

Supplementary Materials:

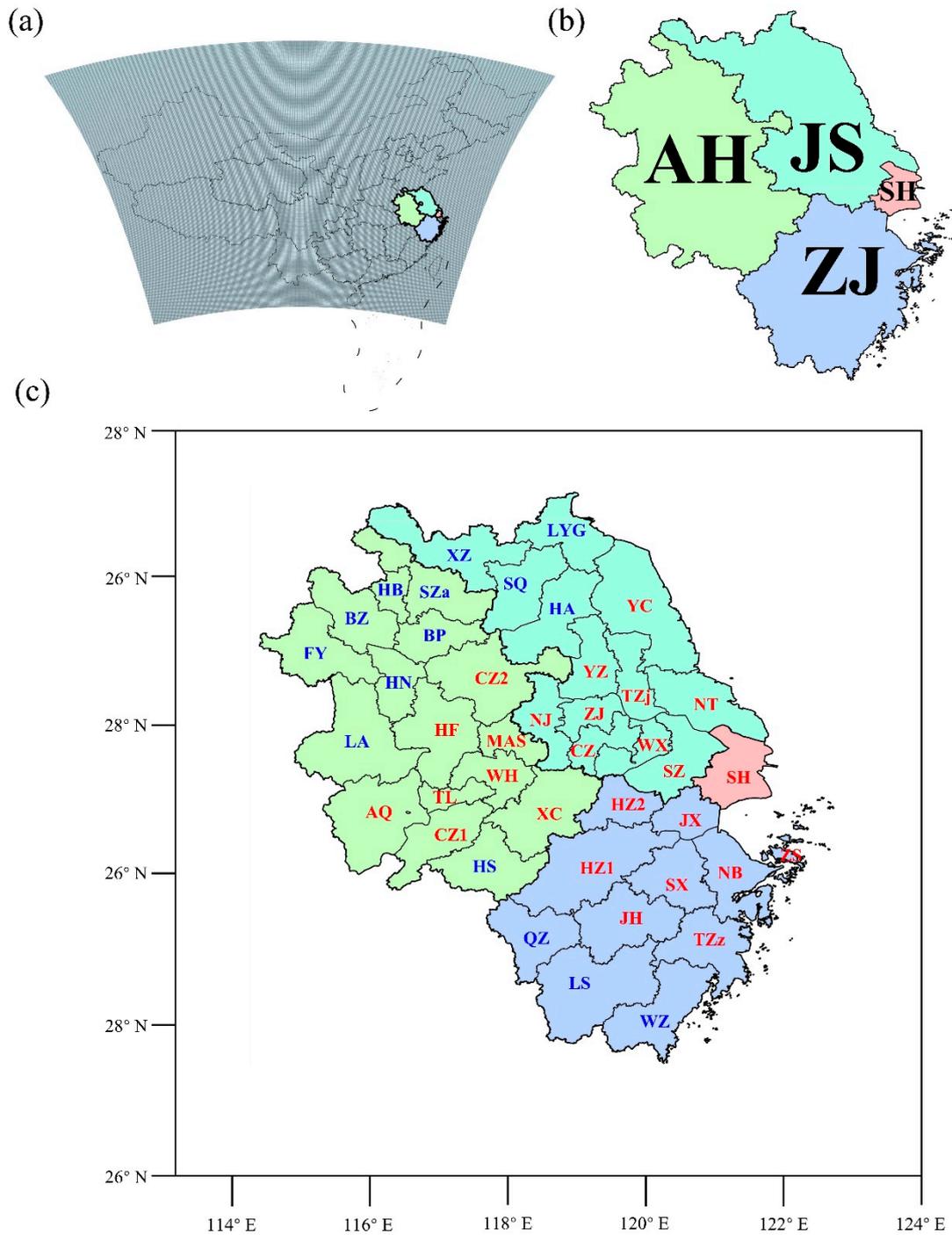


Figure S1. (a). The model domain covering China with a horizontal resolution of 12 km × 12 km and 345×395 grid cells. (b). The Yangtze River Delta region and districts of Shanghai (SH), Anhui (AH), Jiangsu (JS), and Zhejiang (ZJ). (c). Map of Yangtze River Delta region with marked location of each city (the cities of Yangtze River Delta urban agglomerations colored red, and other cities colored blue), and city names were listed in Table S3.

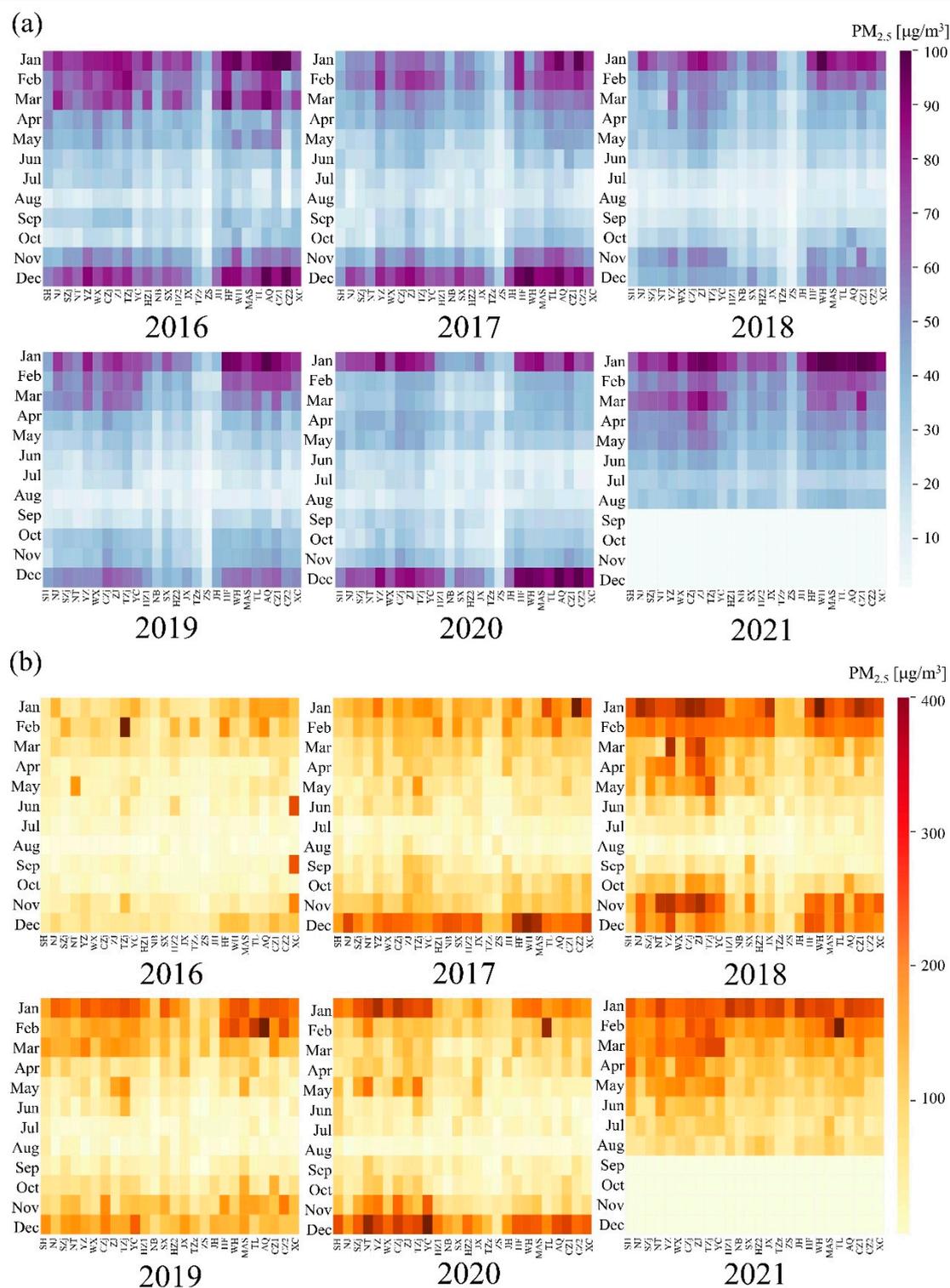


Figure S2. (a) Monthly mean concentrations of PM_{2.5} in Yangtze River Delta urban agglomerations (26 cities in Table S3) in recent 6 years. (b) Monthly maximum concentrations of PM_{2.5} in YRD urban agglomerations (26 cities in Table 1) in recent 6 years.

