Supplement of Atmos. Chem. Phys., 25, 4571–4585, 2025
https://doi.org/10.5194/acp-25-4571-2025-supplement

Atmospheric Chemistry and Physics
Open Access
EGU

Supplement of

Locating and quantifying CH_4 sources within a wastewater treatment plant based on mobile measurements

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Figures

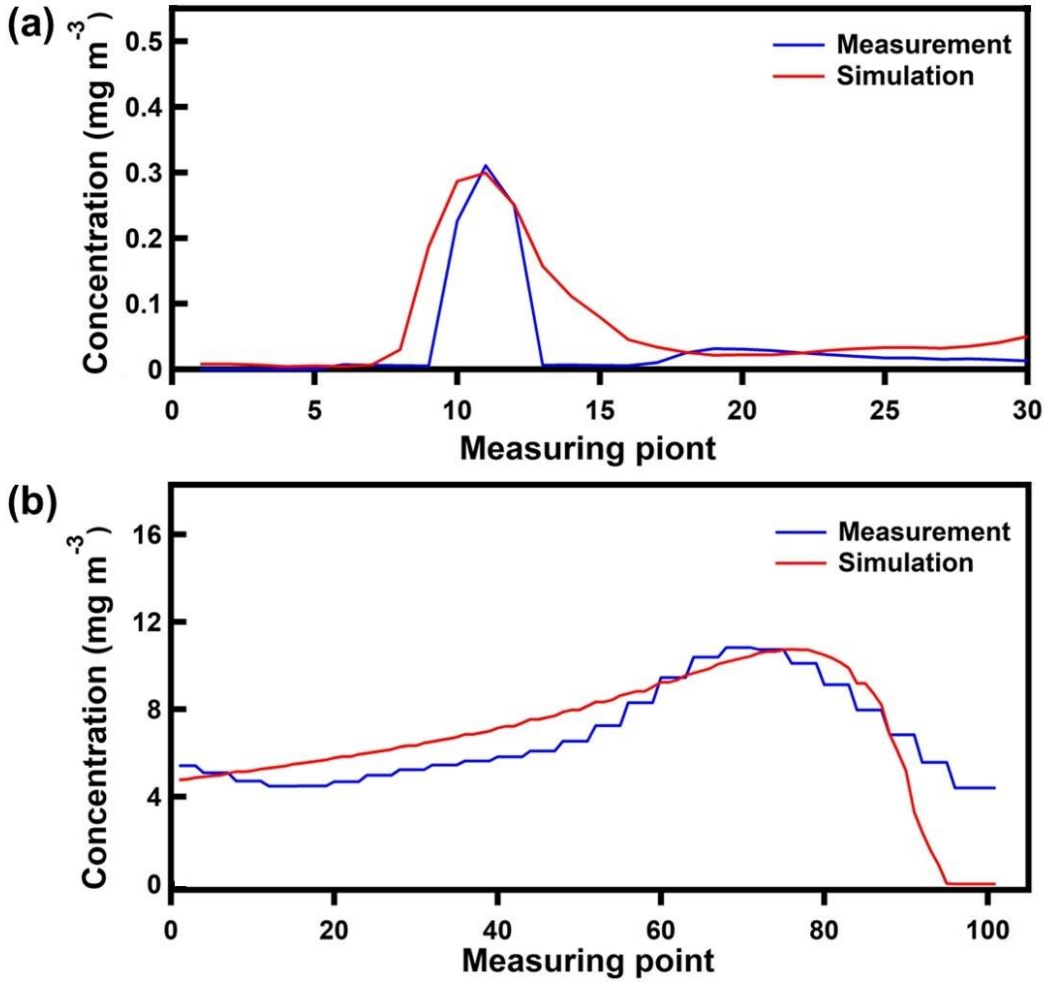

Figure S1. Comparison of CH_4 measurement and model simulation. (a) CH_4 concentration measurements for Aeration Tank ① and point source model simulation on 29 June (b) CH_4 concentration measurements and the line source model simulation on a road between the Screen ① and the Primary Clarifier ①.

