# Supporting Material for

## Seasonal Changes in Gaseous Elemental Mercury in Relation to Monsoon Cycling over the Northern South China Sea

C.M. Tseng[1*], C.S. Liu[1], and C. Lamborg[2]

[1]Institute of Oceanography, National Taiwan University, P.O. Box 23-13, Taipei 106, Taiwan, Republic of China.

[2]Woods Hole Oceanographic Institute, MS 51, Woods Hole, MA 02543, USA

*To whom correspondence should be addressed. E-mail: cmtseng99@ntu.edu.tw

**This PDF file includes**

Figure S1-S5; Table S1

Figure Supplementary 1 (Fig. S1)

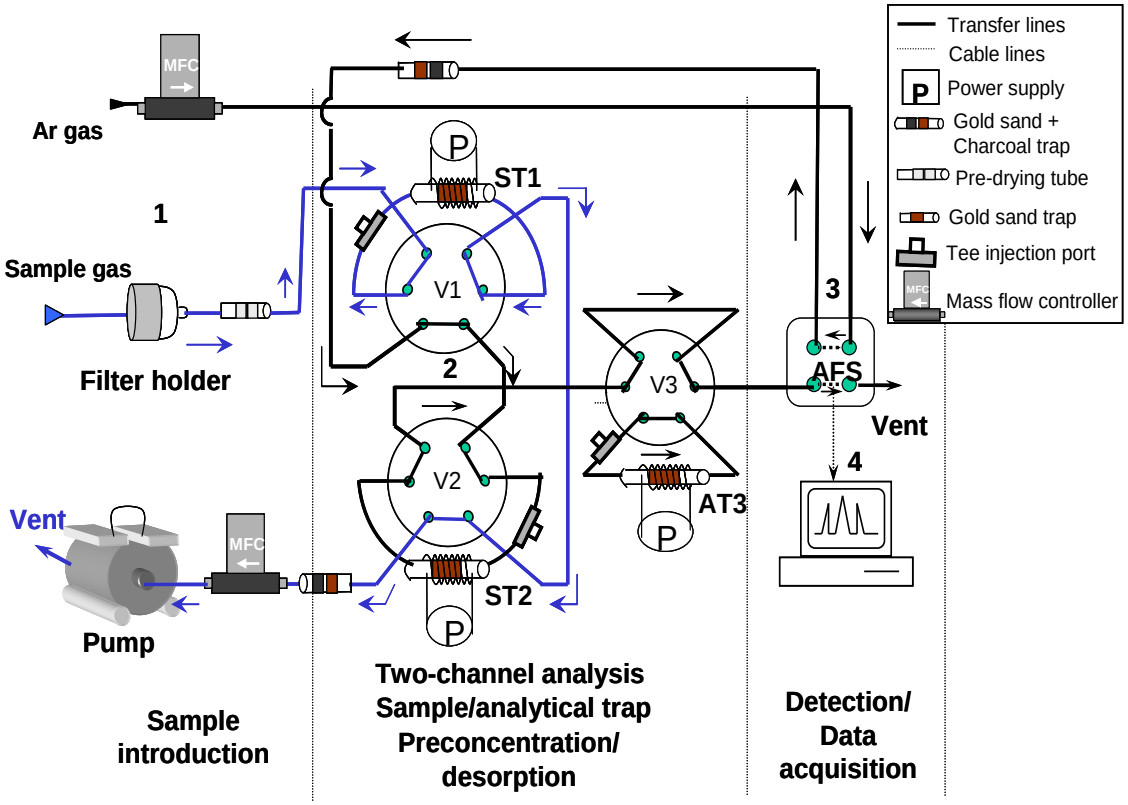


Fig S1 Schematic of GEMA with two-channel analysis for GEM determination in natural airs. 1. sampling introduction device; 2. six-way injection valves (injection-V1, -V2, -V3); 3. atomic fluorescence spectrometer (AFS, Tekran 2500); 4. personal computer for data acquisition (Adopted from Tseng et al. 2010, JAAS).

