An overview of atmospheric Hg measurements in China

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Regional distributions of anthropogenic Hg emission over the world in 2005

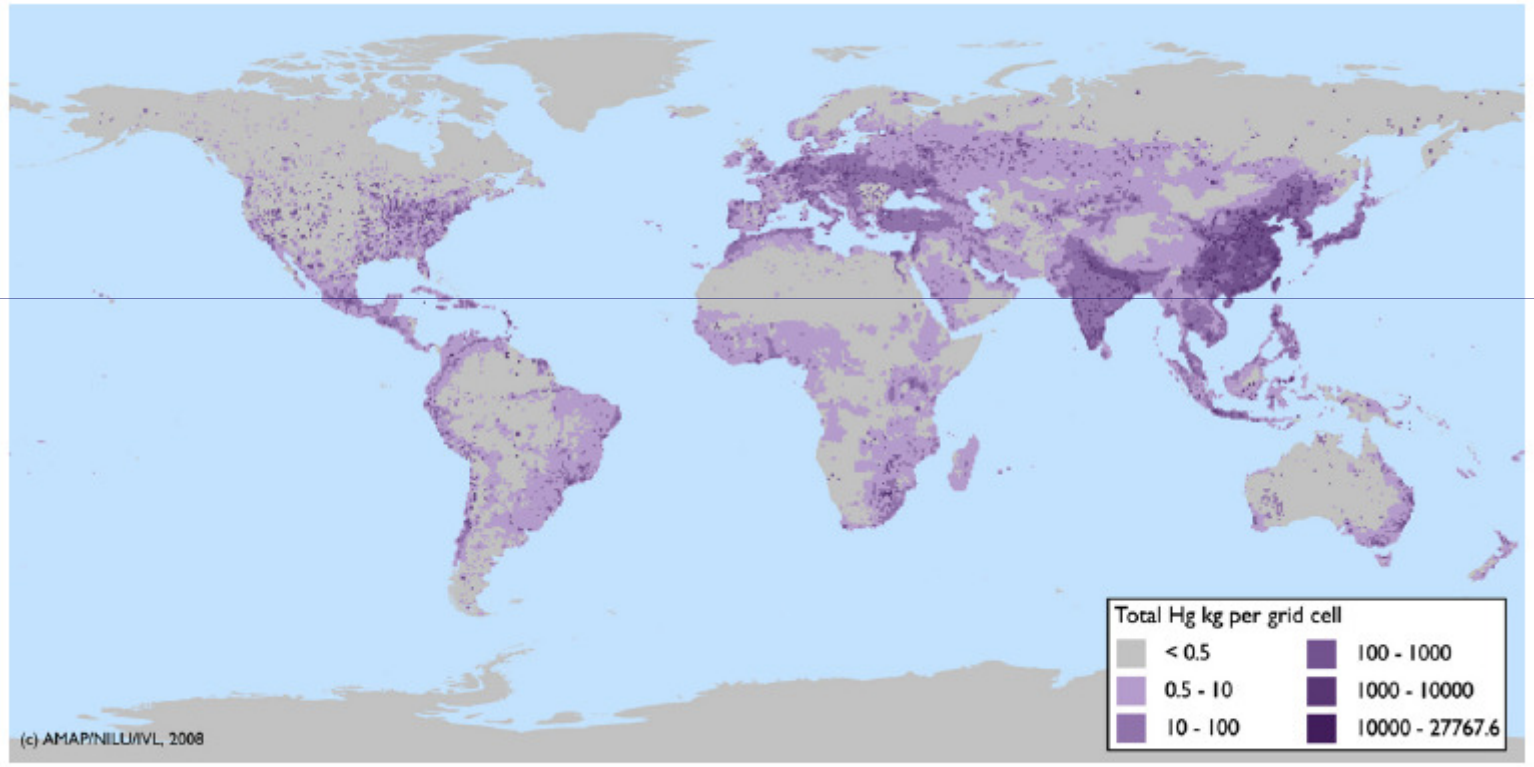


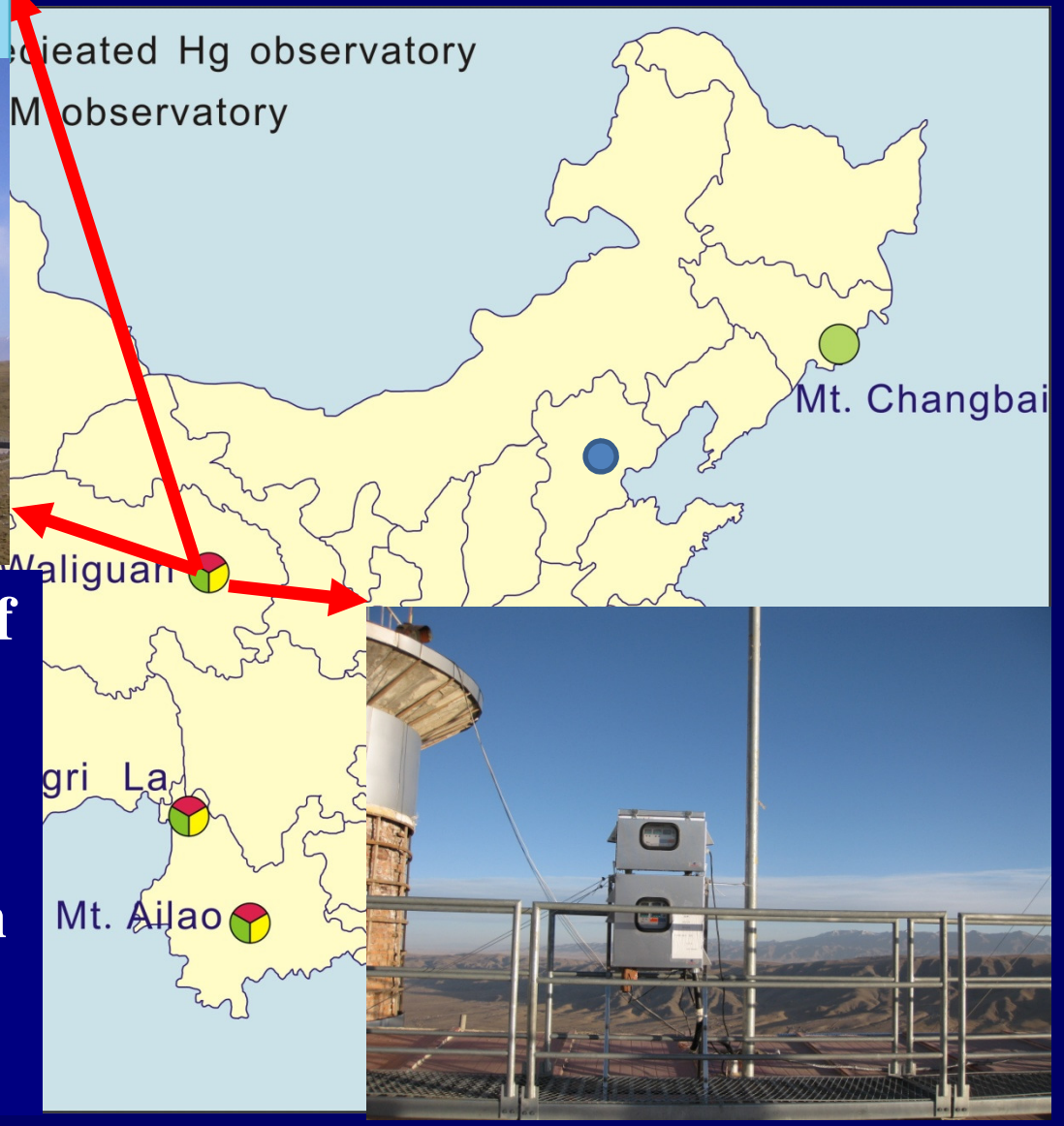
Fig. 6. Global distribution of anthropogenic emissions of mercury in 2005 (AMAP/UNEP, 2008).

Pacyna et al., 2010

Locations of the sampling sites

Mt. Waliguan





Waliguan station is one of the Global Atmosphere Watch (GAW) stations, which located at the northeast edge of Tibetan Plateau with elevation of 3810 m a.s.l.