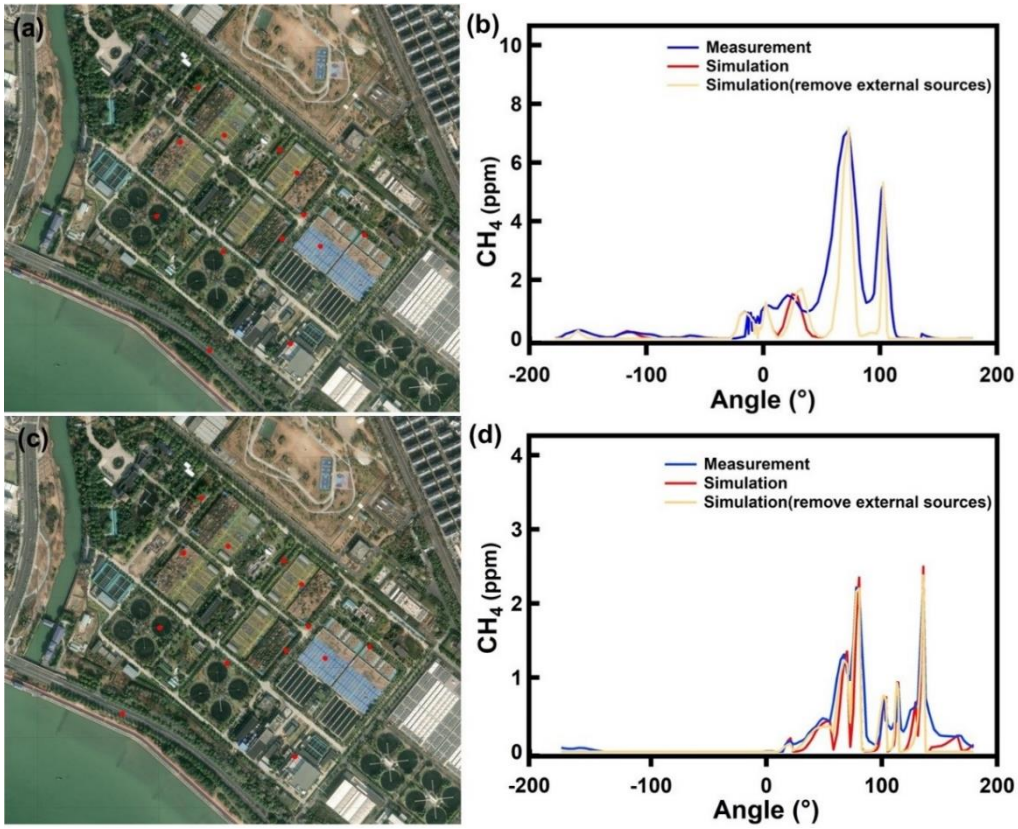

Figure S2. The emission sources localization on 29 June (a) and 13 December (c). And the comparison of CH_4 measurement and model simulation (considering external sources) on 29 June (b) and 13 December (d). Map data are from Esri.

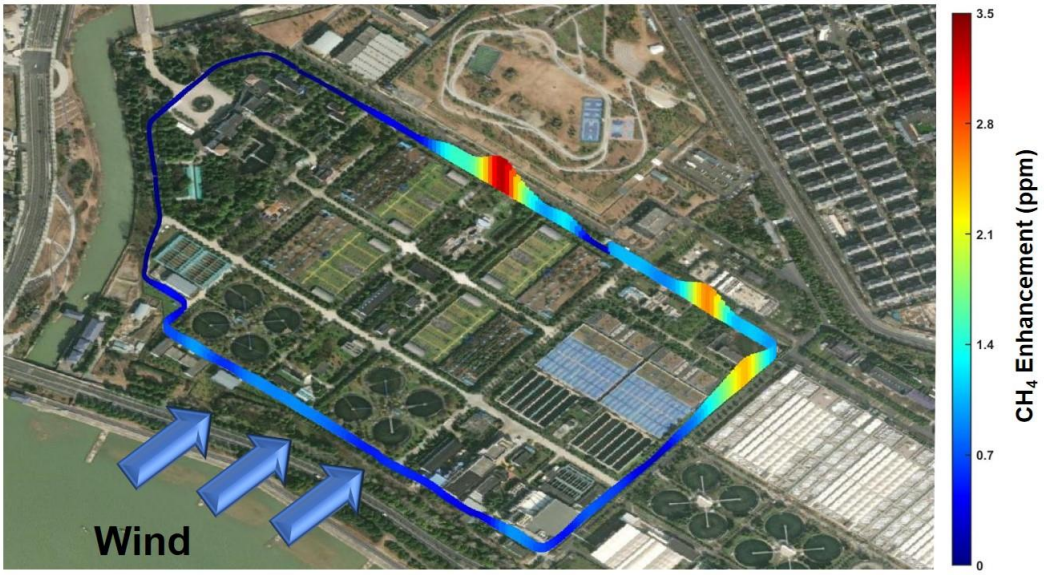

Figure S3. The CH_4 concentration map for the external roads of the WWTP on 1 June. Map data are from Esri.

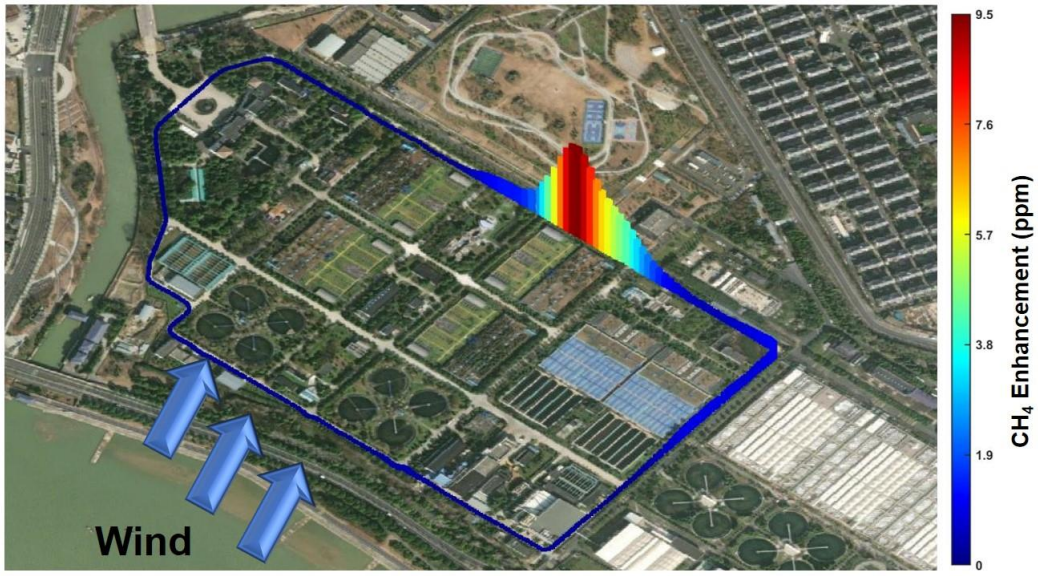

Figure S4. The CH_4 concentration map for the external roads of the WWTP on 11 July. Map data are from Esri.