Table S1 Figures of merit of the GEMA

| Characteristic items | GEMA |
|---|---|
| Potential Hg speciation | Reactive gaseous, particulate and organo-Hg |
| Trap efficiency (%) | ~100 |
| Accuracy (%) | 110±10 |
| Absolute detection limit (pg) | 1 |
| Method detection limit (ng $m^{-3}$) | 0.1 (10 L of sample) |
| Calibration range | Wide dynamic (pg to ng) |
| R. square (n=5) | ≧0.995 |
| Reproducibility (%) | ≤ 5 |
| Flow rate (L $min^{-1}$) | 0.5~1 |
| Sample cycle time | 15 min ~ hours |
| Memory effect at 3 ng $Hg^0$ | No |
| Interference from water vapor | No |
| Versatile/Practical Feasibility | Multi-trap applications, multifunctional Hg speciation analysis |

Figure Supplementary 2 (Fig. S2)

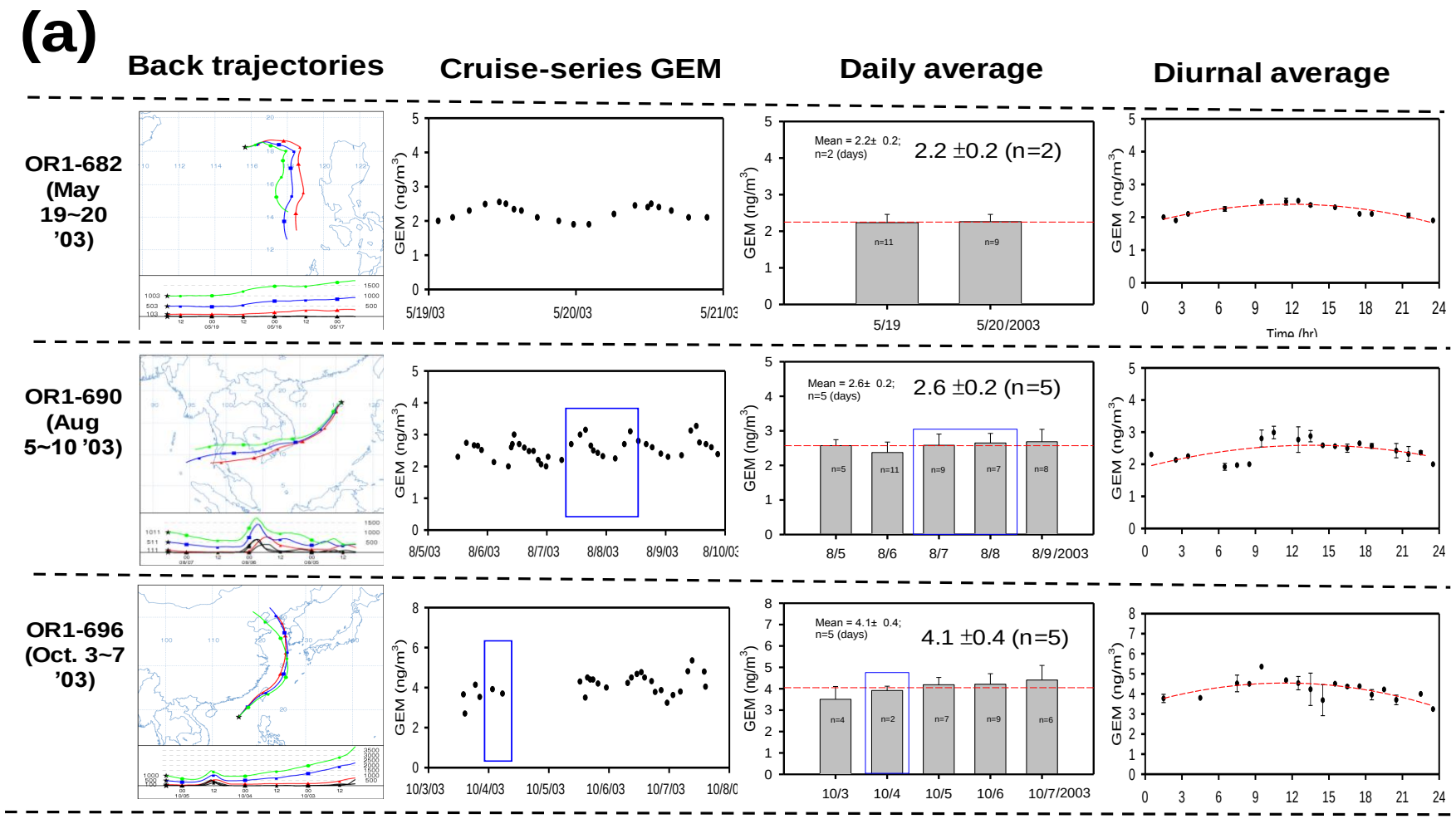

Fig. Supplementary 2 (to be continued)

