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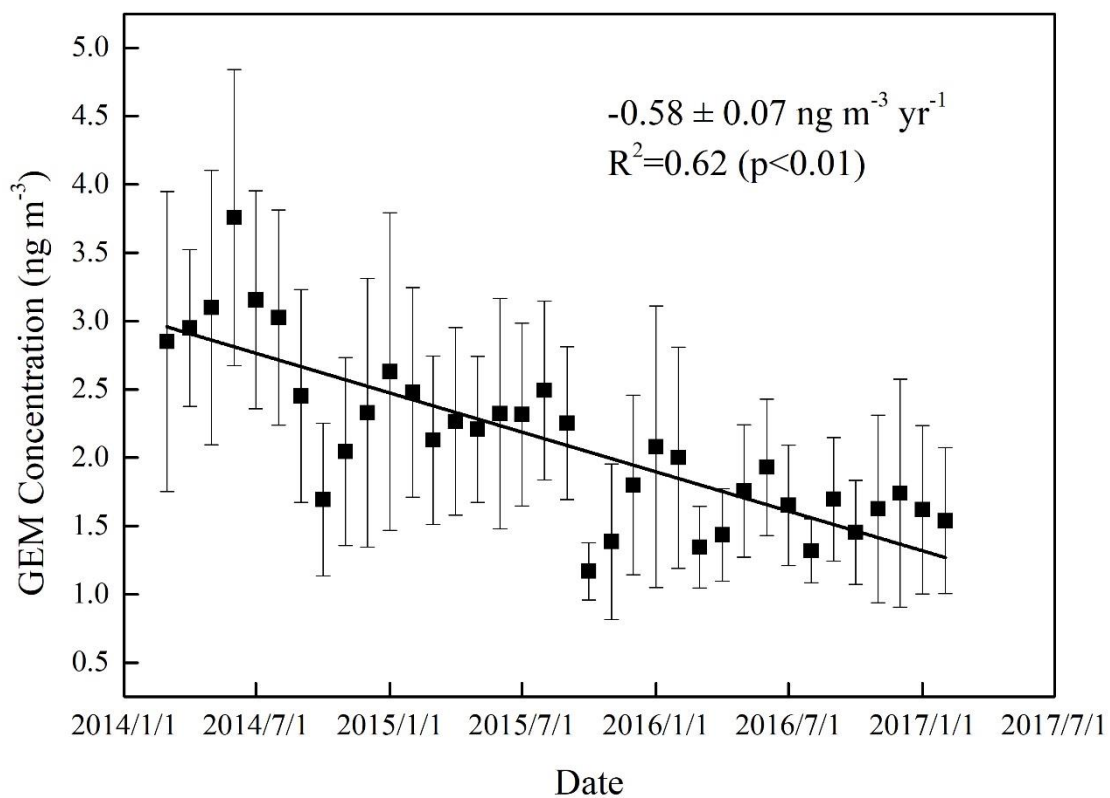
*Supplement of*

## **Recent decrease trend of atmospheric mercury concentrations in East China: the influence of anthropogenic emissions**

