

**Table S1.** Main parameters of i-Tree Eco input for this research (superscript: “a”, customized in this study; “b”, replaced with local parameter value via i-Tree Database).

Ecosystem service	Parameter	Value/ID/Monitor	Data Year	Reference
Carbon Storage/ Sequestration	Social cost of carbon <sup>a</sup>	96 US\$/ton carbon	2019	Japan Ministry of the Environment, 2019 [1]
Air Pollutant Removal	Leaf-on date <sup>b</sup>	April 4th	1981–2010	Japan Meteorological Agency, 2021 [2]
	Leaf-off date <sup>b</sup>	November 18th	1981–2010	Japan Meteorological Agency, 2021 [2]
	Upper air monitor ID <sup>a</sup>	47778: Shionomisaki	2015	Earth System Research Laboratory, 2020 [3]
	Solar radiation monitor ID <sup>a</sup>	26104060: Mibu	2015	National Institute for Environmental Studies, 2021 [4]
	Net radiation monitor ID <sup>a</sup>	28204150: Hamakoushien	2015	National Institute for Environmental Studies, 2021 [4]
	Precipitation monitor ID <sup>b</sup>	28214010: Yoriaihiroba	2015	National Institute for Environmental Studies, 2021 [4]
	CO concentration monitor ID <sup>b</sup>	26104510: Jihaioomiya	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26107510: Jihaiminami	2010–2015	National Institute for Environmental Studies, 2021 [4]
	NO <sub>2</sub> concentration monitor ID <sup>b</sup>	26101010: Kita	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26102510: Jihaikamigyoku	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26103010: Sakyoku	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104010: Kyoutoshiyakusho	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104060: Mibu	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104510: Jihaioomiya	2010–2015	National Institute for Environmental Studies, 2021 [4]
	O <sub>3</sub> concentration monitor ID <sup>b</sup>	26107510: Jihaiminami	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26101010: Kita	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26103010: Sakyoku	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104010: Kyoutoshiyakusho	2010–2015	National Institute for Environmental Studies, 2021 [4]
	PM <sub>2.5</sub> concentration monitor ID <sup>b</sup>	26104060: Mibu	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26102510: Jihaikamigyoku	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104010: Kyoutoshiyakusho	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104060: Mibu	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104510: Jihaioomiya	2010–2015	National Institute for Environmental Studies, 2021 [4]
	SO <sub>2</sub> concentration monitor ID <sup>b</sup>	26107510: Jihaiminami	2010–2015	National Institute for Environmental Studies, 2021 [4]
		26104060: Mibu	2010–2015	National Institute for Environmental Studies, 2021 [4]
Human health effects	Population <sup>b</sup>	1,474,735	2016	Kyoto City Statistics Portal, 2019 [5]
	Medical expense <sup>a</sup>	46% of the US	2018	OECD, 2021 [6]
	Household income <sup>a</sup>	65% of the US	-	OECD, 2021 [7]
	Value of a statistical life <sup>a</sup>	3,909,090.91 US\$	1991–2007	Miyazato, 2010 [8]
Avoided runoff	Surface weather <sup>b</sup>	477590: Kyoto	2015	National Centers for Environmental Information, 2021 [9]
	Precipitation <sup>b</sup>	28214010: Yoriaihiroba	2015	National Institute for Environmental Studies, 2021 [4]
	Impervious cover <sup>a</sup>	80.57%	2014–2016	JAXA, 2021 [10]
	Stormwater control cost <sup>a</sup>	7 US\$/m <sup>3</sup>	2007	Kawaguchi, et al., 2021 [11]

**Table S2.** Average values of ecosystem services of each land use at quadrat and single-tree level.

Scale	Land use	Carbon sequestration (kg)	NO2 removal (g)	O3 removal (g)	PM2.5 removal (g)	SO2 removal (g)	Runoff reduction (m <sup>3</sup> )
Quadrat level	ResLow	58.86	37.30	125.12	8.67	16.29	1.44
	ResHigh	63.89	43.05	145.62	10.20	18.90	1.70
	ResOther	53.87	64.47	208.21	13.69	27.42	2.28
	Ind	47.56	33.43	113.61	8.01	14.73	1.33
	ComNbr	48.53	33.80	112.92	7.78	14.72	1.30
	Com	32.36	14.61	52.78	4.00	6.72	0.67
Single-tree level	ResLow	5.16	3.27	10.98	0.76	1.43	0.13
	ResHigh	6.60	4.44	15.04	1.05	1.95	0.18
	ResOther	8.40	10.05	32.47	2.13	4.28	0.35
	Ind	8.16	5.74	19.50	1.37	2.53	0.23
	ComNbr	5.67	3.95	13.20	0.91	1.72	0.15
	Com	8.83	3.98	14.39	1.09	1.83	0.18

**Table S3.** Median values of ecosystem services of each land use at quadrat and single-tree level.

Scale	Land use	Carbon sequestration (kg)	NO2 removal (g)	O3 removal (g)	PM2.5 removal (g)	SO2 removal (g)	Runoff reduction (m <sup>3</sup> )
Quadrat level	ResLow	35.31	15.49	51.95	3.43	6.84	0.57
	ResHigh	22.88	17.92	54.38	3.24	7.31	0.54
	ResOther	20.83	12.76	40.77	2.54	5.39	0.42
	Ind	11.36	7.76	29.84	2.14	3.73	0.36
	ComNbr	19.66	6.00	19.61	1.31	2.57	0.22
	Com	12.78	2.54	8.65	0.61	1.12	0.10
Single-tree level	ResLow	2.45	1.13	3.66	0.26	0.47	0.04
	ResHigh	2.62	1.70	5.20	0.31	0.70	0.05
	ResOther	2.73	1.51	4.76	0.31	0.64	0.05
	Ind	4.31	1.85	5.99	0.38	0.78	0.06
	ComNbr	2.23	0.24	0.91	0.07	0.11	0.01
	Com	3.59	1.11	3.46	0.20	0.47	0.03

**Table S4.** Chi-square statistics of comparison of structure metrics across land use classes by Kruskal-Wallis rank sum test (the level of significance is denoted by asterisks: no asterisk,  $p \geq 0.05$ ; \*,  $p < 0.05$ ; \*\*,  $p < 0.01$ ; \*\*\*,  $p < 0.001$ ).

Scale	DBH	LAI	Number of trees
Quadrat level	11.99*	32.74***	30.20***
Single-tree level	19.20**	47.66***	-

## Reference

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