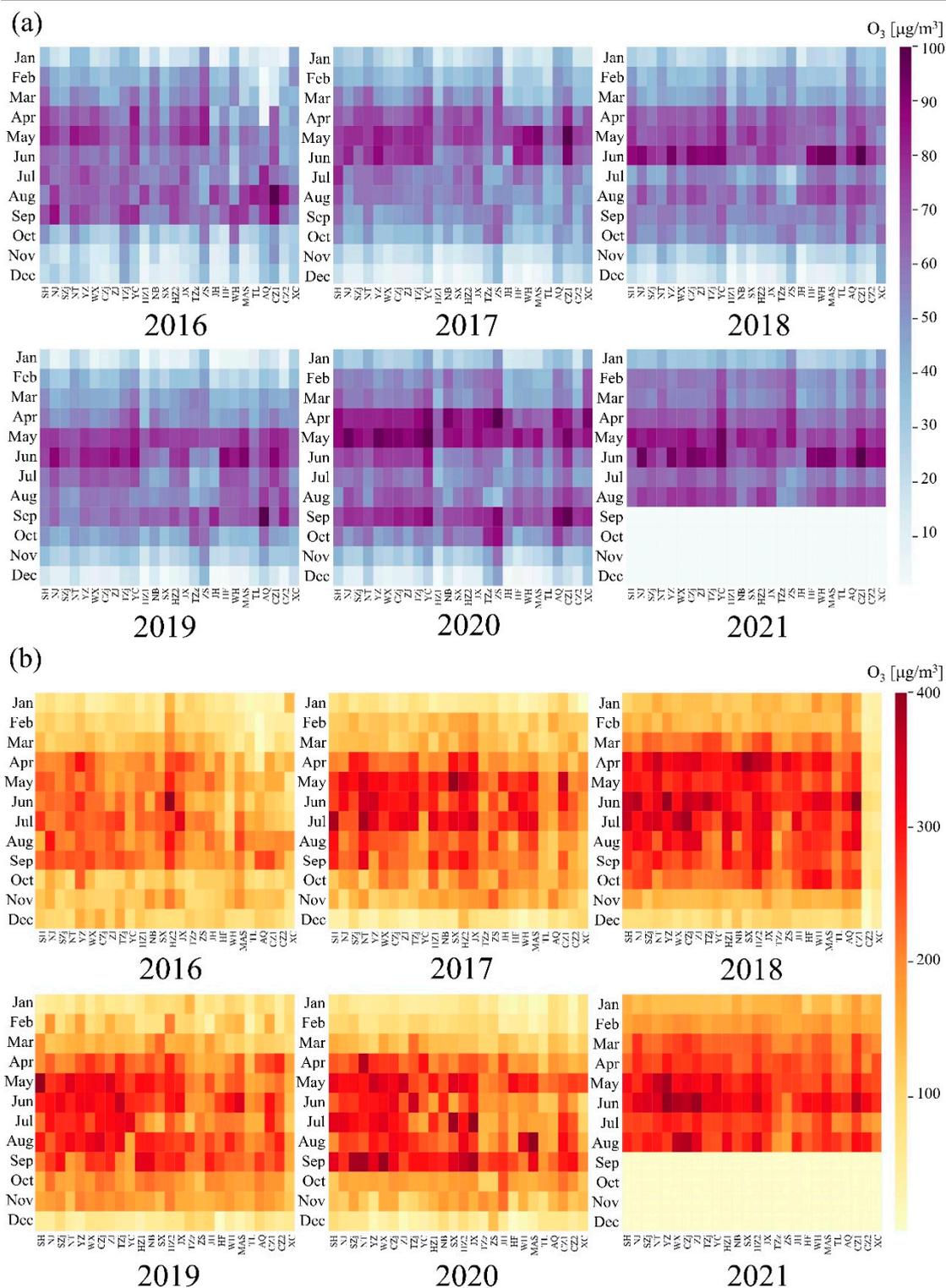


Figure S3. (a). Monthly mean concentrations of O₃ in Yangtze River Delta urban agglomerations (26 cities in Table S3) in recent 6 years. (b). Monthly maximum concentrations of O₃ in YRD urban agglomerations (26 cities in Table 1) in recent 6 years.

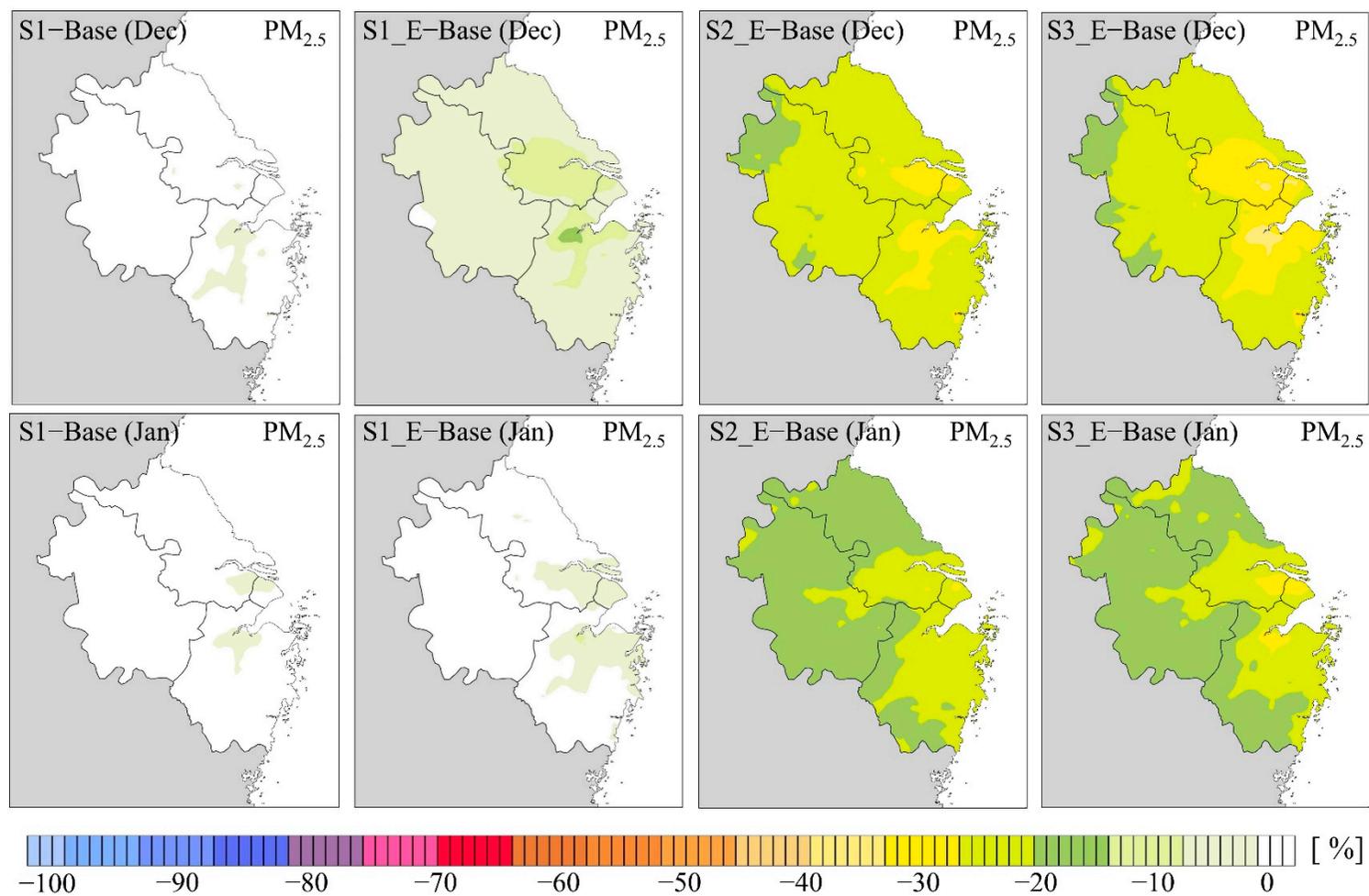


Figure S4. Spatial distributions of PM_{2.5} concentration decrease percentages under the four control scenarios relative to the baseline over the Yangtze River Delta region in January (Jan) and December (Dec), 2025.

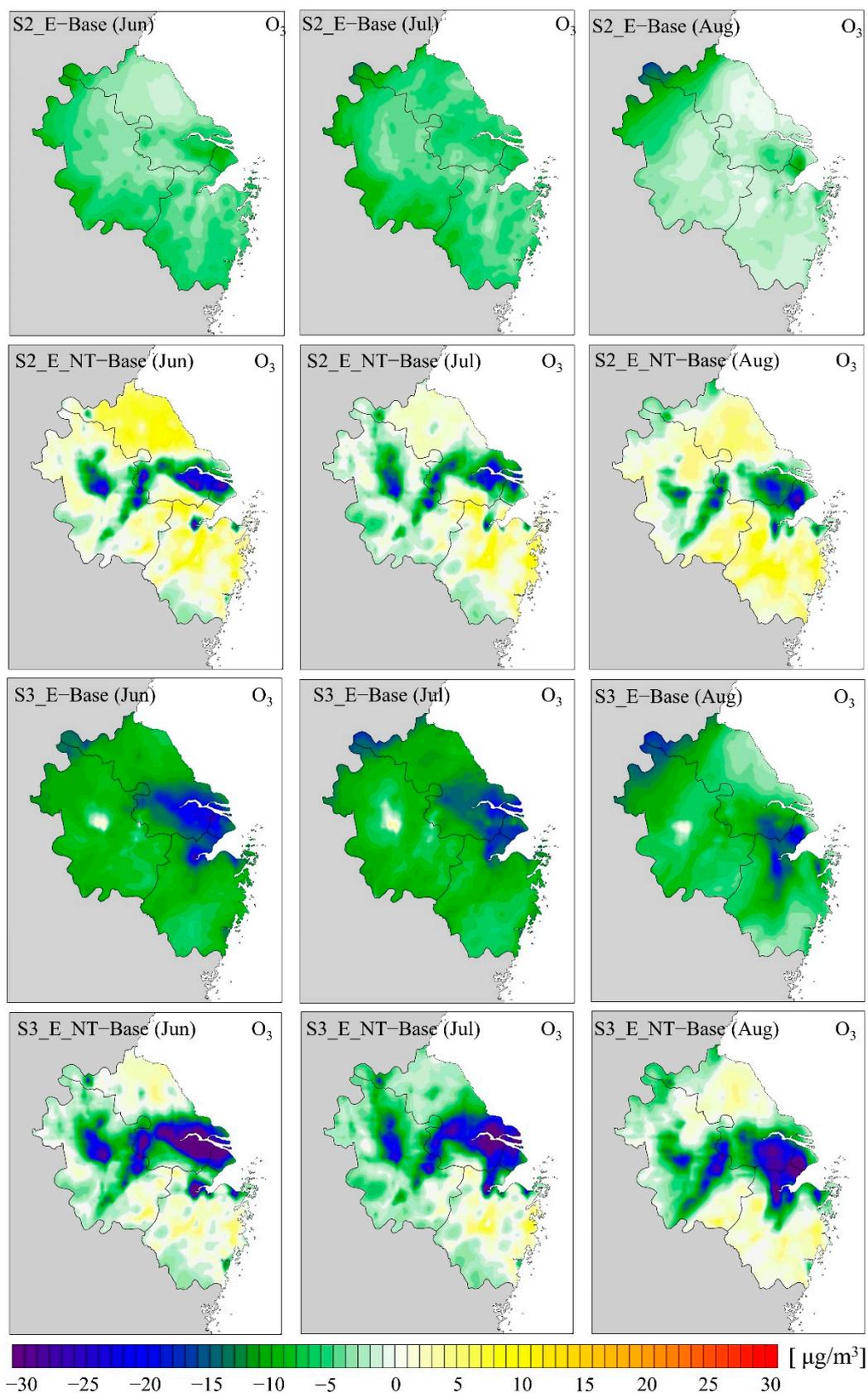
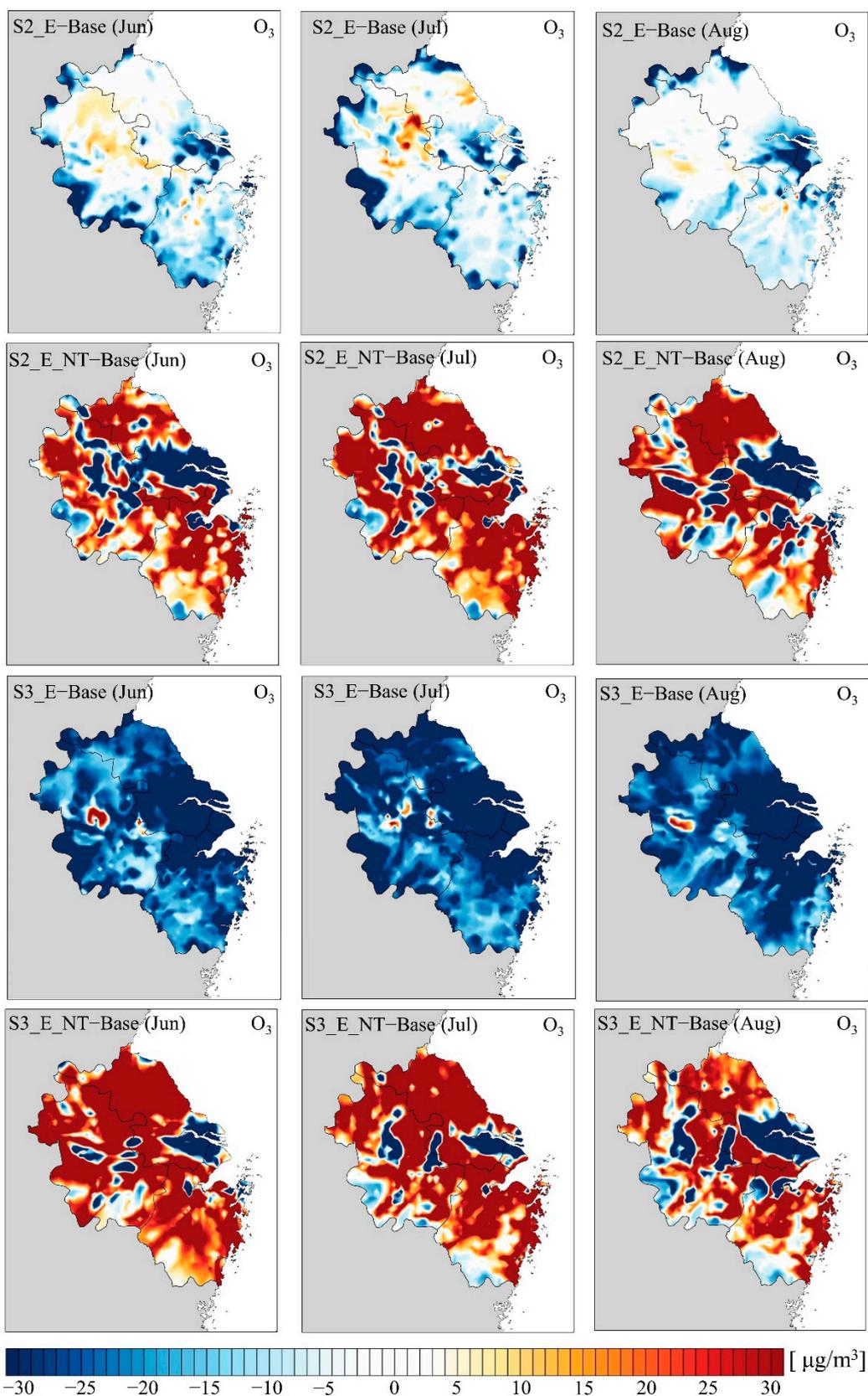