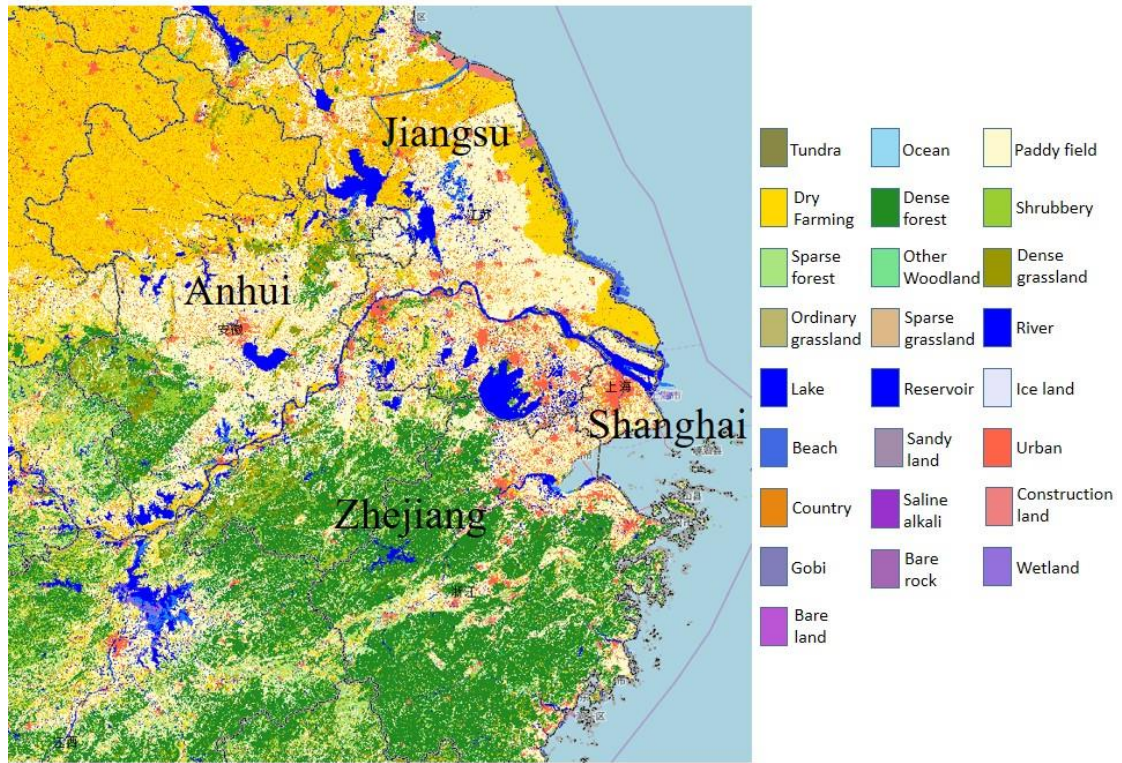
**Yi Tang et al.**

*Correspondence to:* Shuxiao Wang (shxwang@tsinghua.edu.cn) and Qingru Wu (qrwu@tsinghua.edu.cn)

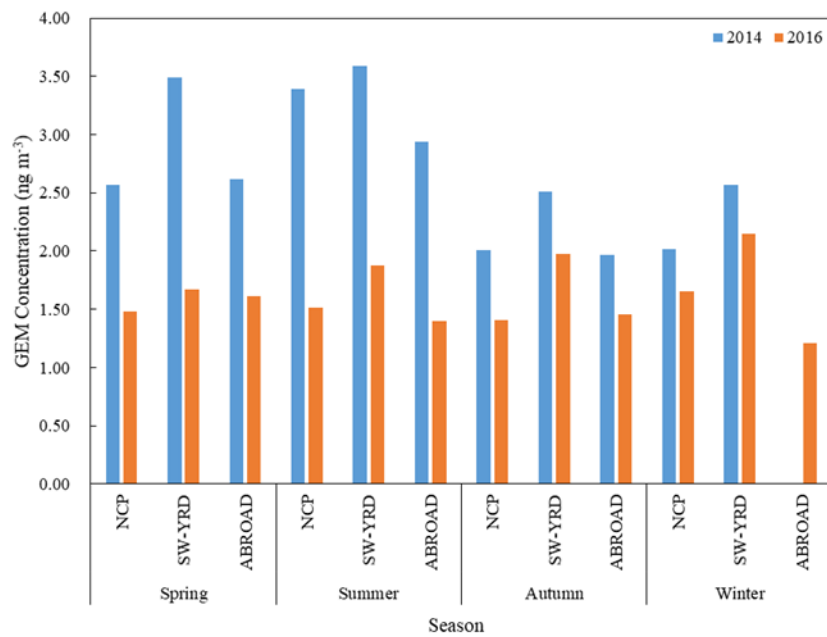
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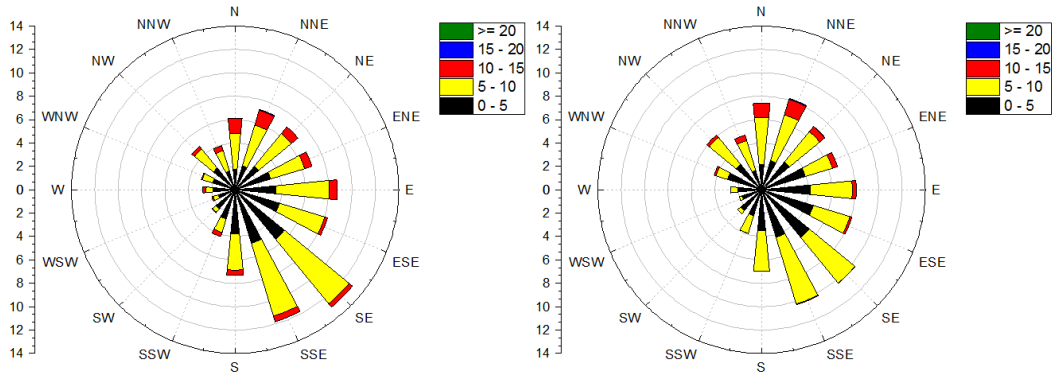
**Figure S1.** The trend of monthly average GEM concentration from March 2014 to February 2017. The monthly average of GEM in January of 2016 is simulated as the average value that in the January of 2015 and 2017. The same method is used for the data in February of 2016.