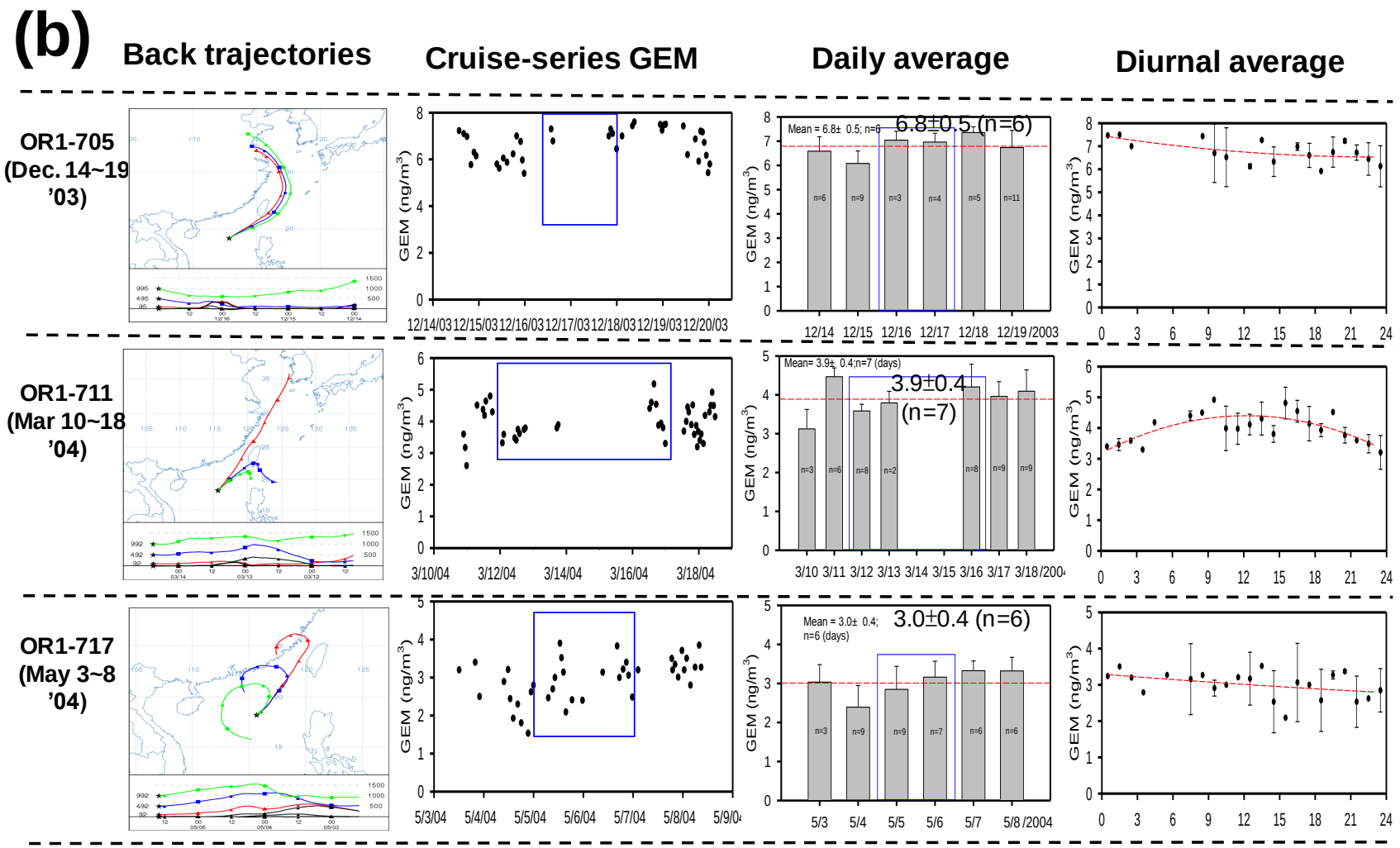

Fig. Supplementary 2 (to be continued)