Figure S5. Spatial distributions of decrease values of monthly average O₃ concentrations under the four control scenarios relative to the baseline over the Yangtze River Delta region in June (Jun), July (Jul) and August (Aug), 2025.



	A	424345.9	12627.6	7497		46625.1	45168	12627.6	24842.4	7904.4
	H									
	JS	262821.3	7419.9	4417.3		27396.6	26540.4	7419.9	14597.2	4644.6
	ZJ	128142.3	3905.3	2321.7		14419.6	13969	3905.3	7683	2444.6
	S	13671	1389.6							
	H									
DOC	A	424345.9	54386.5							
B	H									
	JS	262821.3	29754.5							
	ZJ	128142.3	23002							
	S	13671	542.1	657.1		584.1	480.3	542.1	142.3	89.5
	H									
DOF	A	424345.9	11750.9	4458.3		12715.8	8306.8	11750.9	2744.7	3457.7
U	H									
	JS	262821.3	6775.1	2341.6		3738.4	1856.9	6775.1	313.3	337.5
	ZJ	128142.3	4981.7	2285.9		3656.6	2360.8	4981.7	663.9	699
	S	13671	10757.7							
	H									
DOS	A	424345.9	48536.6							
O	H									
	JS	262821.3	64194.7							
	ZJ	128142.3	58762.6							
	S	13671	15451.4		6345.3					
	H									
DOT	A	424345.9	15550.3		22526.6					
H	H									
	JS	262821.3	36881.9		24111.7					
	ZJ	128142.3	26337.9		22781.4					
	S	72682.3	10959.3	2638		2948.9	2825.9	9262.9	1340.5	504.7
	H									
INC	A	382328.8	33484.8	9824.2		74139.6	71362.3	23217	38178	12448.8
B	H									
	JS	644926	69967.8	23382.7		84140.5	79531.6	54285.6	41672.4	13652.1

	ZJ	287260. 8	43156.8	16904.7		62244.9	60053	34263. 1	31873. 7	10452. 2
OPE N	S H	13671	1540.9	824.3	16.8	2733.3	2254.4	141	901.7	91.1
	A H	424345. 9	91555.2	48977.6	888.3	162399. 5	133944. 9	8377.8	53573. 8	5413.3
	JS	262821. 3	79207.4	42372.2	710.5	140497. 2	115880. 2	7247.9	46348. 5	4683.3
	ZJ	128142. 3	25412.3	13594.4	271.1	45076	37178.1	2325.3	14870. 1	1502.5
PPC B	S H	35300	4031.6	21563.5		14148.7	8115	4031.6	503.4	230.5
	A H	208911. 5	62668.9	46321.7		136814. 8	84142.8	62668. 9	19770. 8	6664.5
	JS	337781. 8	89421.7	173146. 6		156878. 3	84799.3	89421. 7	4563.1	2179.6
	ZJ	258900. 9	30246.1	65180.3		66886.4	38093.9	30246. 1	3248.6	1274
PRC E	S H	72682.3	124.6	371.8		926.9	414.8	124.6	0.9	0.3
	A H	382328. 8	90941.6	191087. 8		65655.5	33605.4	90941. 6	561.2	187.1
	JS	644926	15209.1	47467		36200.7	16645.6	15209. 1	118.9	39.6
	ZJ	287260. 8	20154	48947.6		30387	14211	20154	130.1	43.4
PRIR	S H	72682.3	5922.2	8372.1		30278.6	21878.4	5922.2	1738.1	1198.7
	A H	382328. 8	37376.5	21110.9		84998.5	62222.5	37376. 5	5547.6	2902.6
	JS	644926	51894.8	46923.9		183452. 7	135107. 1	51894. 8	12227. 8	6592.6
	ZJ	287260. 8	12255.1	10798.7		41812.5	30685.8	12255. 1	2721.9	1519.7
PRO T	S H	72682.3	91769.7	9245.2	531.7	3349.6	2519.9	7548.3	47.6	58
	A H	382328. 8	206460. 2	61450.8	12262	40068.6	23248.6	69230. 9	4242.2	5012.6
	JS	644926	320645. 8	45305.4	13229.9	22280.7	12145.3	37957	1331	1598.1
	ZJ	287260. 8	216641. 1	42239.4	5376.9	16322	8907.1	35018. 8	596.3	597.3
PR O	S H	72682.3	292554. 5							

	A	382328.								
	H	8	270164							
	JS	644926		892063.						
	ZJ	287260.		4						
		8	824549							
TRO F	S	107616.								
	H	2	3299.5	6050.3		512.8	485.8	545.1	87.4	276.9
	A	394799.								
	H	8	64685.1	238490.		11569.9	10960.9	11034	1973	6247.7
	JS	833577.								
		5	50670.3	117078.		8225	7792.1	7427.4	1402.6	4441.5
	ZJ	685850.								
		8	29044.7	61461.4		4369.7	4139.7	4341.5	745.1	2359.6
TRO N	S	107616.								
	H	2	31646.9	100693.	1571.4	2982.7	2825.7	106.7	559	1546.8
	A	394799.								
	H	8	88384.2	236087.	3070.7	6542.7	6198.3	256.5	1265.3	3345.2
	JS	833577.								
		5	174998.	321798	6413.8	9191	8707.3	444.6	1862.9	4593.9
	ZJ	685850.								
		8	123033.	187056	6385.6	5367.9	5085.3	303.6	1124.1	2636.4
			1							

VOCs' totals in this table are estimated from a sum of individual VOC species.

Table S3. List of cities in YRD and the abbreviations of city name used in this study.

Province	City	City abbreviations
municipal	Shanghai	SH
Anhui	Anqing	AQ
	BengBu	BB
	Bozhou	BZ
	Chizhou	CZ1
	Chuzhou	CZ2
	Fuyang	FY
	Hefei	HF
	HuaiBei	HB
	Huainan	HN
	Huangshan	HS
	Luan	LA
	Maanshan	MAS
	Suzhou	SZa
	Tongling	TL
	Wuhu	WH
Xuancheng	XC	
Jiangsu	Changzhou	CZj
	Huaian	HA
	Lianyungang	LYG

	Nanjing	NJ
	Nantong	NT
	Suqian	SQ
	Suzhou	SZj
	Taizhou	TZj
	Wuxi	WX
	Xuzhou	XZ
	Yangzhou	YZ
	Yancheng	YC
	Zhenjiang	ZJ
Zhejiang	Hangzhou	HZ1
	Huzhou	HZ2
	Jiaxing	JX
	Jinhua	JH
	Lishui	LS
	Ningbo	NB
	Quzhou	QZ
	Shaoxing	SX
	Taizhou	TZz
	Wenzhou	WZ
	Zhoushan	ZS