**Figure S2.** Land use type of YRD region in 2015



**Figure S3.** The seasonality of GEM concentration in the NCP, SW-YRD and ABROAD region (No trajectory transport though ABROAD in winter of 2014)



**Figure S4.** Wind rose at Chongming island in 2014 and 2016

**Table S1.** Monthly distribution factor for cement clinker production, coal-fired power plants, coal-fired industrial boilers, resident coal combustion, cement clinker production, iron and steel production in potential sources region in 2014 and 2016

Cement clinker production									
2014	Shanghai	Jiangsu	Zhejiang	Anhui	2016	Shanghai	Jiangsu	Zhejiang	Anhui
Jan	0.10	0.06	0.10	0.10	Jan	0.00	0.00	0.00	0.00
Feb	0.00	0.00	0.00	0.00	Feb	0.00	0.00	0.00	0.00
Mar	0.08	0.09	0.08	0.09	Mar	0.04	0.13	0.11	0.11
Apr	0.09	0.09	0.10	0.09	Apr	0.22	0.14	0.10	0.05
May	0.09	0.10	0.09	0.10	May	0.08	0.11	0.10	0.07
Jun	0.09	0.09	0.08	0.09	Jun	0.08	0.13	0.09	0.07
Jul	0.09	0.09	0.08	0.09	Jul	0.09	0.11	0.10	0.07
Aug	0.09	0.09	0.08	0.09	Aug	0.06	0.10	0.08	0.07
Sep	0.08	0.10	0.09	0.08	Sep	0.11	0.09	0.08	0.10
Oct	0.10	0.10	0.10	0.09	Oct	0.08	0.08	0.10	0.09
Nov	0.10	0.10	0.10	0.10	Nov	0.13	0.05	0.11	0.17
Dec	0.10	0.10	0.10	0.10	Dec	0.12	0.06	0.12	0.20

Coal-fired power plants									
2014	Shanghai	Jiangsu	Zhejiang	Anhui	2016	Shanghai	Jiangsu	Zhejiang	Anhui
Jan	0.10	0.08	0.07	0.09	Jan	0.10	0.08	0.07	0.09
Feb	0.10	0.07	0.07	0.08	Feb	0.09	0.07	0.07	0.08
Mar	0.11	0.09	0.09	0.09	Mar	0.09	0.09	0.10	0.08
Apr	0.09	0.10	0.09	0.08	Apr	0.07	0.08	0.08	0.08
May	0.09	0.09	0.09	0.08	May	0.07	0.08	0.08	0.07
Jun	0.07	0.08	0.08	0.08	Jun	0.06	0.08	0.08	0.07
Jul	0.08	0.09	0.09	0.10	Jul	0.10	0.09	0.10	0.09
Aug	0.07	0.08	0.08	0.09	Aug	0.11	0.10	0.10	0.10
Sep	0.05	0.07	0.07	0.07	Sep	0.07	0.08	0.08	0.08
Oct	0.05	0.08	0.08	0.07	Oct	0.07	0.08	0.08	0.07
Nov	0.07	0.08	0.09	0.08	Nov	0.07	0.08	0.08	0.08
Dec	0.11	0.10	0.10	0.09	Dec	0.10	0.09	0.10	0.10