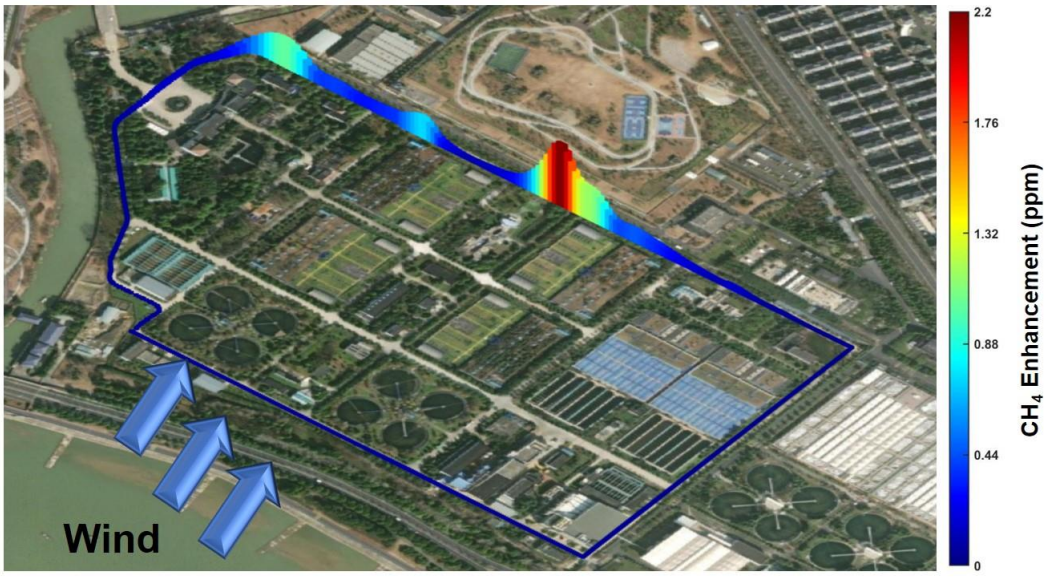

Figure S5. The CH_4 concentration map for the external roads of the WWTP on 14 December. Map data are from Esri.

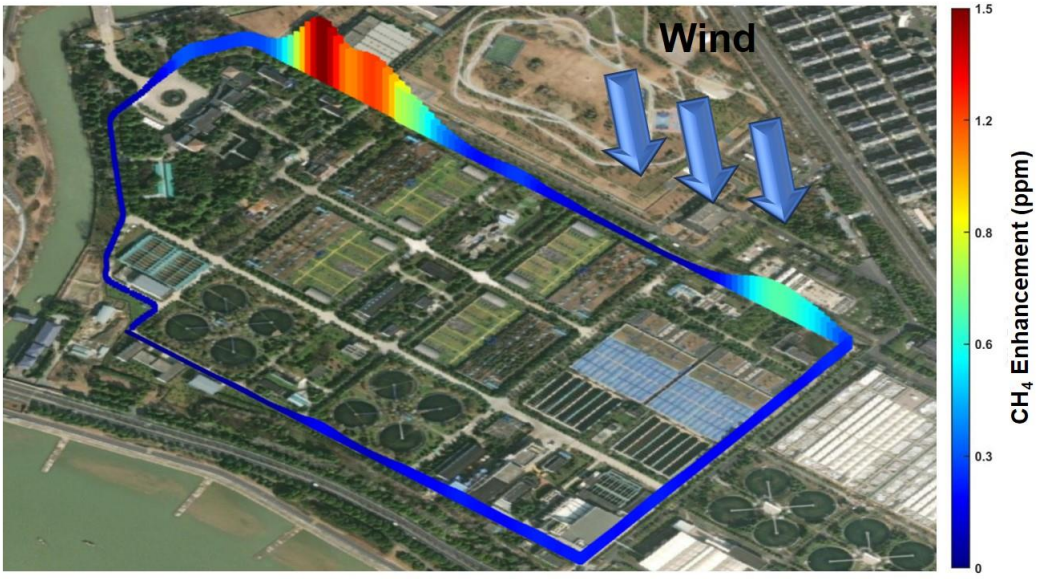

Figure S6. The CH_4 concentration map for the external roads of the WWTP on 20 December. Map data are from Esri.

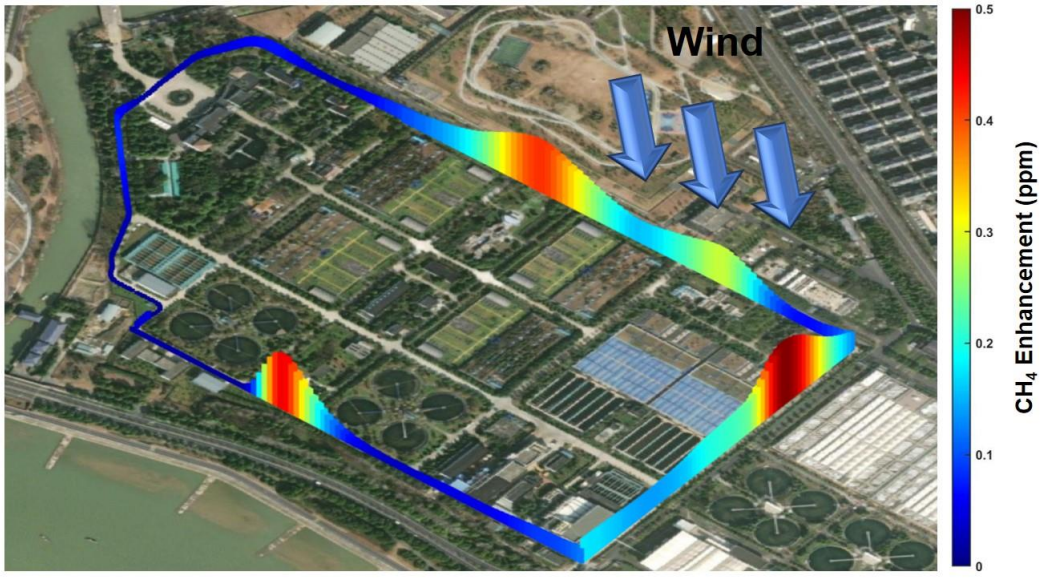

Figure S7. The CH_4 concentration map for the external roads of the WWTP on 21 December. Map data are from Esri.