Table S4. Predicted decrease values of PM_{2.5} concentrations under the four control scenarios relative to the baseline case in 41 main cities of YRD in December, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base
		Concentrations* ($\mu\text{g}/\text{m}^3$)	Reduction amounts* ($\mu\text{g}/\text{m}^3$)			
municipal	Shanghai	20.0±20.2	-0.6±2.3	-1.4±2.7	-3.1±3.8	-10.7±9.8
Anhui	Anqing	79.1±70.9	-0.7±2.0	-7.6±16.1	-13.5±12.5	-3.3±3.4
	Bengbu	52.4±49.1	-0.5±2.0	-0.5±1.4	-11.0±13.2	-14.0±13.6
	Bozhou	30.0±29.2	-0.6±0.8	-2.1±4.2	-13±13.5	-12.3±17.4
	Chizhou	13.0±13.2	-0.4±2.0	-5.7±13.2	-11.9±13.8	-19.0±18.7
	Chuzhou	66.1±64.0	-0.5±1.7	-3.3±7.0	-14.9±16.8	-12.0±16.1
	Fuyang	24.4±23.2	-0.3±1.3	-4.0±7.7	-9.1±8.1	-14.1±16.3
	Hefei	41.1±35.4	-1.7±3.8	-0.6±1.4	-13.1±13.3	-17.6±23.3
	Huaibei	15.1±14.8	-0.4±1.7	-2.9±6.6	-11.4±11.9	-14.0±14.4
	Huainan	13.4±17.3	-0.2±1.3	-0.5±1.0	-13.3±13.5	-3.5±4.4
	Huangshan	37.0±37.4	-0.3±1.1	-3.4±8.8	-13.7±13.5	-8.9±7.8
	Luan	46.3±51.9	-0.2±0.4	-1.1±2.2	-10.7±12.4	-8.7±8.1
	Maanshan	58.6±62.9	0.0±1.2	-6.1±11.8	-8.8±8.2	-12.5±15.1
	Suzhou	35.7±35.5	-0.3±1.0	-0.6±1.3	-8.0±9.1	-13±14.9
	Tongling	49.7±47.1	-0.4±1.3	-5.3±10.9	-8.9±9.2	-7.0±8.8
Wuhu	56.1±53.7	-1.1±2.1	-4.4±9.7	-3.6±4.2	-4.8±6.4	
Xuancheng	56.9±53.7	-0.6±2.2	-4.0±8.7	-10.9±12.3	-9.8±12.1	

Jiangsu	Changzhou	61.3±62.2	-0.9±2.5	-5.3±9.6	-10.5±13	-9.0±12.3
	Huai'an	56.2±52.2	-0.4±1.4	-4.0±11.0	-14.8±15.3	-11.8±14.7
	Lianyungang	49.1±52.9	-0.4±1.2	-3.0±7.9	-9.0±7.9	-3.7±4.6
	Nanjing	35.3±36.6	-0.3±0.5	-4.1±11.8	-14.0±13.6	-13.1±13.8
	Nantong	26.2±28.4	-0.2±0.4	-3.0±7.4	-13.0±13.2	-8.9±7.7
	Suqian	32.8±32.1	0.0±1.2	-3.6±8.1	-14.4±13.9	-11.3±15.7
	Suzhou	69.0±63.9	-0.2±0.3	-3.4±6.9	-17.3±16.1	-15.6±16.6
	Taizhou	56.1±52.7	-0.3±1.3	-3.3±7.5	-4.5±5.7	-13.1±15.2
	Wuxi	45.3±44.3	-1.2±2.2	-2.4±6.8	-2.6±3.7	-12.3±13.8
	Xuzhou	60.9±62.6	-0.7±1.9	-0.6±1.2	-8.7±8.5	-13.3±14.1
	Yangzhou	58.6±53.3	-0.2±0.4	-3.1±6.7	-3.9±4.6	-8.3±8.0
	Yancheng	23.6±24.8	-0.3±1.3	-3.1±7.6	-11.6±12.9	-2.6±4.0
Zhenjiang	58.4±53.4	-0.7±2.4	-5.4±11.2	-13±13.5	-3.1±4.1	
Zhejiang	Hangzhou	59.2±57.6	-0.5±1.6	-2.7±6.6	-8.2±8.1	-16.5±18.7
	Huzhou	56.4±54.9	-0.2±0.4	-2.9±7.1	-12.6±13.2	-8.8±9.5
	Jiaxing	45.6±42.3	-0.6±1.8	-3.6±10.4	-13±13.4	-3.3±3.7
	Jinhua	65.0±66.7	0.0±1.5	-2.0±4.8	-11.1±10.0	-12.7±13.9
	Lishui	14.8±14.7	-0.1±1.4	-2.1±4.1	-12.1±12.7	-14.3±15.6
	Ningbo	64.9±53.7	0.0±1.1	-5.8±12.1	-11.9±12.3	-16.0±17.0
	Quzhou	49.7±47.1	-0.5±1.3	-1.6±4.8	-3.3±3.2	-13.4±18.0
	Shaoxing	63.7±60.8	-0.2±1.4	-0.6±1.0	-13.3±14.0	-15.3±18.6
	Taizhou	42.6±48.6	-0.2±1.5	-4.8±13.9	-3.4±4.0	-13.7±16.4
	Wenzhou	62.2±60.5	-0.2±0.2	-2.0±3.3	-11.3±11.8	-11.2±11.8
Zhoushan	52.7±45.6	-0.2±1.4	-2.0±3.9	-6.6±7.7	-13.7±15.7	

Concentrations*: monthly mean concentrations ± standard deviation.

Reduction amounts*: monthly mean reduction amounts ± standard deviation.

Table S5. Predicted decrease values of PM_{2.5} concentrations under the four control scenarios relative to the baseline case in 41 main cities of YRD in January, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	
		Concentrations (µg/m ³)	Reduction amounts (µg/m ³)				
municipal	Shanghai	39.6±30.5	0.0±0.4	-0.7±2.3	-6.4±4.8	-7.5±7.0	
	Anqing	48.9±41.2	0.2±0.9	-0.6±2.8	-4.2±3.3	-12.5±17.6	
	Bengbu	24.3±15.8	-0.7±3.2	-0.5±2.5	-7.2±4.8	-9.1±10.5	
	Bozhou	54.3±48.1	0.2±0.5	-0.4±1.6	-8.1±6.3	-9.1±9.6	
	Chizhou	34.3±29.0	0.0±1.5	-0.5±0.9	-8.1±4.5	-7.4±4.8	
	Chuzhou	41.5±35.6	-0.1±0.2	-0.2±0.3	-9.7±9.5	-7.2±5.1	
	Fuyang	45.0±39.7	0.2±0.5	-0.2±0.6	-7.4±6.2	-5.8±4.8	
	Hefei	24.9±17.5	0.0±0.2	-0.9±3.4	-7.4±6.0	-8.3±6.0	
	Anhui	Huai'bei	54.2±45.8	0.0±0.3	-0.1±0.3	-6.9±6.0	-4.6±4.0
		Huainan	45.7±39.4	-0.1±0.3	-0.8±3.1	-6.1±5.1	-9.0±11.6
		Huangshan	39.5±37.4	0.2±0.8	0.0±0.2	-8.7±12.3	-5.2±3.9
		Luan	45.8±40.1	0.0±0.3	-0.5±0.6	-7.4±5.0	-8.0±6.0
		Maanshan	39.5±31.3	0.1±0.8	-1.8±4.5	-4.9±4.5	-9.1±15.4
		Suzhou	30.3±23.9	0.2±0.7	-3.5±12.9	-10.3±8.9	-7.4±5.5
		Tongling	52.9±46.7	0.1±0.3	0.0±0.4	-5.4±3.9	-9.7±11.7
		Wuhu	51.4±46.0	0.0±0.3	-0.1±0.5	-8.2±5.7	-8.0±5.6
	Xuancheng	43.1±38.3	0.2±0.6	0.0±0.4	-11.3±13.0	-5.5±4.1	
Jiangsu	Changzhou	53.1±46.4	0.2±0.9	-0.1±1.6	-11.1±10.1	-4.0±3.1	

	Huaian	41.2±34.4	0.0±0.5	-0.3±0.9	-8.5±8.1	-10.1±10.7
Lianyungang		33.6±23.3	0.0±0.4	-0.1±0.3	-5.2±4.0	-10.8±10.1
	Nanjing	43.1±40.5	-0.6±2.6	-0.8±7.1	-9.0±6.2	-7.3±6.8
	Nantong	43.7±36.3	-0.1±0.3	-0.3±0.6	-8.3±6.3	-9.5±11.5
	Suqian	44.2±40.8	0.3±0.9	-0.8±2.5	-9.4±9.5	-8.5±7.2
	Suzhou	49.6±44.8	-0.2±0.2	-0.1±0.2	-9.1±9.8	-6.0±4.1
	Taizhou	46.8±40.2	0.0±0.1	-0.4±1.6	-8.9±8.7	-9.0±6.6
	Wuxi	41.2±38.9	0.1±0.6	-0.1±0.5	-6.6±5.1	-7.2±5.2
	Xuzhou	48.1±46.7	0.1±1.6	0.0±0.4	-8.6±8.5	-8.8±8.9
	Yangzhou	35.7±28.8	-0.1±0.3	-3.5±11.4	-7.9±6.4	-12.6±15.1
	Yancheng	38.2±29.2	0.2±1.0	-0.3±0.8	-8.2±6.1	-12.9±18.7
	Zhenjiang	40.3±31.6	0.0±0.9	-0.8±1.3	-7.2±5.2	-6.6±5.2
	Hangzhou	54.4±47.8	0.0±0.3	-0.5±4.9	-10.2±8.1	-10.6±10.2
	Huzhou	54.3±48.1	0.1±0.7	-0.1±0.2	-7.3±4.8	-8.2±7.0
	Jiaxing	41.4±36.6	0.0±0.2	-1.1±6.8	-8.6±8.8	-4.6±3.8
	Jinhua	57.9±41.9	0.3±0.8	-0.7±3.9	-7.4±5.1	-12.0±12.5
	Lishui	24.4±17.6	0.0±0.2	-0.6±1.3	-4.7±3.9	-6.7±5.2
Zhejiang	Ningbo	29.5±23.7	0.1±0.8	-0.1±0.3	-12.1±12.2	-7.1±5.2
	Quzhou	39.8±32.8	0.0±0.5	-0.9±4.8	-8.1±6.2	-7.7±5.9
	Shaoxing	25.8±19.2	0.0±0.6	-0.2±0.4	-8.0±5.6	-8.2±4.7
	Taizhou	41.2±32.1	0.2±0.6	-0.1±0.1	-7.2±5.4	-7.8±6.1
	Wenzhou	45.3±36.7	0.0±0.2	-0.5±1.8	-6.0±4.0	-7.5±5.1
	Zhoushan	43.3±37.7	0.3±0.8	-0.7±4.3	-11.1±12.5	-7.8±7.3