Locations of the sampling sites

Shangri-La



Shangri-La station is located in the south of China and Southeastern Tibetan Plateau

Lat: 28.017 °

Long: 99.733 °

Elevation: 3600 m a.s.l



Locations of the sampling sites

Mt. Ailao



The site is in the forest of Mt. Ailao, Southwestern China
Lat: 24.320 °
Long: 101.010 °
Elevation: 2450 m a.s.l



Locations of the sampling sites

Mt. Leigong



The site situates at the summit of Mt. Leigong in Guizhou province, Southwestern China, one of most Hg polluted area

Lat: 26.39 °

Long: 108.20 °

Elevation: 2178 m a.s.l



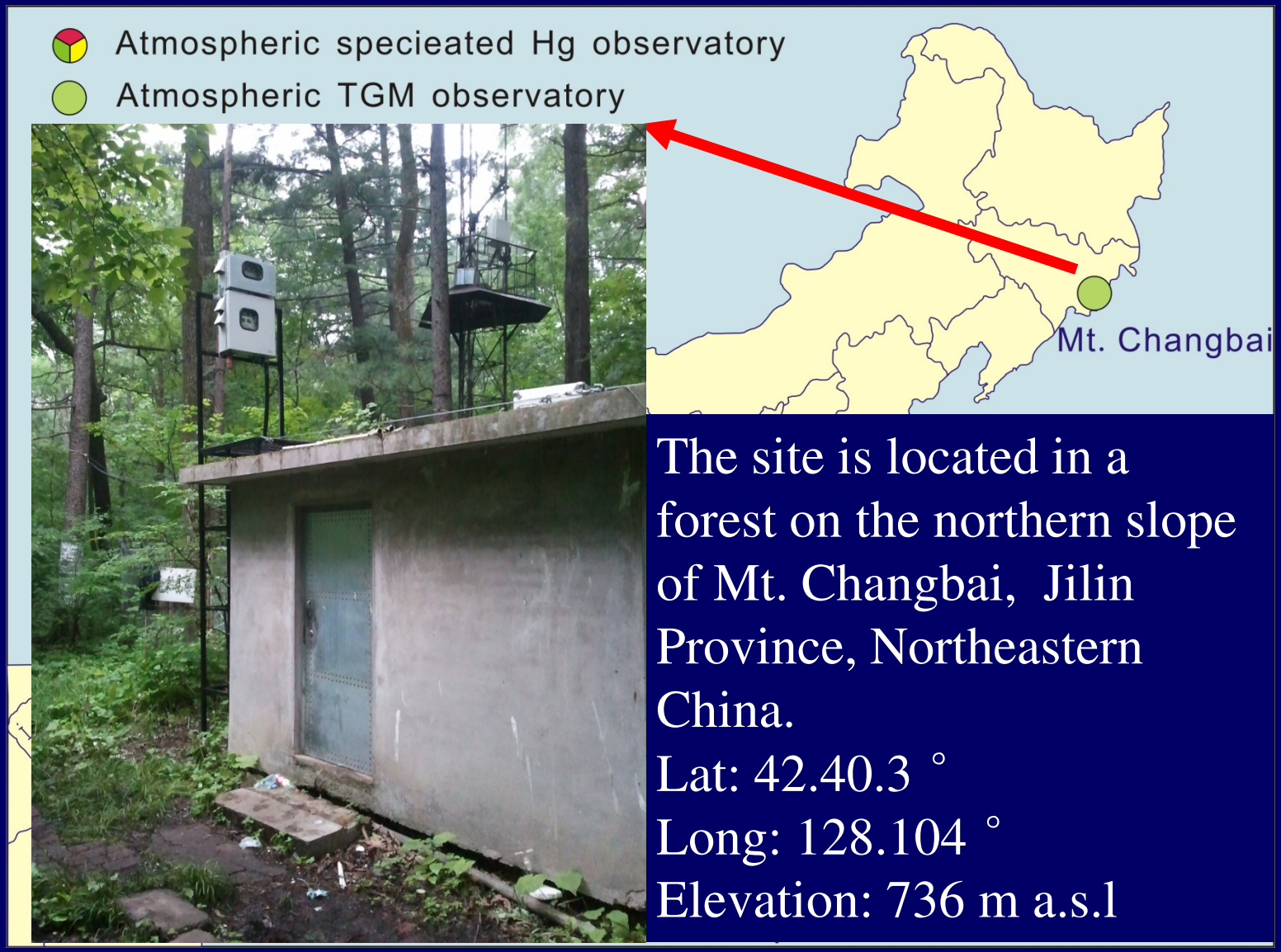
Locations of the sampling sites

Mt. Damei



The site is at the summit of Mt. Damei, Ningbo, in the coastal and most industrialized area of eastern China
Lat: 29.632 °
Long: 121.565 °
Elevation: 550 m a.s.l

Locations of the sampling sites



The site is located in a forest on the northern slope of Mt. Changbai, Jilin Province, Northeastern China.