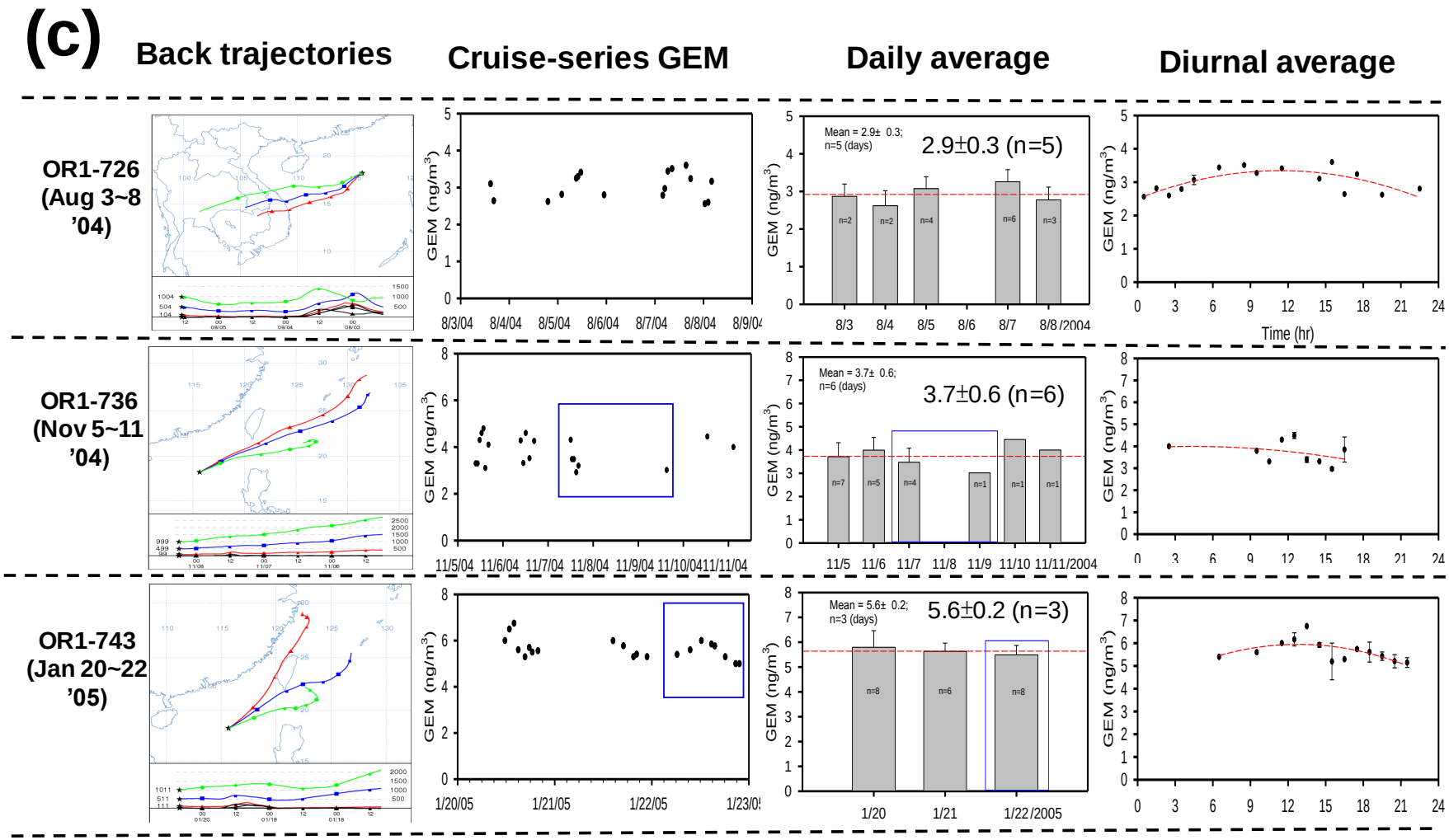

Fig. Supplementary 2 (to be continued)