Table S6. Predicted decrease values of O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in June, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	S2_E_NT – Base	S3_E_NT – Base
		Concentrations (µg/m ³)		Reduction amounts (µg/m ³)				
municipal	Shanghai	115.8±76.5	6.0±8.9	-0.3±8.3	-11.1±13.8	-11.8±13.2	-22.7±34.7	-32.7±33.5
	Anqing	99.8±72.5	9.6±18.7	2.8±10.2	-7.6±6.2	-12.7±9.1	-23.5±23.8	-5.5±22.3
	BengBu	104.7±78.2	8.0±12.6	-10.1±36.9	-9.4±7.0	-18.3±20.3	-2.4±12.6	-29.5±42.5
	Bozhou	108.9±75.0	5.9±13.0	0.8±9.2	-9.4±6.3	-12.2±16.9	-2.9±6.6	-39.9±42.4
	Chizhou	81.2±47.3	2.7±4.2	-1.2±11.3	-8.6±6.6	-13.4±17.6	-0.6±18.3	-39.2±43.2
	Chuzhou	100.1±46.3	3.1±6.2	2.9±8.6	-10.9±8.4	-11.2±12.0	-0.1±13.5	-3.8±12.3
	Fuyang	102.5±58.4	8.4±16.7	-10.3±17.0	-7.1±4.8	-15.5±20.7	-1.0±5.7	-36.2±44.0
	Hefei	119.3±56.1	8.3±18.3	3.6±7.1	-7.9±8.7	-11.9±11.0	-0.8±9.8	-8.2±19.5
Anhui	Huaibei	102.0±63.6	4.6±16.3	-5.2±22.5	-6.3±8.6	-16.6±9.8	-8.1±26.2	-5.3±16.7
	Huainan	100.1±57.4	4.3±13.2	-10.7±20.4	-9.9±7.4	-18.5±22.9	-4.3±12.1	-34±43.1
	Huangshan	74.6±59.8	8.7±11.1	-11.6±21.6	-8.2±7.8	-11.0±6.7	-24.7±31.6	-3.8±6.3
	Luan	88.0±48.1	10.8±16.7	-7.1±23.2	-6.6±5.8	-14.2±7.4	-8.6±18.1	-3.7±7.2
	Maanshan	91.5±45.2	9.6±18.7	3.5±5.1	-8.2±6.5	-13±11.2	-0.9±19.1	-5.9±27.7
	Suzhou	104.7±70.4	7.8±9.3	4.6±6.1	-5.5±6.6	-13.6±7.5	-3.1±29.3	-7.9±13.5
	Tongling	117.9±60.6	2.2±13.1	3.9±9.4	-7.8±6.9	-18.8±24.3	-25.4±32.8	-24.2±39.3
	Wuhu	110.2±49.9	11.2±20.2	3.6±9.3	-8.2±6.5	-16.8±19.8	0.0±15.5	-23.9±39.9
	Xuancheng	102.8±69.0	-2.1±12.9	-8.1±20.9	-5.7±5.9	-21±23.2	5.6±32.2	-25.7±48.4
	Changzhou	87.0±52.5	4.5±5.0	-14.4±26.3	-8.8±7.7	-11.6±7.9	-0.7±15.5	0.7±11.8
Jiangsu	Huaian	94.3±30.4	5.5±12.7	-12.7±22.2	-7.1±7.3	-16.5±20.4	-17.4±24.7	-35.8±46.2
	Lianyungang	112.7±52.4	8.7±11.4	-15.1±28.6	-10.9±9.9	-19.6±31.5	-0.5±14.6	-33.1±42.9
	Nanjing	118.0±55.3	3.6±15.1	1.4±7.9	-7.7±6.9	-8.9±5.7	-1.1±13.2	-2.1±5.5

	Nantong	101.4±80.7	7.6±10.2	-6±23.6	-7.7±6.7	-15.5±8.2	-28.4±31.7	-8.4±21.7
	Suqian	140.4±47.4	4±14.7	-5.9±27.1	-7.5±6.5	-14.3±12.8	-21.5±28.7	-20.3±28.8
	Suzhou	120.6±58.2	7.8±10.0	0.9±9.8	-4.9±5.3	-12.4±14.0	2.4±18.7	-21.6±37.2
	Taizhou	85.2±66.9	9.1±12.0	1.4±4.1	-9.9±7.8	-18.2±19.9	-3.6±12.1	-21.4±50
	Wuxi	121.8±50.9	6.7±8.3	-19.3±44.2	-8.5±8.6	-13.3±7.2	-20.0±37.4	-5.8±13.8
	Xuzhou	83.7±46.4	7.5±9.1	1.9±3.8	-8.9±12.9	-10.7±9.9	-10.9±48.5	-3.6±16.8
	Yangzhou	107.6±70.1	3.4±3.7	2.6±11.8	-7.0±5.7	-13.8±7.8	1.3±12.4	-7.6±13.5
	Yancheng	138.8±49.7	5.1±8.7	-8.5±24.7	-10.7±7.3	-17.2±22.7	-1.5±7.7	-16.8±41.4
	Zhenjiang	133.7±51.4	6.9±14.9	3.7±8.6	-7.2±7.8	-15.1±7.4	-13.3±29.5	-6.7±16.3
Zhejiang	Hangzhou	133.3±50.0	3.4±17.5	0.3±5.4	-7.4±5.5	-18.6±24.1	2.2±13.6	-41.8±52.7
	Huzhou	92.0±36.2	5.7±9.2	-1.6±9.4	-6.7±6.2	-12.2±7.3	-12.8±22.4	-1.2±14.0
	Jiaxing	103.9±41.5	5.5±7.9	-1.6±11.5	-4.1±5.0	-16.2±13.4	0.9±19.5	-5.3±34.8
	Jinhua	94.9±76.5	12.9±22.0	0.6±17.4	-7.1±7.7	-11.2±8.4	-8.7±32.5	-1.8±12.8
	Lishui	98.9±59.7	7.9±12.8	0.3±8.0	-7.4±7.9	-15.5±8.1	-9.1±35.8	-7.5±20.2
	Ningbo	73.6±27.8	-0.4±15.9	1.0±3.3	-8.3±7	-11.5±12.7	-27.6±32.9	-21.8±27.0
	Quzhou	108.2±64.2	7.0±6.5	-12.1±23.3	-7.4±6.8	-22.7±31.5	-14.8±29.3	-24.1±59.3
	Shaoxing	100.4±41.6	7.6±14.1	1.4±10.2	-4.6±5.8	-13.7±8.6	5.8±13.5	-6.3±17.4
	Taizhou	116.9±76.7	11.8±17.6	-10.6±18.1	-4.6±5.7	-11.2±9.7	2.2±22.4	-4.1±12.5
	Wenzhou	99.8±72.5	0.1±14.8	1.9±12.5	-7.0±6.3	-16.3±10.1	-12.2±27.6	-5.8±20.4
	Zhoushan	133.3±48.9	8.9±12.4	1.9±7.2	-6.9±6.5	-22.3±37.1	-0.7±17.1	-34.2±57.5

Table S7. Predicted decrease values of O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in July, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	S2_E_NT – Base	S3_E_NT – Base
		Concentrations (µg/m ³)	Reduction amounts (µg/m ³)					
municipal	Shanghai	96.1±41.8	7.8±17.1	0.8±11.3	-12.2±6.8	-18.1±21.7	-5.3±8.2	-10.0±48.0
Anhui	Anqing	133.7±63.0	2.4±3.2	-10.3±13	-9.9±11.7	-9.1±8.6	-6.2±21.6	-25.2±20.3
	BengBu	118.1±67.1	2.0±6.1	-7.2±18.5	-7.7±9.6	-15.1±7.6	-4.8±17.6	-8.4±12.1
	Bozhou	96.2±36.3	4.9±13.2	-1.4±8.9	-13.0±7.0	-14±16.8	-6.6±11.2	-6.9±33.6
	Chizhou	111.7±64.0	8.5±11.9	2.2±5.0	-6.9±4.5	-15.6±15.5	2.1±14.5	-38.0±40.4
	Chuzhou	153.5±72.2	7.9±12.8	-16.8±26.0	-10.8±10.8	-10.5±4.2	-23.5±28.6	-4.6±4.8
	Fuyang	114.9±68.8	8.1±18.8	0.2±6.9	-6.2±5.6	-14.5±11.7	0.7±27.8	-11.1±21.9
	Hefei	140.4±72.4	2.7±6.0	1.7±11.1	-14.3±7.7	-6.3±12.0	-6.3±7.0	-33±41.1
	HuaiBei	93.6±52.7	2.5±10.2	0.4±7.1	-13.5±7.3	-3.1±18.1	-6.0±9.6	-31.7±34.9
	Huainan	72.0±25.6	7.6±19.3	-10.3±19.8	-8.6±7.8	-17.1±12.7	4.6±18.5	-7.6±10.5
	Huangshan	90.2±50.9	4.3±12.1	-2.9±16.6	-8.5±11.3	-15.3±14.0	-7.7±19.5	-0.4±19.7
	Luan	116.9±59.9	3.4±17.3	0.6±5.3	-8.7±5.7	-14.5±9.8	-6.7±19.5	-7.9±10.7
	Maanshan	90.9±60.4	0.4±12.8	-6.3±11.7	-9.3±8.1	-10.9±13.5	-26.2±28.2	-9.7±19.6
	Suzhou	112.5±78.6	-8.2±13.4	1.0±4.9	-9.6±8.1	-13.5±6.8	-31.6±26.4	-5.9±7.4
	Tongling	141.5±65.9	6.1±11.0	1.6±4.4	-13.2±9.7	-15.2±12.8	-6.8±11.0	-4.0±14.8
	Wuhu	91.2±67.4	2.4±7.1	4.7±10.9	-8.2±11.4	-21.2±25.4	-6.2±20.6	-35.2±36.8
Xuancheng	108.6±69.7	4.1±11.8	0.1±13.0	-9.3±4.7	-14.4±14.3	-3.9±5.7	-13.9±27.5	
Jiangsu	Changzhou	123.5±70.6	7.2±12.7	2.6±10.2	-7.4±6.5	-13.7±10.6	0.0±20.4	-5.9±22.7
	Huaian	140.7±81.6	2.4±4.7	1.5±10.5	-9.0±6.7	-16.8±19.7	1.7±17.8	-47.9±42.6
	Lianyungang	117.3±58.4	-4.9±12.6	-2.6±12.6	-8.7±13.7	-15.9±12.3	1.3±17.7	-7.8±19.1
	Nanjing	71.1±44.3	4.9±11.7	0.6±18.7	-8.6±11.7	-14.8±7.4	-0.3±20.9	-7.1±9.6
	Nantong	118.8±54.7	4.9±13.9	-6.6±11.3	-8.2±4.6	-14.5±10.4	-0.1±9.1	-0.3±27
	Suqian	104.9±61.8	3.7±7.4	-7.9±15.6	-10.9±9.5	-15.6±7.5	-33.8±25.4	-7.2±6.2
	Suzhou	105.7±54.4	4.0±5.5	-15.7±19.4	-15.8±12.4	-16.7±15.2	-6.1±10.6	-13.8±25.1
	Taizhou	131.7±65.2	2.8±6.1	2.5±11.4	-8.6±7.5	-9.7±5.7	-28.1±33.1	0.1±14.5
	Wuxi	89.5±54.0	4.9±6.3	0.9±3.5	-8.0±9.0	-20.1±22.2	-14.8±24.3	-40±38.8
Xuzhou	99.1±54.1	11.9±17	-10.2±20.3	-9.8±5.3	-14.7±13.4	-1.9±9.8	-8.2±21.7	
Yangzhou	93.5±48.4	6.4±10.1	1.6±6.7	-7.4±8.3	-17.7±18.8	2.8±34.7	-6.7±46.0	

