F. (2004) Study on labile organic carbon pool in forest soils. Doctoral Dissertation of Zhejiangn Uivrsity.

149) Xu, Q.F., Jiang, P.K. & Shen, Q. (2005) Comparison of organic carbon pool of soil in bush and broad-leaved forests. *Journal ofBeijing Forestry University*, **27**, 18-22.

150) Xu, X.K., Miao, H.Y. & Chen, Z. (2011) The vertical distribution and their relationship of dissolved organic carbon and exchangeable metals in Chinese old-growth forest soils. *African Journal of Agricultural Research*, **6**, 998-1008.

151) Xue, S., Liu, G.B., Dai, Q.H., Dang, X.H. & Zhou, P. (2007) Effect of different vegetation restoration models on soil microbial biomass in eroded hilly Loess Plateau. *Journal of Natural Resources*, **22**, 20-27.

152) Xue, S., Liu, G.B., Dai, Q.H., Li, X.L. & Wu, R.J. (2008) Dynamic changes of soil microbial biomass in the restoration process of shrub piantations in loess hilly area. *Chinese Journal of Applied Ecology*, **19**, 517-523.

153) Yang, C.D., Long, R.J., Chen, X.Q., Xu, C.L. & Xue, L. (2011) Seasonal dynamics in soil microbial biomass and enzymatic activities under different alpine brushlands of the Eastern Qilian Mountains. *Acta Prataculturae Sinica*, **20**, 135-142.

154) Yang, H.L. & Ren, J. (2012) Soil active organic carbon under different types of land use. *Shaanxi Forest Science and Technology*, 1-6,13.

155) Yang, J., Ke, L., Cui, J. & Xu, X.N. (2014) Effects of N and P addition on soil dissolved organic carbon and microbial biomass carbon in a subtropical evergreen broad-leaved forest. *Chinese Journal of Soil Science*, **45**, 876-883.

156) Yang, K., Zhu, J.J., Zhang, J.X. & Yan, Q.L. (2009) Seasonal dynamics of soil microbial biomass C and N in two larch plantation forests with different ages in Northeastern China. *Acta Ecologica Sinica*, **29**, 5500-5507.

157) Yang, K., Zhu, J.J., Yan, Q.L. & Zhang, J.X. (2012) Soil enzyme activities as potential indicators of soluble organic nitrogen pools in forest ecosystems of Northeast China. *Annals of forest science*, **69**, 795-803.

158) Yang, K., Zhu, J.J., Zhang, M., Yan, Q.L. & Sun, O.J.X. (2010) Soil microbial biomass carbon and nitrogen in forest ecosystems of Northeast China: a comparison between natural secondary forest and larch plantation. *Journal of Plant Ecology*, **3**, 175-182.

159) Yang, S.H. (2006) The effects of land use change on the soil organic carbon and the soil respiration. Master Dissertation of Fujian Agriculture and Forestry University.

160) Yang, X.T., Ning, G.H., Dong, H.Y. & Li, Y. (2006) Soil microbial characters under different vegetation communities in Taihang Mountain Area. *Chinese Journal of Applied Ecology*, **17**, 1761-1764.

161) Yang, Y.S., Guo, J.F., Chen, G.S., Yin, Y.F., Gao, R. & Lin, C.F. (2009) Effects of forest conversion on soil labile organic carbon fractions and aggregate stability in subtropical China. *Plant and Soil*, **323**, 153-162.

162) Yi, Z.G., Yi, W.M., Zhou, G.Y., Zhou, L.X., Zhang, D.Q. & Ding, M.M. (2003) Soil carbon effluxes of threemajor vegetation types in Dinghushan Biosphere Reserve. *Acta Ecologica Sinica*, **23**, 1673-1678.

163) Yin, R., Xu, Z.F., Wu, F.Z., Yang, W.Q., Xiong, L., Xiao, S., Ma, Z.L. & Li, Z.P. (2013) Seasonal dynamics of soil labile nitrogen pools and net nitrogen mineralization in subalpine forests along an elevational gradient in Western Sichuan，China. *Chinese Journal of Applied Ecology*, **24**, 3347-3353.