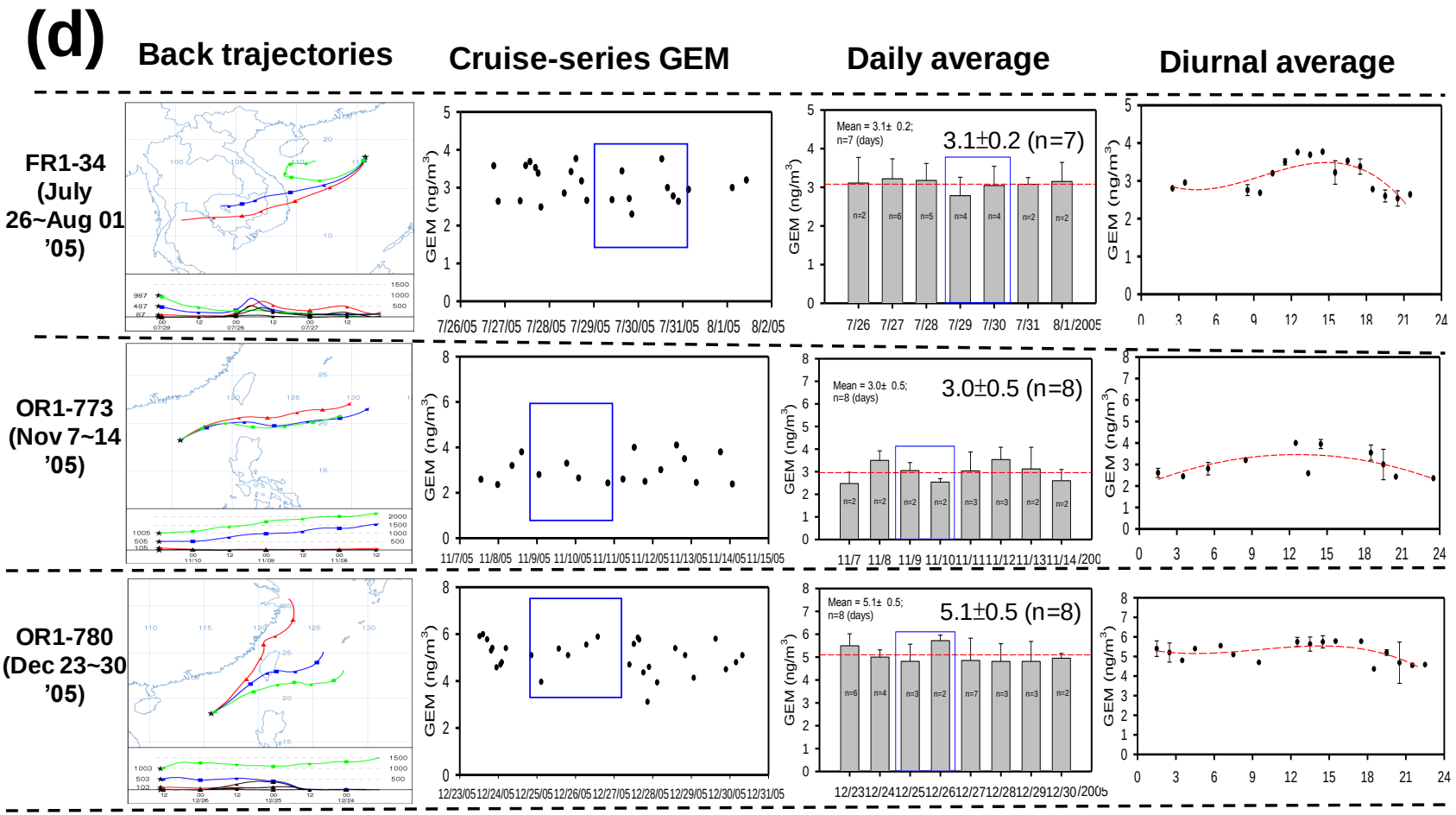


Fig S2 Summary of temporal GEM variations with related information over the northern SCS obtained during the study period from 2003 to 2005. *Blue frame denotes GEM measurements obtained at the SEATS station