	Yancheng	115.1±64.9	6.1±22.0	1.2±2.5	-9.2±8.1	-12.3±5.0	-21.9±21.4	-3.1±9.0
	Zhenjiang	101.0±44.8	0.7±14.1	2.0±11.7	-6.7±4.1	-19.0±21.4	5.0±24.6	-36.7±41.4
Zhejiang	Hangzhou	86.9±62.6	-1.8±15.5	-0.7±11.5	-7.6±9.2	-13.4±9.6	-10.4±16.1	-1.1±17.0
	Huzhou	88.5±34.3	-5.3±12.0	1.8±12.0	-8.6±8.7	-13.8±14.4	-11.6±28.2	-10.6±24.9
	Jiaxing	117.9±85.1	0.6±8.7	0.7±6.4	-7.7±12.7	-10.7±13.3	-1.8±23.0	-20.2±30.0
	Jinhua	103.0±50.8	-7.4±15.9	4.3±11.2	-5.5±7.6	-19.3±19.4	3.7±38.5	-26.3±30.2
	Lishui	93.7±54.0	13.8±19.6	0.2±24.6	-7.6±10.5	-14.5±7.5	-26.5±31.2	-7.9±11.7
	Ningbo	123.4±72.5	9.3±13.9	1.9±22.7	-11.1±12.3	-7.1±13.1	-5.2±21.4	-37.5±29.9
	Quzhou	108.6±69.7	4.7±7.1	-0.1±6.8	-11.5±13.6	-15.3±11.8	-7.8±24.0	-9.6±20.8
	Shaoxing	96.8±58.1	8.4±13.9	-11.1±17.1	-7.8±6.6	-20.2±17.3	-17.2±26.9	-7.5±13.0
	Taizhou	144.7±70.6	3.0±7.2	0.5±10.8	-17.6±16.8	-11.8±6.8	-5.4±14.4	-2.1±8.4
	Wenzhou	93.9±63.7	2.7±9.5	1.4±10.0	-13.7±7.2	-15.4±12.4	-7.2±11.5	-14.8±19.1
	Zhoushan	91.2±60.1	3.0±7.7	1.6±7.5	-8.8±7.3	-8.4±11.8	-21.5±17.0	-13.0±15.0

Table S8. Predicted decrease values of O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in August, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	S2_E_NT – Base	S3_E_NT – Base
		Concentrations (µg/m ³)		Reduction amounts (µg/m ³)				
municipal	Shanghai	67.6±65.9	2.6±8.9	1.2±11.7	-7.3±13.1	-16.5±11.2	-35.0±48.5	-6.2±23.3
Anhui	Anqing	85.5±44.2	6.6±10.4	-34.5±60.3	-3.6±8.4	-12.3±19.2	-7.6±25.7	-32.6±42.3
	BengBu	59.9±25.3	15.0±23.0	0.6±4.2	-6.4±10.6	-11.2±17.4	-22.9±40.9	-31.7±37.2
	Bozhou	79.1±67.4	-1.0±12.5	-3.4±11.6	-4.2±6.3	-15.6±19.5	-11.4±26.7	-13.2±43.9
	Chizhou	88.7±49.0	0.1±2.3	-2.9±13.5	-1.8±6.9	-14.8±22.4	-1.6±4.3	-28.8±46.9
	Chuzhou	58.1±41.1	7.1±16	-14.9±21.9	-10±12.1	-27.9±52.1	1.3±21.1	-54.7±78.1
	Fuyang	88.6±59.4	5.2±5.6	1.8±9.3	-4.9±9.3	-13.7±19.6	5.0±20.0	-22.0±34.4
	Hefei	76.9±62.6	3.7±14.4	4.6±11.1	-4.5±10.9	-16.2±27.9	3.5±15.8	-36.4±48.7
	Huaibei	96.9±53.7	9.2±13.1	-7.6±20.3	-3.8±6.1	-19.0±13.4	-16.0±26.3	-5.6±20.7
	Huainan	53.2±45.4	6.7±10.8	-0.2±16.1	-4.2±4.3	-16.2±14.6	-8.4±16.7	-7.4±21.3
	Huangshan	63.6±46.0	5.0±23.4	0.8±10.3	-8.9±9.9	-6.1±13.9	3.5±21.3	-34.6±30.7
	Luan	83.1±52.0	6.2±16.1	-12.8±14.4	-10.5±14.7	-13.4±31.9	-0.6±21.5	-30.9±38.9
	Maanshan	73.9±48.9	9.1±24.3	2.9±10.1	-4.2±3.0	-8.1±11.1	3.7±8.0	0.9±14.8
	Suzhou	89.7±81.5	7.7±6.3	2.4±11.1	-4.9±7.1	-11.9±11.4	0.1±23.2	-3.3±26.1
	Tongling	61.9±54.4	6.3±14.8	-0.8±6.2	-2.7±4.8	-2.3±7.9	-8.9±21.5	-2.3±6.0
Wuhu	67.6±70.9	7.8±11.1	5.4±10.2	-5.1±5.7	-15.6±21.3	-21.9±22.3	-27.2±44.5	
Xuancheng	50.0±12.5	3.2±17.6	-0.7±10.8	-3.5±3.9	-14.1±20.6	5.3±9.1	-23.9±44	
Jiangsu	Changzhou	98.7±54.5	3.4±13.2	-9.9±14.5	-5.9±8.0	-4.7±5.6	-4.2±24.6	-0.8±9.5
	Huaiian	70.8±49.5	3.3±14.0	4.2±13.4	-2.2±7.0	-8.7±8.8	4.3±16.6	1.5±13.1
	Lianyungang	81.2±25.8	11.7±12.2	-2.6±10.8	-8.9±15.4	-17.1±12.2	-25.6±31.1	-6.8±23.6
	Nanjing	94.7±49.5	9.2±14.9	2.0±6.0	-4.8±6.0	-8.1±7.0	-20.9±26.6	-1.7±8.6
	Nantong	67.6±65.9	-2.8±11.3	1.8±12.3	-3.2±8.1	-12.6±19.3	-10.4±21.1	-33.4±43.3
	Suqian	134.2±56.5	11.5±14.6	-10.9±20.8	-4.5±6.6	-10.1±5.7	3.6±19.2	-0.6±9.7
	Suzhou	71.9±68.3	7.9±24.5	-7.1±16.1	-2.3±9.8	-10.0±8.9	2.1±37.0	-15.4±22.6
	Taizhou	126.5±61.4	10.7±13.2	-14.3±19.3	-3.8±7.3	-9.7±21.7	-9.7±28.5	-20.4±41.4
	Wuxi	81.8±30.7	11.0±14.1	-9.8±29.2	-2.6±4.5	-17.3±26.7	1.2±16.6	-30.0±45.0
	Xuzhou	65.9±50.5	11.0±20.4	2.5±9.7	-5.8±9.0	-10.5±9.2	-21.8±30.5	-15.4±21.1
	Yangzhou	81.5±54.4	10.0±19.1	-12.2±16.2	-1.9±2.9	-12.6±13.8	1.3±8.6	-14.9±30.8
	Yancheng	116.6±55.7	12.3±12.7	4.5±10.8	-3.7±3.9	-11.1±19.4	6.6±19.0	-27.9±44.8
	Zhenjiang	78.9±66.5	12.9±23.5	2.4±7.6	-2.7±6.5	-4.6±8.6	-24.4±21.8	-4.7±12.2
	Zhejiang	Hangzhou	105.6±57.2	5.4±14.8	2.6±6.0	-4.9±6.0	-6.3±8.0	-20.3±25.9

Huzhou	88.1±67.0	7.7±8.0	-10.8±19.4	-3.7±4.6	-8.1±12.7	-7.1±20.3	-3.5±23.6
Jiaxing	125.7±57.1	11.1±20.3	-1.9±21.9	-4.0±2.9	-7.8±10.9	1.3±6.4	-2.7±21.8
Jinhua	97.7±56.8	7.3±11.4	5.1±10.5	-4.3±4.4	-13.4±10.8	-7.8±15.3	-3.9±23.7
Lishui	42.3±26.9	3.1±15.6	-7.5±19.0	-4.7±6.4	-13.4±11.4	-14±27.6	-7.8±25.9
Ningbo	90.9±51.0	10.1±14.0	-16.9±31.2	-3.8±7.2	-16.3±10.5	-8.7±28.5	-2.9±23.1
Quzhou	90.3±67.5	9.8±13.0	-5.2±17.5	-13.3±14.9	-9.8±10.1	-0.1±20.1	-4.7±25.7
Shaoxing	85.5±69.0	7.7±18.4	-12.6±19.7	-4.7±5.8	-19.0±35.0	-18.8±23.5	-37.8±59.8
Taizhou	119.2±59.7	11.6±13.6	-18.9±27.4	-9.2±11	-9.4±8.7	2.4±20.5	-13.9±26.1
Wenzhou	63.3±32.1	5.1±8.0	-0.9±3.4	-1.8±4.7	-10.2±15.6	-1.1±12.1	-33.9±32.8
Zhoushan	72.2±34.2	3.7±7.9	0.9±6.5	-2.0±8.9	-6.9±12.6	3.2±21.8	-19.7±24.0