164) Yu, B.B., Jin, Z.X. & Li, J.N. (2008) Soil microbial biomass and enzyme activity of soils in different secondary succession stages of evergreen broad-leaved forest. *Journal of Northwest Forestry University*, **23**, 30-33.

165) Yu, Y., Du, H., Song, T.Q., Peng, W.X., Zeng, F.P., Wang, K.L., Lu, S.Y., Fang, F.J. & Lu, C.Y. (2013) Characteristics of soil fertility in different cosystems in depressions between Karst hills. *Acta Ecologica Sinica*, **33**, 7455-7466.

166) Yu, Y.W. & Xu, Q.F. (2003) Changes in soil microbial biomass by conversion natural masson pine into economic forests. *China-Journal of Soil and Water Conservation*, **17**, 103-105,113.

167) Yuan, B.C. & Yue, D.X. (2012) Soil microbial and enzymatic activities across a chronosequence of Chinese pine plantation development on the Loess Plateau of China. *Pedosphere*, **22**, 1-12.

168) Yuan, Y.H., Fan, H.B., Liu, W.F., Zhang, Z.W., Meng, Q.Y., Hu, F. & Li, H.X. (2012) Effects of nitrogen deposition on soil dissolved organic carbon and microbial biomass carbon in a Chinese fir plantation. *China-Journal of Soil and Water Conservation*, **26**, 138-143.

169) Yuan, Z. (2011) Response of soil organic matter fractions with different thinning intensity in subalpine. Master Dissertation of Sichuan Agricultural University.