Fig. Supplementary 3 (S3)

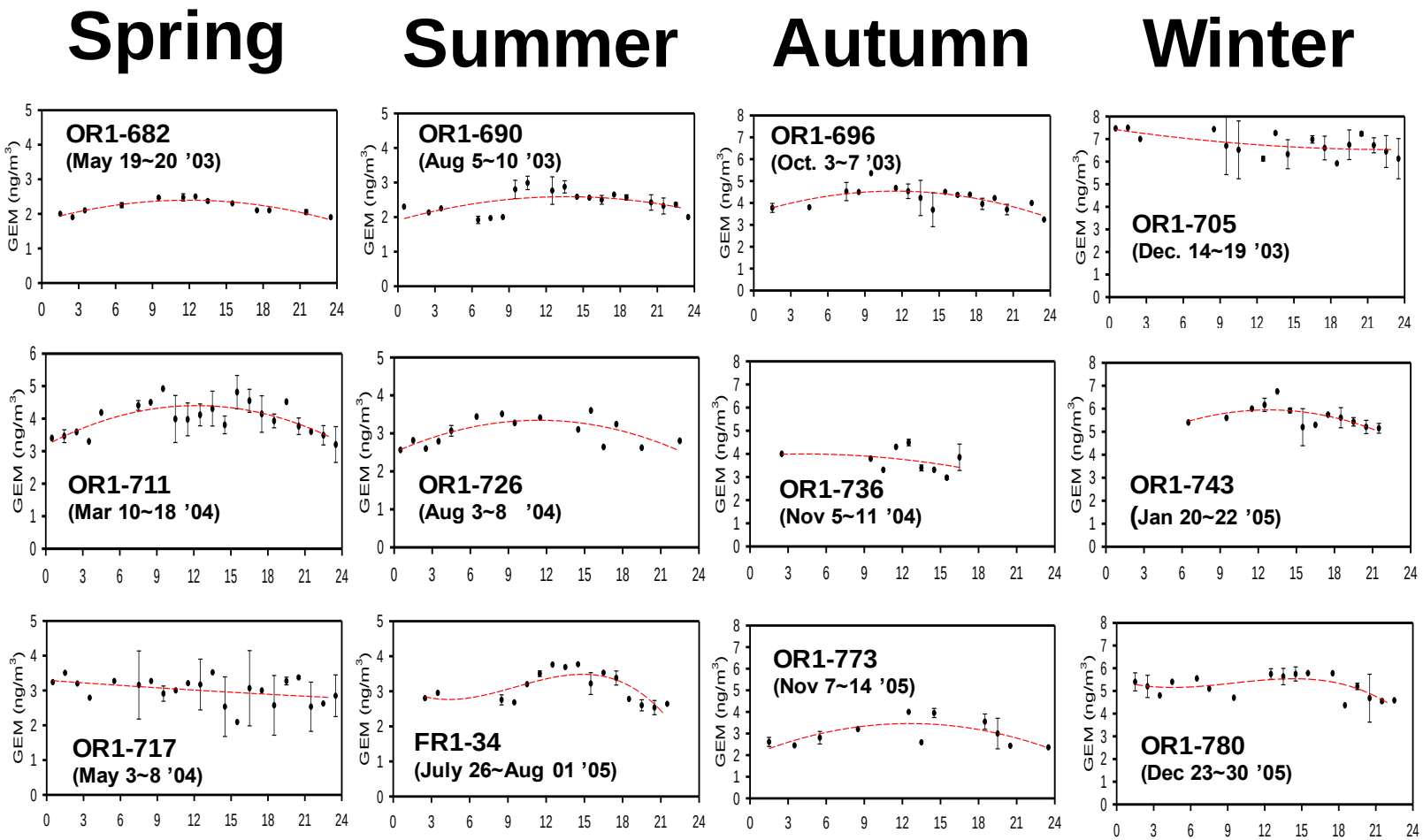


Fig S3 Summary of seasonally diurnal GEM variations over the northern SCS obtained during the study period from 2003 to 2005. Data points are indicated as averages ±1 standard deviations and red trend lines made by non-linear regression analyses.