Table S9. Predicted decrease values of MDA8 O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in June, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	S2_E_NT – Base	S3_E_NT – Base	
		Concentrations (µg/m ³)	Reduction amounts – mean ± std (µg/m ³)						
municipal	Shanghai	104.3±64.1	28.1±19.7	3.3±15.9	-9.8±6.1	-16.2±7.5	12.3±16.9	5.4±10.3	
	Anqing	106.2±52.3	18.9±12.5	-1.2±13.1	-8.2±5.8	-23.3±9.3	1.6±44.8	9.0±10.7	
	BengBu	104.3±32.2	20.6±13.4	-16.3±28.0	-20.5±18.1	-20.8±10.3	-37.1±51.9	-12.8±23.5	
	Bozhou	110.5±67.6	30.6±16.6	7.5±14.4	-7.6±11.3	-15.9±4.9	1.8±23.5	4.5±9.6	
	Chizhou	80.3±46.1	14.1±11.1	-43±43.6	-7.1±5.8	-36.1±20.0	10.6±18.2	3.5±4.3	
	Chuzhou	113.2±46.1	13.6±9.5	-46.7±49.4	-6.0±6.8	-27.7±21.6	-11.4±25.1	2.1±10.4	
	Fuyang	112.1±53.6	14.0±11.4	-19.7±51.8	-5.4±8.0	-36.8±31.5	15.5±13.3	5.1±5.6	
	Hefei	106.2±60.8	11.3±5.9	3.6±9.5	-6.7±5.7	-19.0±4.3	-21.3±21.9	3.6±4.3	
	Huaibei	78.4±45.9	21.7±16.0	-70.6±56	-15.3±11.8	-40±26.4	4.3±14.2	11.6±6.8	
	Anhui	Huainan	75.8±40.0	29.1±15.7	-0.8±7.9	-8.2±7.5	-14.0±6.7	10.1±16.6	-5.2±27.6
		Huangshan	125.6±42.8	23.4±13.5	-17.8±40.8	-10.5±7.7	-18.3±14.6	0.9±16.3	-13±27.3
		Luan	129.5±48.9	5.2±7.1	-28.4±60.6	-3.3±4.3	-31±22.5	11.9±23.1	5.3±6.7
		Maanshan	108.6±71.4	26.3±16.3	-6.1±13.1	-5.3±4.9	-21.9±12.4	0.7±16.9	5.3±9.0
		Suzhou	104.2±47.7	19.6±11.0	7.4±11.1	-3.1±4.7	-18.1±6.8	16.3±16.9	-30.9±43.2
		Tongling	97.6±50.7	34.6±20.2	-4.9±15.1	-9.1±6.6	-17.4±6.9	-25.1±26.2	-5.5±29.0
	Jiangsu	Wuhu	94.5±69.5	18.0±13.1	-25.6±29.8	-10.3±9.7	-15.6±15.4	-26.4±51.1	-7.6±30.6
Xuancheng		99.2±65.2	12.0±11.5	0.7±20.2	-10.3±6.8	-19.5±6.7	-18.3±24.6	-17.1±26.1	
Changzhou		97.0±63.2	19.8±9.4	-4.1±18.5	-8.1±5.6	-20.5±9.2	10.8±12.8	-12.2±39.8	
Huaian		112.9±56.7	4.8±11.1	10.8±44.9	-10.2±8.7	-27.8±12.6	2.6±16.0	-14.1±48.6	
Lianyungang		115.2±51.2	13.1±10.6	-2.7±15.9	-9.2±8.9	-16.9±7.5	-26.2±36.4	12.8±7.5	

Nanjing	93.2±30.7	6.0±5.5	-45.9±37.1	-3.5±4.1	-24.1±16.0	13.4±17.0	-10.9±18.3	
Nantong	110.2±57.9	29.5±17.3	-29.7±58.7	-7.4±8.1	-38.8±21.2	-5.2±40.2	10.5±21.4	
Suqian	94.7±59.3	24.0±16.2	-57.4±73.4	-11.1±6.6	-52.0±46.7	0.2±8.2	12.4±10.5	
Suzhou	95.6±34.7	20.2±11.0	-30.3±77.3	-7.7±4.5	-43.1±38.1	1.4±6.7	-0.7±4.9	
Taizhou	104.1±69.0	27.7±20.3	3.1±9.6	-8.3±6.8	-22.4±7.3	-25.4±34.8	11.9±7.4	
Wuxi	106.4±63.5	11.1±13.9	-51.8±50.7	-12.7±7.9	-32.0±22.5	0.9±9.5	9.7±8.6	
Xuzhou	100.1±74.0	13.8±10.8	-0.2±6.6	-7.7±7.4	-10.8±5.8	-29.8±31.4	7.9±7.1	
Yangzhou	92.9±31.1	20.3±15.1	5.7±13.1	-8.0±5.9	-16.4±7.7	12.0±16.7	6.7±6.8	
Yancheng	127.9±46.7	14.4±10.5	-33.6±29.8	-10.1±5.2	-17.5±10.9	9.5±11.7	6.1±7.7	
Zhenjiang	76.7±32.2	17.4±12.3	-1.7±7.9	-11.2±7.9	-17.5±6.9	2.6±15.7	6.8±6.6	
Zhejiang	Hangzhou	71.6±23.4	17.1±12.0	5.6±18.4	-9.2±7.3	-20.2±8.4	-15.9±35.4	3.7±11.7
	Huzhou	93.9±32.7	24.9±16.0	-45.2±37.7	-4.8±7.3	-19.1±16.7	7.1±38.2	9.1±6.2
	Jiaxing	99.0±60.5	15.1±8.7	3.5±17.1	-9.8±6.2	-19.3±6.6	-35.5±32.2	-25.9±29.4
	Jinhua	83.1±60.5	18.1±13.9	-61.9±54.1	-13.3±7.2	-50.8±38.3	8.9±12.4	-9.3±19.7
	Lishui	112.8±72.5	7.9±13.9	-32.5±35.3	-7.1±4.7	-40.0±26.2	12.4±11.6	2.3±7.4
	Ningbo	81.2±33.2	13.0±8.1	1.5±11.6	-7.9±9.0	-19.2±9.8	-13.0±36.8	-7.4±18.1
	Quzhou	68.0±19.7	5.8±4.5	-56.3±47.7	-12.6±17.1	-39.7±24.3	-7.0±63.5	-12.5±24.2
	Shaoxing	104.9±57.7	15.5±10.5	3.4±22.6	-3.2±5.9	-17.7±10.3	33.5±36.6	3.7±4.7
	Taizhou	131.9±47.5	6.9±6.1	2.2±18.7	-15.6±9.3	-17.1±6.9	-0.5±10.6	-39.4±59.5
	Wenzhou	97.6±69.4	11.0±14.3	-30.7±47.1	-7.4±6.8	-29.8±24.7	-4.5±27.0	7.9±8.2
Zhoushan	130.1±47.4	13.0±10.1	-3.5±14.5	-7.2±4.7	-18.3±6.9	12.8±15.3	-16.2±19.0	

Table S10. Predicted decrease values of MDA8 O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in July, 2025.

Province	City	Base	S1 – Base	S1_E – Base	S2_E – Base	S3_E – Base	S2_E_NT – Base	S3_E_NT – Base
		Concentrations (µg/m ³)		Reduction amounts – mean ± std (µg/m ³)				
municipal	Shanghai	113.3±62.9	29.5±15.0	3.8±24.1	-4.2±6.0	-19.6±10.8	-18.6±15.1	4.9±9.1
	Anqing	114.9±47.8	3.9±6.6	-3.8±10.0	-7.4±9.2	-18.3±6.1	6.1±19.5	-17.7±20.5
	BengBu	96.8±36.5	-2.0±14.0	-46.7±42.2	-6.5±3.4	-5.7±18.3	14.6±10.8	6.7±10.2
	Bozhou	117.0±65.2	18.0±14.1	-5.5±9.3	-13.2±15.6	-25.3±10.4	0.7±34.1	4.1±6.8
	Chizhou	83.9±50.0	29.6±17.6	2.6±9.7	-8.0±5.1	-15.6±5.7	-14.7±30.5	8.3±9.3
	Chuzhou	123.4±58.3	11.8±13.4	5.1±42.7	-11.5±7.0	-32.8±26.4	18.1±17.1	-35.2±31.2
	Fuyang	96.2±51.9	11.5±9.1	-27.1±20.4	-9.0±8.6	-11.7±7.7	-28.8±28.9	-1.3±10.4
	Hefei	103.1±53.4	24.0±12.8	-5.2±16.1	-7.3±9.4	-32.0±18.3	13.8±20.0	9±27.2
	Huaibei	91.9±54.1	6.5±8.4	-57.2±49.5	-7.4±6.1	-39.4±22.6	-34.5±44.1	-8.5±12.7
Huainan	70.7±32.3	20.6±13.1	1.0±15.4	-4.2±2.9	-22.2±8.8	28.8±26.3	7.8±27.3	