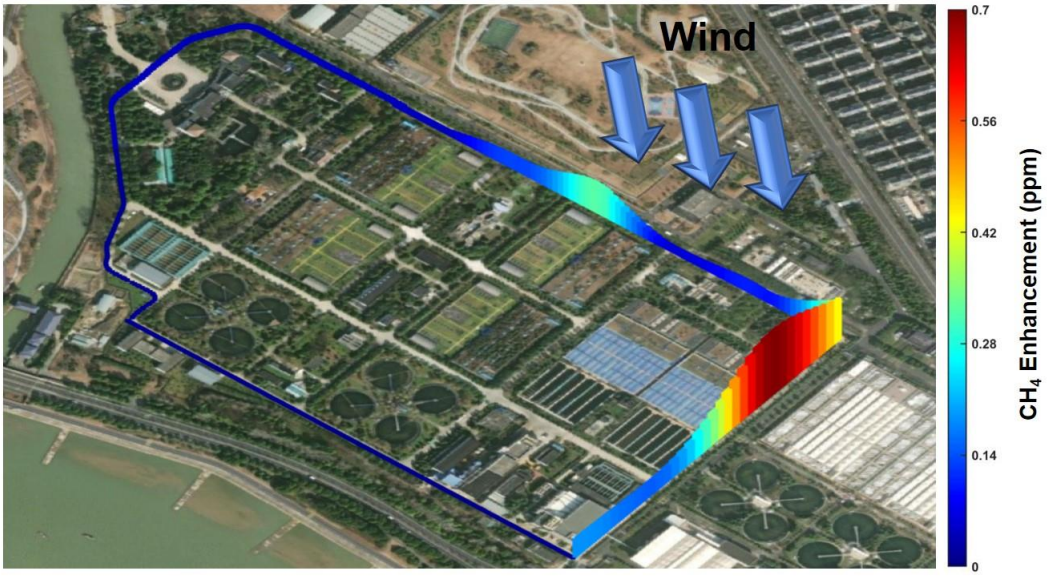

Figure S8. The CH_4 concentration map for the external roads of the WWTP on 22 December. Map data are from Esri.