Fig Supplementary 4 (S4)

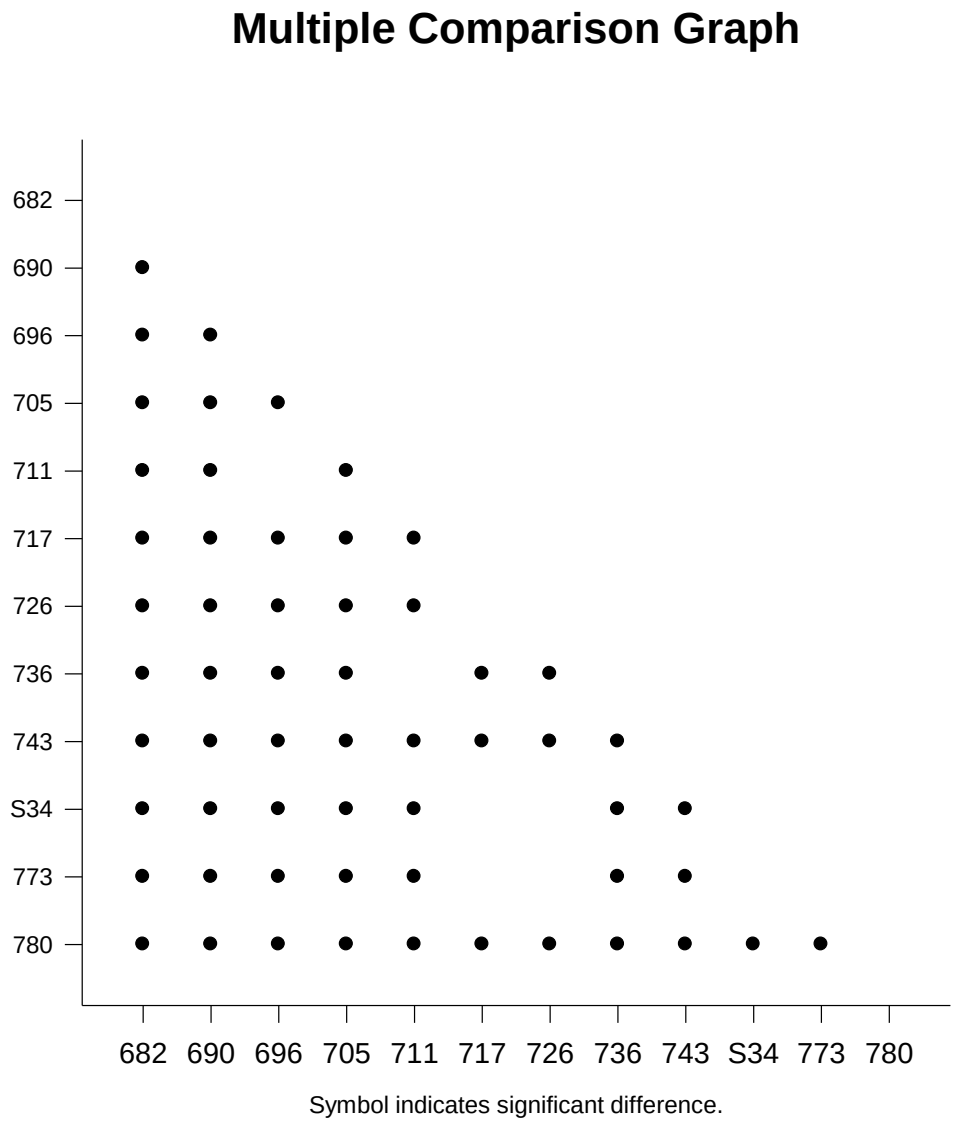


Fig S4 Seasonal differences in the mean values were statistically significant ($p<0.001$) estimated by One Way ANOVA-Fisher LSD method for all pairwise multiple comparison procedures.