	Huangshan	122.5±58.8	15.1±11.9	1.2±23.9	-10.6±4.6	-23.6±12.9	-3.6±6.7	-16.0±25.3
	Luan	135.4±68.6	15.1±9.5	13.0±16.4	-15.6±6.6	-22.1±7.4	-2.3±10.7	4.0±4.9
	Maanshan	114.0±70.6	17.6±12.5	-4.1±10.8	-12.1±4.7	-18.6±9.5	-22.3±23.1	2.0±2.9
	Suzhou	117.8±52.6	3.0±9.0	-61.8±45.6	-24.5±19.9	-43.7±19.7	-0.7±18.4	10.3±12.7
	Tongling	94.0±56.6	5.0±8.3	-7.7±34.4	-5.6±9.3	-23.8±19.3	27.1±38.2	2.9±6.8
	Wuhu	84.1±41.5	29.2±12.4	-6.9±6.2	-11.8±15.2	-20.3±6.0	7.2±22.1	1.5±13.0
	Xuancheng	94.2±69.5	32.8±16.2	1.3±21.1	-14.6±6.3	-21.2±9.0	16.9±20.1	5.8±24.4
	Changzhou	86.4±51.3	9.8±6.8	2.2±11.3	-10.9±11.5	-14.7±4.5	9.4±21.6	-17.9±26.1
	Huaian	115.2±56.8	17.8±13.6	-6.7±14.7	-2.8±4.9	-18.9±6.9	21.3±29.2	4.8±5.4
	Lianyungang	113.2±65.5	-1.2±14.2	-12±19.7	-6.8±5.4	-25.4±9.9	2.3±22.9	-3.6±22.7
	Nanjing	92.3±33.6	8.1±9.4	-23.8±41.6	-9.4±8.2	-18.6±12.3	-37±30.4	1.1±9.4
	Nantong	101.5±68.3	8.9±14.1	-4.5±5.4	-16.1±6.9	-12.3±3.5	-4.8±14.1	2.9±6.1
	Suqian	108.4±56.1	13.1±12.9	-28.4±28.8	-9.3±10.9	-36.7±17.7	6.5±23	10.1±10.1
Jiangsu	Suzhou	95.9±38.5	-1.2±16.8	10.9±38.7	-15.6±7.4	-29.6±21.3	-5.2±11.7	5.5±6.4
	Taizhou	107.7±63.7	6.9±8.0	-0.7±16.3	-12.8±11.7	-16±10.2	-27.9±35.7	13.7±9.4
	Wuxi	107.0±55.4	27.7±14.5	5.9±39.5	-7.1±8.5	-25.2±25.1	23.3±36.1	-12.8±15.2
	Xuzhou	96.9±76.9	5.5±7.8	-1.9±17.4	-13.7±7.2	-25.2±10.0	-2.9±13.2	2.7±6.9
	Yangzhou	93.3±38.9	3.2±3.7	7.6±22	-10.3±10.5	-28.1±12.2	1.3±30.0	-7.0±20.7
	Yancheng	133.2±65.3	7.8±6.4	-12.2±37.5	-4.9±9.6	-27.4±18.4	6.6±17.7	-0.1±9.6
	Zhenjiang	75.0±30.7	4.2±9.3	-13.2±38.5	-2.9±7.4	-22.4±19.3	5.6±17.2	14.6±10.8
	Hangzhou	75.4±27.1	15.2±10.9	18.9±31.9	-7.9±13.8	-23.0±9.8	11.5±25.0	2.2±4.5
	Huzhou	95.7±38.5	19.1±10.1	-52.7±41.3	-8.7±4.1	-29.6±13.7	5.8±10.2	-1.9±16.7
	Jiaxing	92.5±52.4	9.1±7.9	-5.1±13.8	-10.8±9.4	-17.0±7.3	-40±24.2	-4.0±21.7
	Jinhua	102.9±64.4	14.1±13.7	-45.4±55.7	-18.2±7.1	-12.1±10.3	-5.6±8.3	-23.5±20.8
	Lishui	118.7±63.8	7.3±8.2	-61.6±42.6	-5.6±9.0	-51.2±21.9	-1.6±18.3	3.0±8.4
Zhejiang	Ningbo	76.5±28.8	14.2±10.9	-13.9±32.3	-9.8±5.7	-23.1±16.9	3.9±12.3	0.8±14.7
	Quzhou	65.2±17.0	20.7±14.7	-7.8±16.1	-6.2±8.9	-14.6±6.5	-11.6±32.7	4.2±19.4
	Shaoxing	95.6±63.9	5.2±7.0	-5.7±10.6	-7.2±10.3	-17.4±7.8	-36.4±39.3	4.9±13.9
	Taizhou	147.4±81.8	23.6±13.8	-73.9±48.9	-6.6±11.3	-35.3±17.9	-1.7±20.9	0.4±7.4
	Wenzhou	114.3±68.9	10.1±8.6	-2.9±24.1	-4.6±5.5	-21.0±8.6	14.6±20.2	9.2±10.5
	Zhoushan	135.5±68.1	24.4±16.8	7.6±22.0	-10.3±10.5	-28.1±12.2	1.3±30.0	6.0±7.5

Table S11. Predicted decrease values of MDA8 O₃ concentrations under the six control scenarios relative to the baseline case in 41 main cities of YRD in August, 2025.

Province	City	Base	S1 –	S1_E –	S2_E –	S3_E –	S2_E_NT –	S3_E_NT –
		Concentrations (µg/m ³)	Base	Base	Base	Base	Base	Base
municipal	Shanghai	68.9±56.8	24.2±9.5	0.7±22.5	-3.1±4.9	-18.6±9.0	0.2±29.3	-4.3±4.6
	Anqing	67.7±42.3	33.7±24.0	3.5±18.4	-3.9±6.9	-13.0±10.5	11.0±30.2	1.3±11.9
	BengBu	92.2±45.7	9.3±5.3	-46.2±46.8	-5.1±3.2	-25.6±19.5	5.7±5.2	-46.5±28.5
	Bozhou	75.5±60.3	23.3±12.3	1.3±21.9	-7.1±6.7	-23.7±11.0	-12.5±30.2	5.7±10.5
	Chizhou	60.5±34.5	24.8±22.4	2.2±29.1	-2.3±3.0	-19.7±11.2	8.2±7.5	13.6±8.4
Anhui	Chuzhou	86.2±48.8	16.2±10.4	4.0±21.3	-5.4±6.6	-22.2±9.4	-8.5±31.6	-14.9±21.2
	Fuyang	81.9±56.6	39.7±17.5	-2.3±10.6	-4.9±4.1	-10.2±9.5	-3.7±17.9	5.8±4.7
	Hefei	77.2±56.7	37.5±20.3	-46.9±54.6	-7.2±5.0	-39.3±29.2	-24.8±29.5	-18.8±15.7
	Huaibei	49.0±13.9	22.3±15.8	-1.5±62.7	-3.8±6.9	-3.05±12.3	-36.7±23.9	-8.9±20.7
	Huainan	53.8±18.3	16.7±15.1	-104±96.5	-8.7±12.3	-69.7±58.7	11.7±26.1	-10.7±34.6
	Huangshan	116.7±51.0	20.8±14.1	-37.6±55.7	-5.9±9.9	-28.7±26.2	1.6±32.4	6.2±5.6

	Luan	114.3±53.8	0.2±3.7	-44.0±55.7	-5.9±6.2	-31.2±26.0	-17.4±27.3	8.3±15.7
	Maanshan	70.2±63.2	8.6±9.6	7.5±10.4	-12.5±12.3	-12.8±9.3	10.6±22.5	6.1±27.0
	Suzhou	72.6±44.5	14.7±11.3	-11.5±33.1	-3.3±9.5	-21.2±14.6	12.5±18.4	7.1±13.2
	Tongling	69.7±49.3	34.2±12.8	2.2±5.9	-9.9±8.2	-11.6±7.7	-6.1±6.0	-21.2±18.1
	Wuhu	82.0±90.8	33.1±25.0	-15.3±26.4	-5.2±2.6	-14.4±6.9	9.0±5.8	5.6±10.2
	Xuancheng	83.8±69.6	21.1±11.3	-55.3±30.8	-11.0±11.1	-23±12.2	14.2±22.0	5.7±5.3
	Changzhou	87.5±71.6	17.5±8.6	4.6±5.7	-26.3±15.4	-13.4±4.2	-56.6±30.7	-14.7±15.9
	Huaiian	86.8±61.2	18.4±8.6	10.6±17.0	-5.8±6.9	-21.5±8.8	14.6±20.9	-25.3±27.8
	Lianyungang	99.6±53.9	14.3±14.2	-43.7±37.1	-7.7±5.0	-23.5±12.0	-24.9±24.7	-14.1±23.0
	Nanjing	74.9±21.7	11.5±7.3	-14.8±23.6	-4.7±3.6	-15.7±7.1	11.2±8.2	-33.8±42.7
	Nantong	93.7±48.4	17.1±14.9	-11.2±34.2	-6.4±4.3	-12.8±7.9	-20.4±26.5	14.9±10.8
	Suqian	52.9±36.1	28.0±15.9	-2.7±27.0	-2.5±5.7	-25.5±14.7	4.2±14.7	4.9±7.1
Jiangsu	Suzhou	82.2±39.5	18.2±17.4	14.2±13.0	-14.2±11.1	-12.6±4.4	-39.8±57.5	-15.6±16.4
	Taizhou	66.6±54.7	11.6±12.1	-8.7±9.4	-3.4±4.7	-11.6±9.8	-2.1±28.2	13.0±11.4
	Wuxi	73.7±50.4	15.3±17.7	-69.9±55.0	-3.0±5.9	-43.5±26.1	21.3±20.8	2.4±3.4
	Xuzhou	75.0±58.0	22.0±12.9	5.4±19.5	-9.7±9.0	-13.7±11.9	16.3±19.0	-0.6±21.1
	Yangzhou	77.6±38.4	15.2±20.2	4.7±34.9	-4.0±11.1	-12.5±9.4	26.7±46.3	-7.4±25.9
	Yancheng	112.5±56.7	16.6±6.9	8.3±23.9	-15.4±15.7	-17.8±8.1	5.8±28.4	1.6±6.2
	Zhenjiang	65.9±38.7	12.7±7.7	1.5±23.1	-7.4±13.8	-25.9±10.8	8.2±21.1	10.8±7.6
	Hangzhou	61.4±23.0	12.5±6.2	-16.4±25.5	-8.4±9.0	-14.2±13.1	3.6±24.4	-17.1±23.9
	Huzhou	78.8±38.8	5.7±10.0	4.9±9.5	-7.8±5.2	-7.6±6.2	-33.5±25.3	4.6±13.1
	Jiaxing	64.9±53.9	27.5±25.0	-36.2±51.5	-17.7±15.5	-30.3±17.8	6.9±25.3	-67.3±76.9
	Jinhua	45.2±38.1	17.0±19.0	-55.1±28.6	-11.4±12.8	-15.9±11.8	-55.2±58.6	10.6±13.1
	Lishui	77.6±69.5	17.5±18.6	-40.9±52.7	-5.4±6.2	-23.4±22.7	-7.7±34.7	3.0±17.4
Zhejiang	Ningbo	80.5±43.8	18.3±16.4	-28.4±40.1	-4.7±3.7	-32.5±16.8	-5.1±20.0	9.3±10.3
	Quzhou	67.2±30.8	19.8±15.6	-39.8±58.6	-10.8±8.9	-25.1±27.5	-33.8±41.5	4.8±14.1
	Shaoxing	76.9±50.7	28.7±20.9	-74±73.8	-5.5±5.9	-50.8±38.4	-0.6±29.5	-12.3±20.3
	Taizhou	128.1±54.8	9.0±10.2	-54±47.3	-6.8±9.5	-28.8±19.2	-15.1±28.4	2.3±10.5
	Wenzhou	59.2±52.0	21.9±15.5	14.0±13.8	-3.7±3.6	-19.8±8.3	25.6±12.6	12.9±16.1
	Zhoushan	117.8±55.5	20.1±14.9	-71.0±32.9	-3.4±3.2	-48.3±28.4	18.3±14.1	11.3±11.1