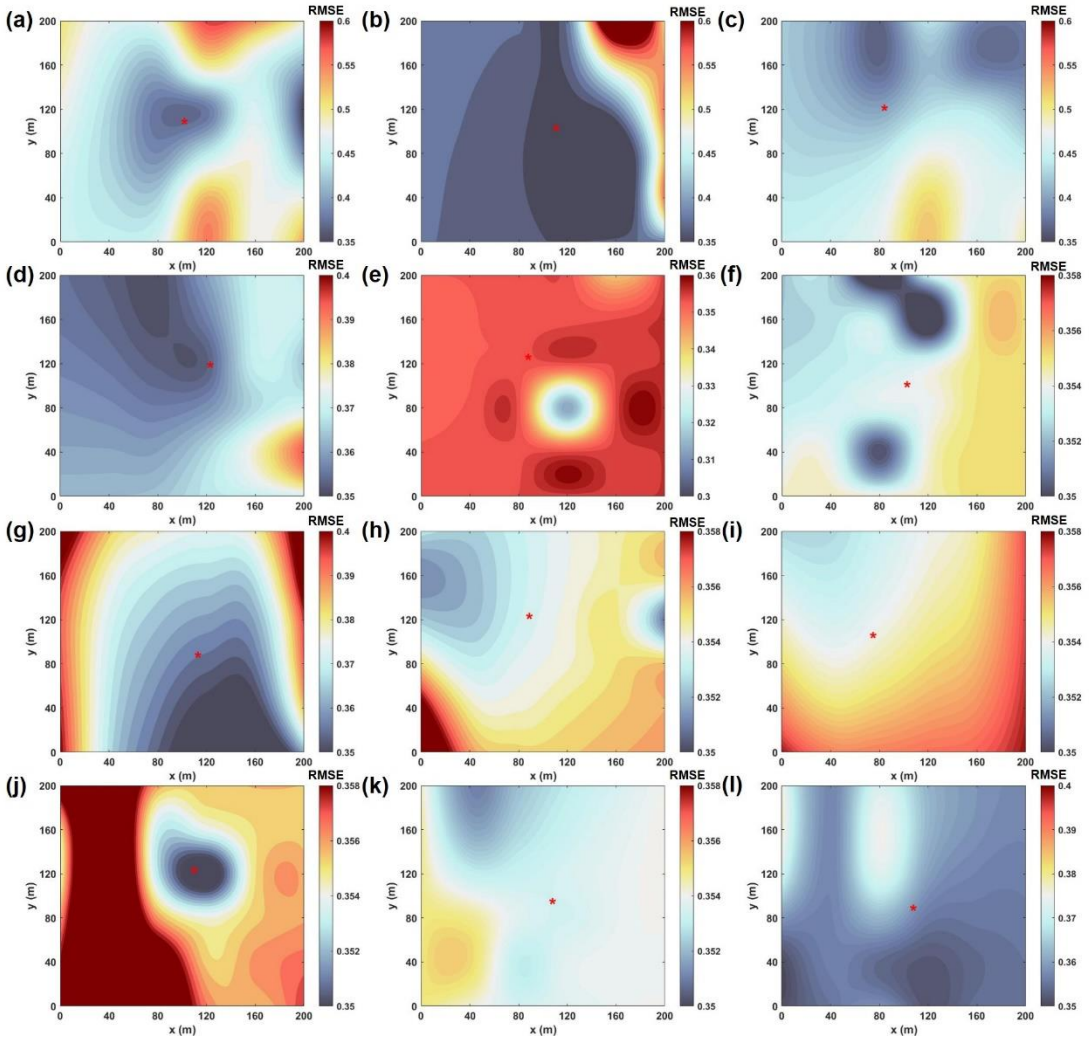

Figure S9. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 1 June.

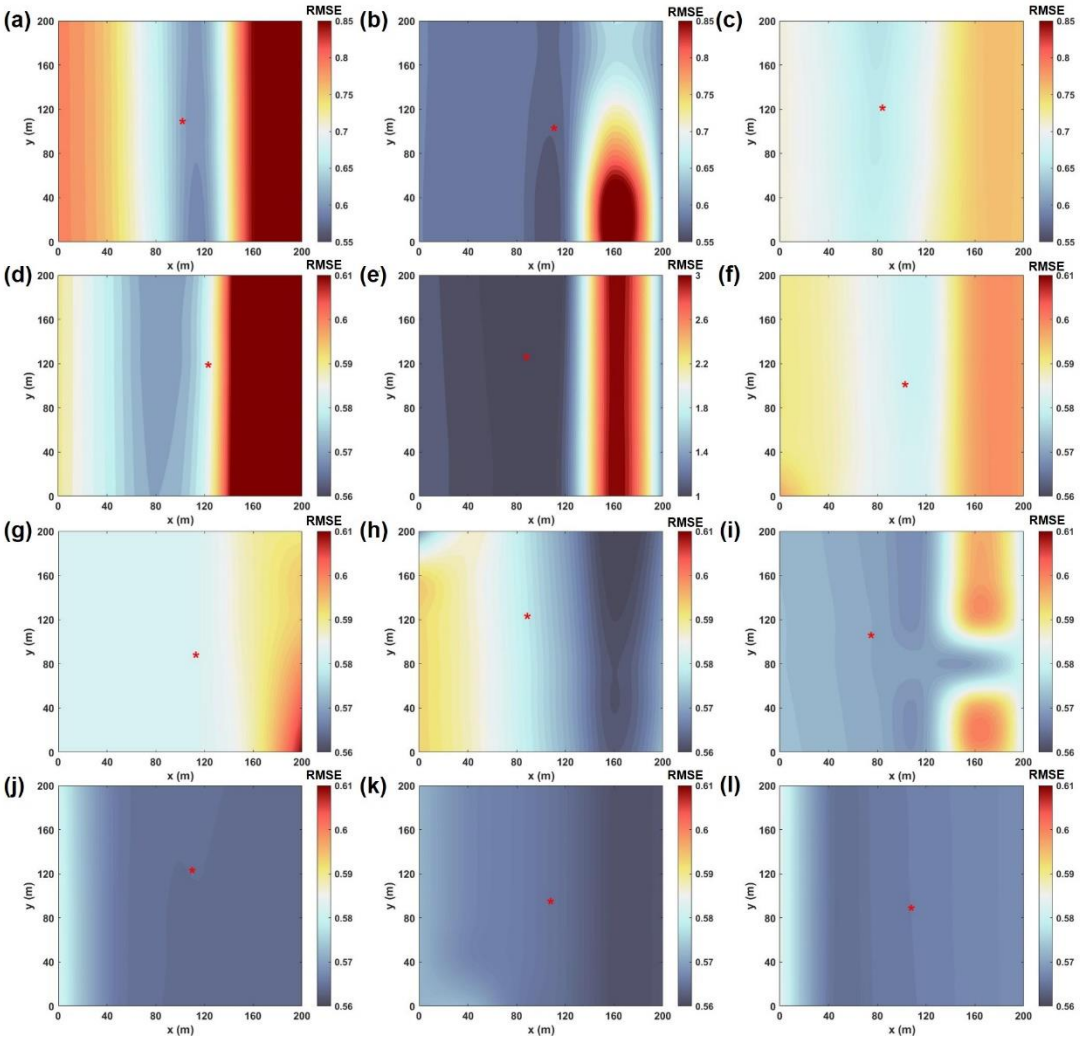

Figure S10. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 11 July.