Iron and steel production									
2014	Shanghai	Jiangsu	Zhejiang	Anhui	2016	Shanghai	Jiangsu	Zhejiang	Anhui
Jan	0.09	0.08	0.07	0.07	Jan	0.09	0.08	0.07	0.07
Feb	0.08	0.07	0.07	0.07	Feb	0.09	0.08	0.07	0.07
Mar	0.09	0.08	0.09	0.08	Mar	0.09	0.09	0.09	0.08
Apr	0.09	0.08	0.09	0.08	Apr	0.09	0.09	0.10	0.08
May	0.09	0.08	0.08	0.09	May	0.09	0.08	0.09	0.08
Jun	0.09	0.08	0.09	0.09	Jun	0.08	0.09	0.09	0.08
Jul	0.09	0.08	0.08	0.09	Jul	0.08	0.08	0.09	0.08
Aug	0.09	0.07	0.08	0.09	Aug	0.08	0.08	0.08	0.13
Sep	0.07	0.08	0.08	0.09	Sep	0.08	0.08	0.08	0.08
Oct	0.07	0.08	0.08	0.09	Oct	0.08	0.08	0.08	0.09
Nov	0.07	0.08	0.09	0.08	Nov	0.08	0.08	0.08	0.09
Dec	0.09	0.13	0.10	0.08	Dec	0.08	0.08	0.09	0.09

Coal-fired industrial boilers									
2014	Shanghai	Jiangsu	Zhejiang	Anhui	2016	Shanghai	Jiangsu	Zhejiang	Anhui
Jan	0.09	0.08	0.08	0.09	Jan	0.08	0.07	0.08	0.08
Feb	0.08	0.08	0.07	0.09	Feb	0.08	0.07	0.08	0.07
Mar	0.07	0.09	0.09	0.10	Mar	0.09	0.08	0.09	0.09
Apr	0.06	0.08	0.09	0.09	Apr	0.08	0.08	0.09	0.09
May	0.09	0.09	0.08	0.08	May	0.09	0.09	0.08	0.08
Jun	0.09	0.09	0.07	0.08	Jun	0.08	0.08	0.08	0.08
Jul	0.09	0.08	0.08	0.07	Jul	0.08	0.08	0.09	0.09
Aug	0.09	0.07	0.08	0.08	Aug	0.08	0.08	0.08	0.08
Sep	0.08	0.09	0.08	0.09	Sep	0.08	0.08	0.08	0.08
Oct	0.08	0.08	0.09	0.08	Oct	0.09	0.09	0.09	0.09
Nov	0.08	0.08	0.09	0.07	Nov	0.08	0.09	0.09	0.08
Dec	0.09	0.08	0.09	0.08	Dec	0.09	0.09	0.09	0.08

Residential coal combustion									
2014	Shanghai	Jiangsu	Zhejiang	Anhui	2016	Shanghai	Jiangsu	Zhejiang	Anhui
Jan	0.33	0.33	0.33	0.33	Jan	0.33	0.33	0.33	0.33
Feb	0.33	0.33	0.33	0.33	Feb	0.33	0.33	0.33	0.33
Mar	0.05	0.05	0.05	0.05	Mar	0.05	0.05	0.05	0.05
Apr	0.00	0.00	0.00	0.00	Apr	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	May	0.00	0.00	0.00	0.00
Jun	0.00	0.00	0.00	0.00	Jun	0.00	0.00	0.00	0.00
Jul	0.00	0.00	0.00	0.00	Jul	0.00	0.00	0.00	0.00
Aug	0.00	0.00	0.00	0.00	Aug	0.00	0.00	0.00	0.00
Sep	0.00	0.00	0.00	0.00	Sep	0.00	0.00	0.00	0.00
Oct	0.00	0.00	0.00	0.00	Oct	0.00	0.00	0.00	0.00
Nov	0.05	0.05	0.05	0.05	Nov	0.05	0.05	0.05	0.05
Dec	0.23	0.23	0.23	0.23	Dec	0.23	0.23	0.23	0.23

**Table S2.** The meteorological condition between 2014 and 2016 in Chongming

Month	Temperature		Solar Radiation		Releative Humidity	
	2014(°C)	2016(°C)	2014(W m <sup>-2</sup> )	2016(W m <sup>-2</sup> )	2014 (%)	2016 (%)
1		4.39		104.47		71.28
2		5.73		143.68		67.69
3	10.14	9.55	156.61	150.31	79.66	71.43
4	14.85	14.77	163.29	161.88	75.11	80.35
5	20.59	19.24	181.49	176.04	78.15	78.50
6	22.87	22.98	171.20	156.63	82.98	83.00
7	26.86	27.82	244.30	224.52	84.62	82.24
8	24.64	28.31	262.20	253.61	78.38	74.03
9	22.08	24.49	197.20	153.34	74.36	75.27
10	17.76	20.82	168.21	122.81	70.47	75.67
11	10.94	13.64	117.01	113.00	68.96	75.25
12	5.34	8.99	114.60	103.87	59.47	71.62
Average	17.61	16.73	177.61	155.35	75.22	75.53