170) Zeng, D.H., Hu, Y.L., Chang, S.X. & Fan, Z.P. (2009) Land cover change effects on soil chemical and biological properties after planting Mongolian pine (*Pinus sylvestris* var. mongolica) in sandy lands in Keerqin, Northeastern China. *Plant and Soil*, **317**, 121-133.
171) Zhang, D., Zhang, Y.X., Qu, L.Y., Ma, K.M. & Dai, S.D. (2012) Effects of slope position on soil microbial biomass of *Quercus liaotungensis* forest in Dongling Mountain. *Acta Ecologica Sinica*, **30**, 6412-6421.
172) Zhang, G.L. (2010) Changes of soil labile organic carbon in different land uses in Sanjiang Plain, Heilongjiang Province. *Chinese Geographical Science*, **20**, 139-143.
173) Zhang, H., Huang, Y.M., An, S.S. & Xing, X.Y. (2013) Soil active carbon with different plant communities on Loess Plateau. *China-Journal of Soil and Water Conservation*, **20**, 65-70.
174) Zhang, J., Wang, S.L., Feng, Z.W. & Wang, Q.K. (2009) Carbon mineralization of soils from native evergreen broadleaf forest and three plantations in mid-subtropic China. *Communications in soil science and plant analysis*, **40**, 1964-1982.
175) Zhang, J., Wang, S.L., Wang, Q.K. & Liu, Y.X. (2009) Content and seasonal change in soil labile organic carbon under different forest covers. *Chinese Journal of Eco-Agriculture*, **17**, 41-47.
176) Zhang, J., Wang, S.L., Feng, Z.W. & Wang, Q.K. (2009) Stability of soil organic carbon changes in successive rotations of Chinese fir (*Cunninghamia lanceolata* (Lamb.) Hook) plantations. *Journal of Environmental Sciences*, **21**, 352-359.
177) Zhang, J., Wang, S.L., Sui, Y.H. & Wang, Q.K. (2010) Stability of soil carbon pool under Chinese fir plantation ecosystems different in growing stage. *Journal of Ecology and Rural Environment*, **26**, 539-543.
178) Zhang, J., Gao, Y.H., Zhang, C., Zhou, B., Li, J.J., Yang, X.X., Xu, H. & Dai, J. (2013) Biological properties of lateritic red soil and their relationships with soil fertility in Southern China under different land use types. *Chinese Journal of Applied Ecology*, **24**, 3423-3430.
179) Zhang, J.B., Song, C.C. & Yang, W.Y. (2006) Land use effects on the distribution of labile organic carbon fractions through soil profiles. *Soil Science Society of America Journal*, **70**, 660-667.
180) Zhang, P.J. & Pang, G.X. (2010) Changes of soil microbial communities and activities along a vegetation succession in Karst soil: A case study of Stone Forest, Yunnan, China. *China-Geographical Research*, **29**, 223-234.
181) Zhang, S.J., Xiang, W.H., Sun, W.J. & Li, S.L. (2013) Effects of different land use types on soil organic carbon and microbial biomass carbon in the hilly area, central Hunan Province. *China-Journal of Soil and Water Conservation*, **27**, 222-227.
182) Zhang, S.Y., Yu, M.Q., Zhu, L. & Qin, X. L. (2010) A study on microbial biomass C，N characteristics in different rehabilitating forests on degraded red soil. *Acta Agriculturae Universitatis Jiangxiensis*, **32**, 101-107.
183) Zhang, X.Y., Guang, D.S., Li, H.S., Huang, K.Y. & Xu, Z.C. (2009) Allocation charactertics of organic carbon pool in typical forest soils Guangzhou. *Acta Scientiarum Naturalium Universitatis Sunyatseni*, **48**, 137-142.
184) Zhang, X.Y., Wang, W., Chen, W.L., Zhang, N.L. & Zeng, H. (2014) Comparison of seasonal soil microbial process in snow-covered temperate ecosystems of Northern China. PloS one, 9, e92985, doi: 10.1371/journal.pone.0092985.
185) Zhang, Y.G., Zhang, X.Q. & Xiao, Y. (2006) Effects of land ues change on soil organic and microbial biomass carbon in Miyaluo forest area. *Chinese Journal of Applied Ecology*, **17**, 2029-2033.
186) Zhang, Y.G., Su, X.J., Wang, M., Cong, J., Lu, H. & Liu, M.C. (2014) The characteristics of soil organic carbon and soil microbial community structure in two deciduous broadleaved forest types. *Chinese Journal of Soil Science*, **45**, 625-629.
187) Zhang, Y.Y., Qu, L.Y., Chen, L.D. & Wang, W. (2010) Soil microbial biomass properties under different vegetation types in Loess hilly region. *Chinese Journal of Applied Ecology*, **21**, 165-173.
188) Zhao, B., Sun, L., Hu, H.Q. & Sun, Z.H. (2011) Post-fire soil microbial biomass and nutrient content of *Larix gmelinii* forest in autumn. *Journal of Natural Resources*, **26**, 450-459.