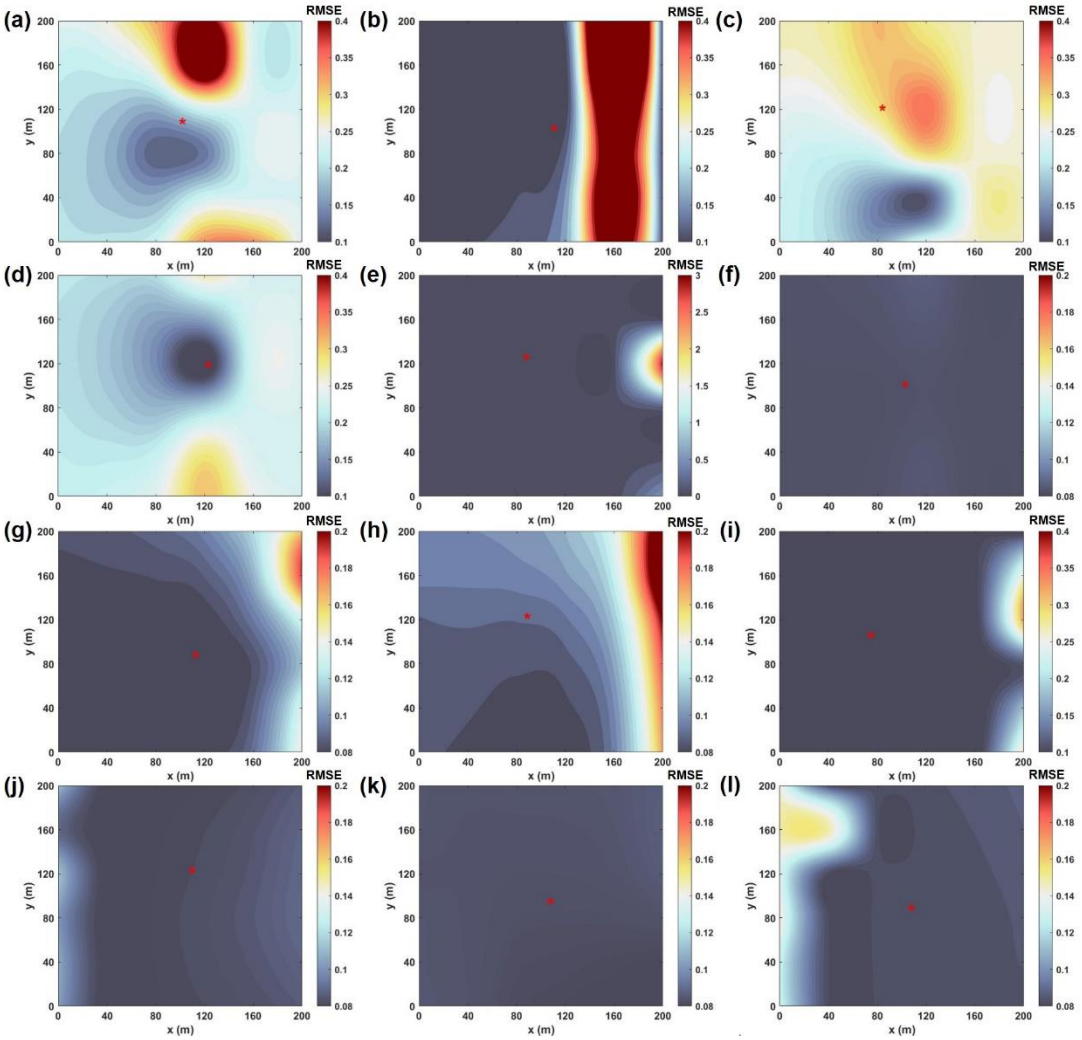

Figure S11. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 14 December.