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**Table S3.** The amount of valid data during sampling period

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014			5914	6125	6493	5568	4634	6255	6491	7106	7578	5564
2015	5227	4532	5216	3392	4072	4797	7591	6538	3434	2223	4363	8833
2016			1370	8293	7476	5884	5424	5641	3561	4544	6292	4589

**Table S4.** Historical variation trends of atmospheric Hg in previous studies

Monitoring site	Duration	TGM trend (pg m <sup>-3</sup> yr <sup>-1</sup> )	Variation trend	Site description	Monitoring instrument	References
Alert, Canada	2000-2009	-13(-21,0)	-0.9% y <sup>-1</sup>	Remote	2537A	Cole et al. 2013
Kuujuarapik, Canada	2000-2009	-33(-50,-18)	-2.1% y <sup>-1</sup>	Remote	2537A	Cole et al. 2013
Egbert, Canada	2000-2009	-35(-44,-27)	-2.2% y <sup>-1</sup>	Remote	2537A	Cole et al. 2013
Zeppelin Stn, Norway	2000-2009	+2(-7,+12)	no trend	Remote	2537A	Cole et al. 2013
St.Anicet, Canada	2000-2009	-29(-31,-27)	-1.9% y <sup>-1</sup>	Remote	2537A	Cole et al. 2013
Kejimkujik, Canada	2000-2009	-23(-33,-13)	-1.6% y <sup>-1</sup>	Remote	2537A	Cole et al. 2013
Head, Ireland	1996-2009		-1.3±0.2% y <sup>-1</sup>	Rural	2537A	Weigelt et al. 2015
Yong San, South Korea	2004-2011	No trend (3.54±1.46 ng m <sup>3</sup> )		Urban	AM-3	Kim et al. 2016
Yong San, South Korea	2013-2014	Decrease to 2.34±0.73 ng m <sup>3</sup>			AM-3	Kim et al. 2016
Mt. Changbai	2013-2015	Decrease from 1.74 ng m <sup>-3</sup> to 1.58 ng m <sup>-3</sup>		Remote	2537B	Fu et al. 2015
Chongming Island, China	2014-2016	-600	-29.4%/y	Remote	2537X	This study

**Table S5.** The annual concentration of SO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub> and PM<sub>2.5</sub> at Chongming site, NCP, and SW-YRD regions

Year	2014			2016			Change			
Pollutants	Region	NCP	SW-YRD	Chongming	NCP	SW-YRD	Chongming	NCP	SW-YRD	Chongming
PM <sub>2.5</sub> (µg m <sup>-3</sup> )		71.93	53.05	25.09	60.75	44.75	23.89	-16%	-16%	-5%
SO <sub>2</sub> (µg m <sup>-3</sup> )		34.52	21.01	1.60	24.37	16.40	1.47	-29%	-22%	-8%
NO <sub>2</sub> (µg m <sup>-3</sup> )		45.07	34.34	12.62	41.55	34.40	10.84	-8%	0%	-14%
O <sub>3</sub> (µg m <sup>-3</sup> )		60.29	56.27	41.70	61.84	60.92	44.38	3%	8%	6%
GEM (ng m <sup>-3</sup> )		No data		2.68	No data		1.60	No data		-40%

Note: According to the contribution of trajectory, the dominant provinces in the NCP region included Beijing, Tianjin, Hebei, Shandong and Liaoning province. The SW-YRD mainly contained Shanghai, Zhejiang, Jiangsu, Jiangxi and Anhui province.

**Table S6.** Emission inventories of the main pollutants from the studied regions in 2014 and 2016

Air pollutants	2014		2016		Decline proportion	
	NCP	SW-YRD	NCP	SW-YRD	NCP	SW-YRD
PM <sub>2.5</sub> (kt)	2019	1209	1849	1109	-8%	-8%
NO <sub>x</sub> (kt)	5697	4022	5424	3855	-5%	-4%
SO <sub>2</sub> (kt)	3780	1993	3450	1780	-9%	-11%
GEM (t)	118	72	103	67	-13%	-7%

Note: According to the contribution of trajectory, the dominant provinces in the NCP region included Beijing, Tianjin, Hebei, Shandong and Liaoning province. The SW-YRD mainly contained Shanghai, Zhejiang, Jiangsu, Jiangxi and Anhui province.