Fig Supplementary 5 (S5)

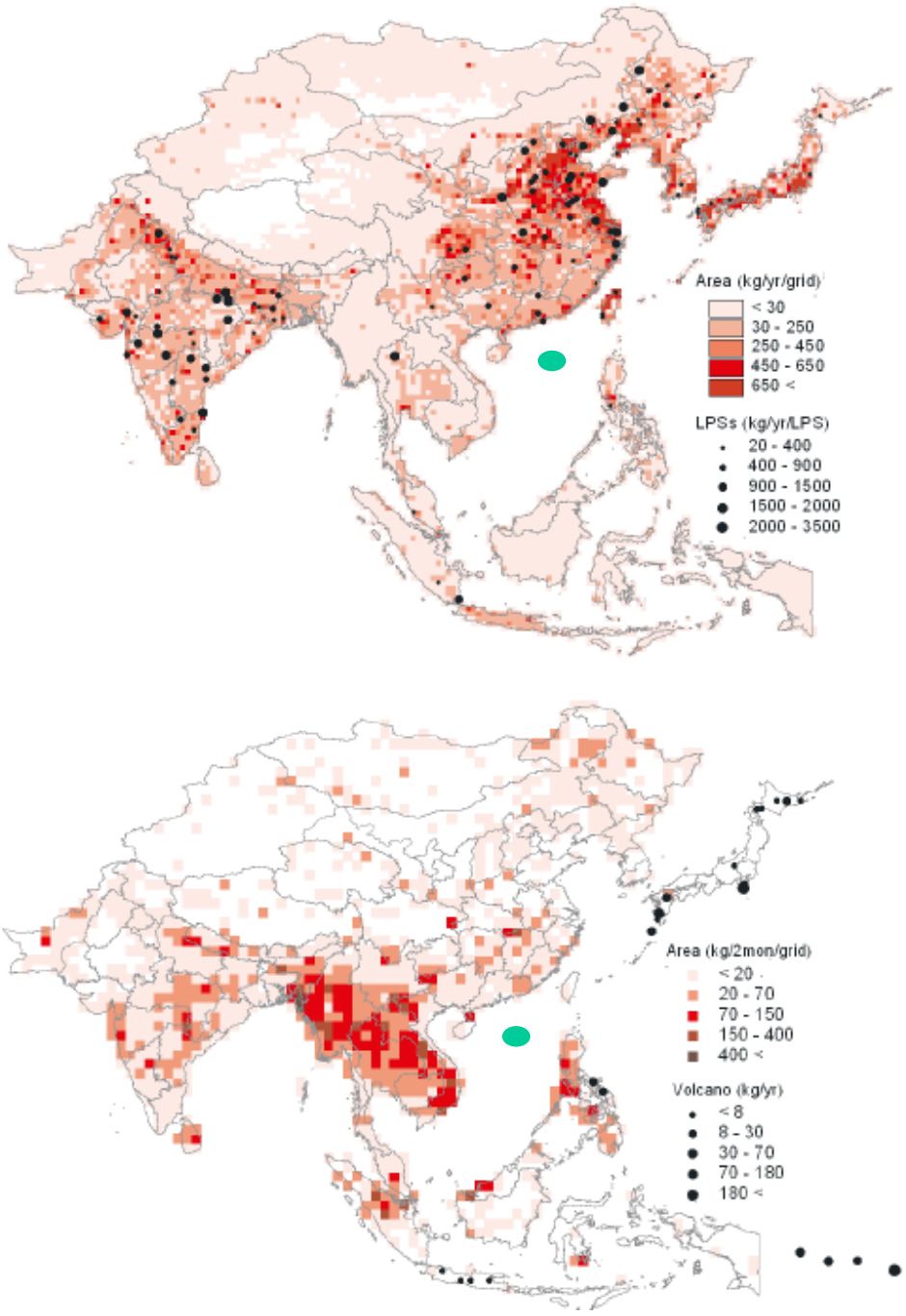


Fig. S5 A map of the mercury source inventory. (top) Spatial distribution of anthropogenic area/point sources and (bottom) biomass burning/volcano sources. The area sources represent emissions per 0.5_ grid per year; the biomass emissions are emissions per 1_ grid per 2 months. (Adopted from Li et al. 2006, JGR). Green dot denotes the SEATS station (circle).