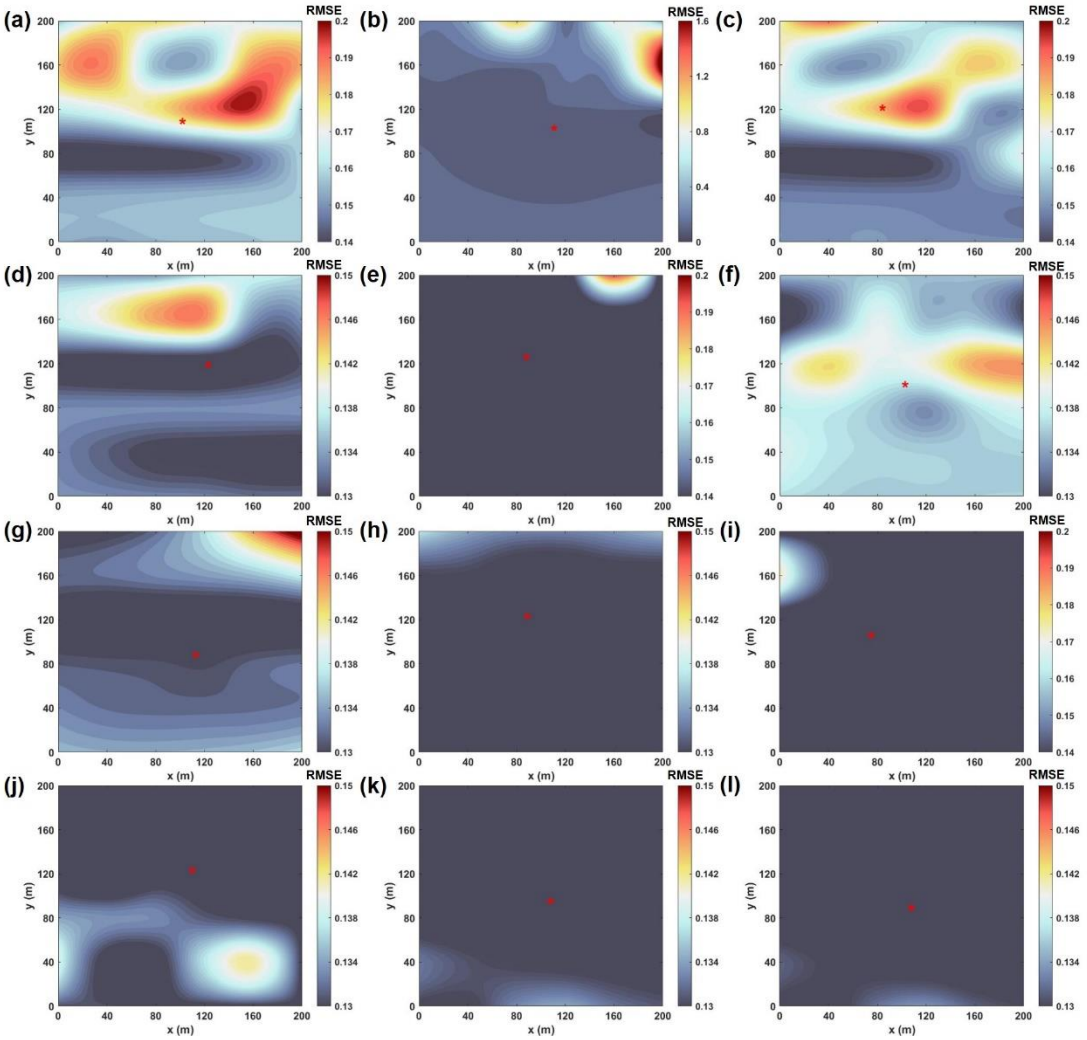

Figure S12. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 20 December.

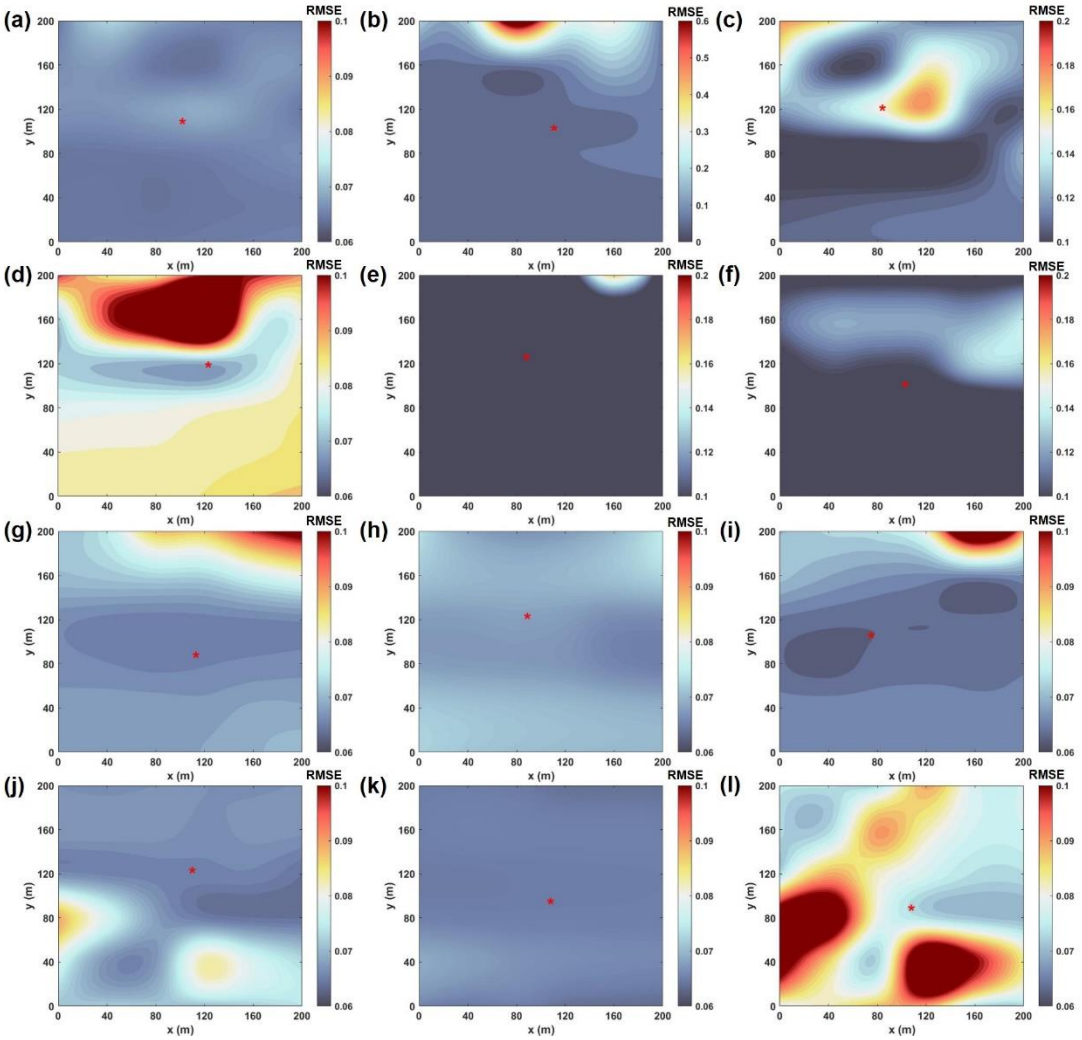

Figure S13. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 21 December.