189) Zhao, N. (2014) The components and influence mechanism of soil carbon flux under different land use types in hilly area of southern Taihang Mountains, China. Doctoral Dissertation of Chinese Academy of Forestry.
190) Zhao, N., Meng, P., Zhang, J.S., Lu, S. & Cheng, Z.Q. (2014) Soil quality assessment of *Robinia psedudoacia* plantations with various ages in the Grain-for-Green Program in hilly area of North China. *Chinese Journal of Applied Ecology*, **25**, 351-358.
191) Zhao, R.D., Fan, J.B., He, Y.Q., Sun, C.L., Tu, R.F. & Tan, B.C. (2011) Soil enzyme activities and microbial properties in *Pinus massoniana* plantations of different parent rock areas *Ecology and Environmental Sciences*, **20**, 253-258.
192) Zhao, R.D., Fan, J.B., He, Y.Q., Song, C.L., Tu, R.F. & Tan, B.C. (2012) Effects of plantation restoration approaches on soil enzyme activities and microbial properties in hilly red soil region. *Soils*, **44**, 576-580.
193) Zhao, T., Jiang, Y.X., Yan, H., Huang, Y.M. & An, S.S. (2013) Effects of different aspects on soil microbial biomass and dissolved organic carbon of the Loess Hilly Area. *Environmental Science*, **34**, 3223-3230.
194) Zhao, T., Yan, H., Jiang, Y.L., Huang, Y.M. & An, S.S. (2013) Effects of vegetation types on soil microbial biomass C, N, P on the Loess Hilly Area. *Acta Ecologica Sinica*, **33**, 5615-5622.
195) Zhao, Z.C., Xia, Z.Y., Xiong, S.Y., Wu, B. & Xu, W.N. (2013) Evolution of soil properties in vegetation restoration process on disturbed slopes. *Bulletin of Soil and Water Conservation*, **33**, 82-86.
196) Zheng, H., Ouyang, Z.Y., XK, Wang, M., H, Zhao, T.Q. & Peng, T.B. (2004) Effects of forest restoration types on soil quality in red soil eroded region, Southern China. *Acta Ecologica Sinica*, **24**, 1994-2002.
197) Zheng, H., Ouyang, Z.Y., Wang, X.K., Fang, Z.G., Zhao, T.Q. & Miao, H. (2005) Effects of regenerating forest cover on soil microbial communities: a case study in hilly red soil region, Southern China. *Forest Ecology and Management*, **217**, 244-254.
198) Zheng, P. (2013) Effect of vegetation restoration on soil fertility in Northern Sichuan Basin. Master Dissertation of Sichuan Agricultural University.
199) Zhou, C.A., Zhang, Y.G., Xiao, Y., Zhang, X.Q. & Li, D.Q. (2009) The effect of land use changes on soil active organic carbon pool in Miyaluo forest zone of Western Sichuan. *Acta Ecologica Sinica*, **29**, 4542-4547.
200) Zhou, C.L. (2009) A preliminary study on the characteristics of soil organic carbon pools under four forest types in mid-subtropics. Master Dissertation of Nanjing Agricultural University.
201) Zhou, C.N. & Ma, H.P. (2013) Distrabution of labile organic carbon in soil as affected by vegetation typical of Sygera Mountain, Tibet,China. *Acta Pedologica Sinica*, **50**, 1246-1251.
202) Zhou, G.M. & Jiang, P.K. (2005) Changes in active organic carbon of erosion red soil by vegetation recovery. *China-Journal of Soil and Water Conservation*, **18**, 68-70.
203) Zhou, L.X., Yi, W.M., Yi, Z.G., Li, Z.A. & Ding, M.M. (2004) Soil microbial characteristics in rehabilitation process of degraded ecosystems in Heshan. *Journal of Tropical and Subtropical Botany*, **12**, 202-206.
204) Zhou, Y., Xu, X.G., Wang, F., Ruan, H.H., Wang, J.S., Fang, Y.H., Wu, Y.Y. & Xu, Z.K. (2009) Soil microbial biomass respiration, and microbial quotient along an altitudinal gradient in Wuyi Mountain Southeastern China. *Chinese Journal of Ecology*, **28**, 265-269.
205) Zhou, Y.G., Hao, K.J., Li, X.W., Fan, C., Chen, Y.L., Liu, Y.K. & Wang, X. (2014) Effects of forest gap on seasonal dynamics of soil organic carbon and microbial biomass carbon in *Picea asperata* forest in Miyaluo of Western Sichuan, Southwest China. *Chinese Journal of Applied Ecology*, **25**, 2469-2476.
206) Zhu, H.H., He, X.Y., Wang, K.L., Su, Y.R. & Wu, J.S. (2012) Interactions of vegetation succession, soil bio-chemical properties and microbial communities in a Karst ecosystem. *European Journal of Soil Biology*, **51**, 1-7.
207) Zhu, Z.J., Jiang, P.K. & Xu, Q.F. (2006) Study on the active organic carbon in soil under different types of vegetation. *Forest Research*, **19**, 523-526.