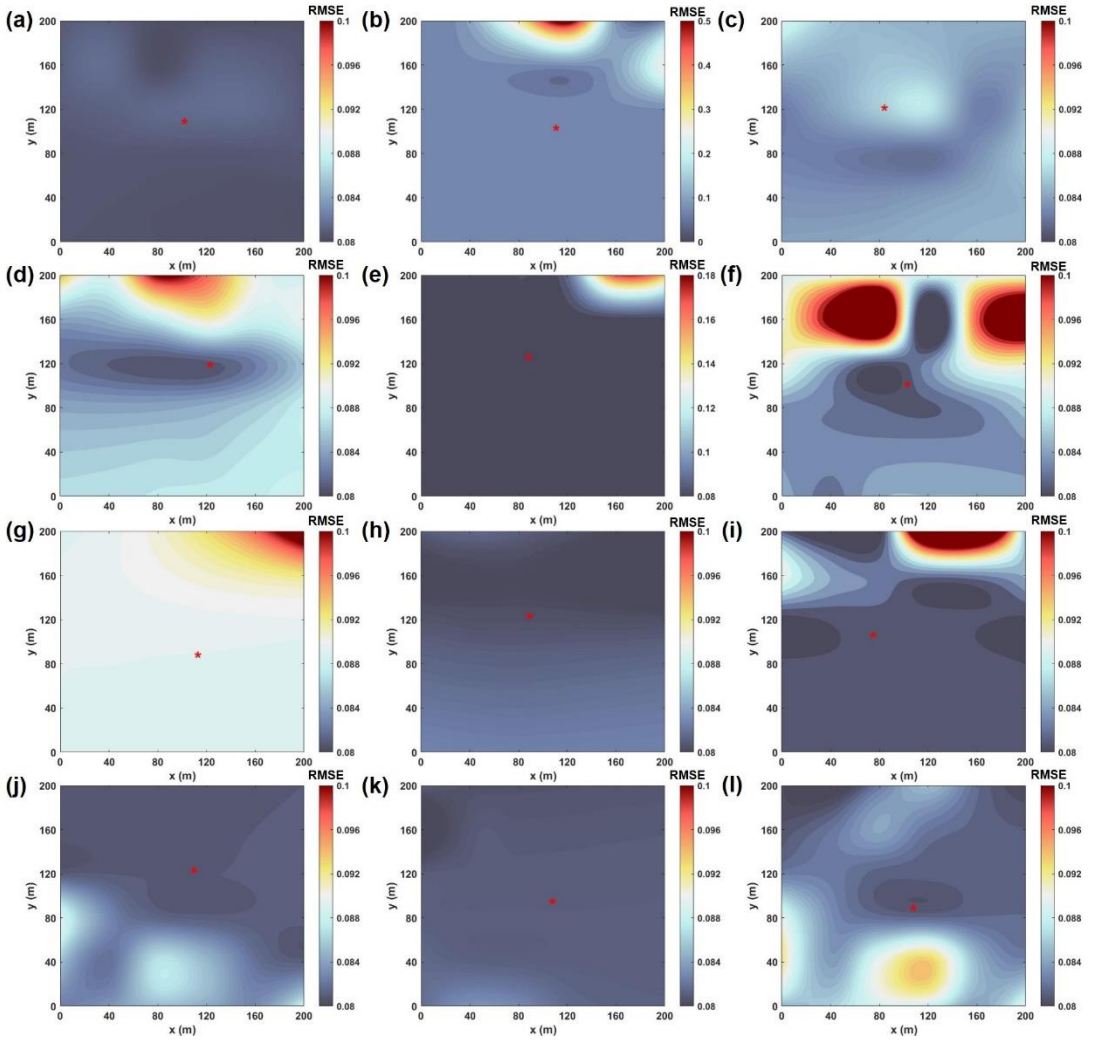

Figure S14. The root-mean-square error (RMSE) of monitoring simulated concentration changes with the location of the WWTP source on 22 December.

Tables

Table S1. CH_4 emission fluxes of experimental emission sources in summer measurements. Serial number 1-12 corresponds to the types of point sources in Figure 3 (a) and 4 (a) in the text, and serial number 13 is the line source.

Emission Sources	Emission Fluxes (kg h^{-1})		
	0601	**0629**	**0711**
1-Aeration Tank ③	7.55	7.07	5.75
2-Primary Clarifier ③	2.04	1.90	1.95
3-Screen ①	4.45	18.26	3.05
4-Primary Clarifier ④	2.97	2.88	2.86
5-Aeration Tank ④	3.58	7.94	20.99
6- Primary Clarifier ⑤	3.21	1.40	1.44
7-Aeration Tank ②	4.29	1.90	1.96
8-Aeration Tank ①	3.05	2.90	3.06
9-Aeration Tank ⑤	4.53	3.68	2.07
10-Secondary Clarifier ①	1.55	1.31	1.60
11-Secondary Clarifier ②	0.73	1.23	1.14
12-Sludge Treatment	1.96	1.82	1.98
13-Screen①-Primary Clarifier①	21.94	22.61	21.74
Total	61.85	74.90	69.59

86 **Table S2.** CH_4 emission fluxes of experimental emission sources in winter measurements.

Emission Sources	Emission Fluxes (kg h^{-1})				
	1213	**1214**	**1220**	**1221**	**1222**
1-Aeration Tank ③	3.78	3.53	4.33	1.79	0.86
2-Primary Clarifier ③	3.25	1.86	4.03	2.69	2.06
3-Screen ①	3.57	2.81	3.93	3.90	3.62
4-Primary Clarifier ④	3.03	2.80	2.11	3.12	3.08
5-Aeration Tank ④	0.61	0.65	0.53	0.80	0.90
6- Primary Clarifier ⑤	2.43	0.18	2.34	3.00	4.50
7-Aeration Tank ②	1.30	1.59	3.14	3.10	3.02
8-Aeration Tank ①	2.77	3.16	2.86	3.28	3.05
9-Aeration Tank ⑤	3.93	1.70	1.49	0.96	1.59
10-Secondary Clarifier ①	1.57	1.31	1.48	1.64	1.99
11-Secondary Clarifier ②	0.83	0.97	1.12	0.92	1.05
12-Sludge Treatment	2.12	2.05	3.15	2.03	2.32
13-Screen①-Primary Clarifier①	20.01	20.66	19.48	20.94	20.12
Total	49.20	43.27	49.99	48.17	48.16

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