Lat: 42.40.3 °

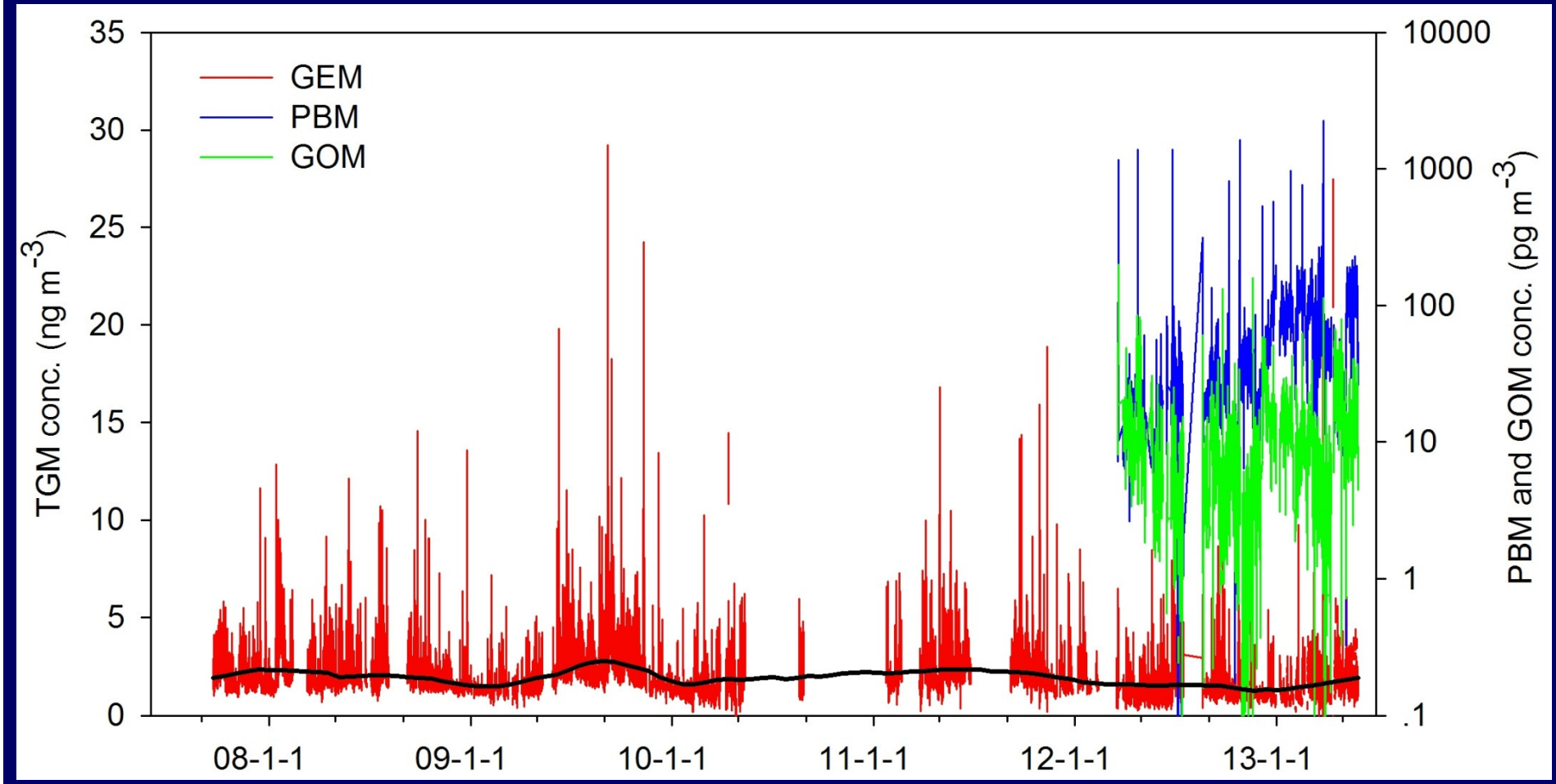
Long: 128.104 °

Elevation: 736 m a.s.l

Observation:

- Mt. Waliguan: TGM, GOM, PBM, and precipitation THg;
- Shangri-La: TGM, GOM, PBM, and precipitation THg;
- Mt. Ailao: TGM, GOM, PBM, and precipitation THg;
- Mt. Leigong: TGM and precipitation THg;
- Mt. Damei: TGM and precipitation THg;
- Mt. Changbai: TGM and precipitation THg

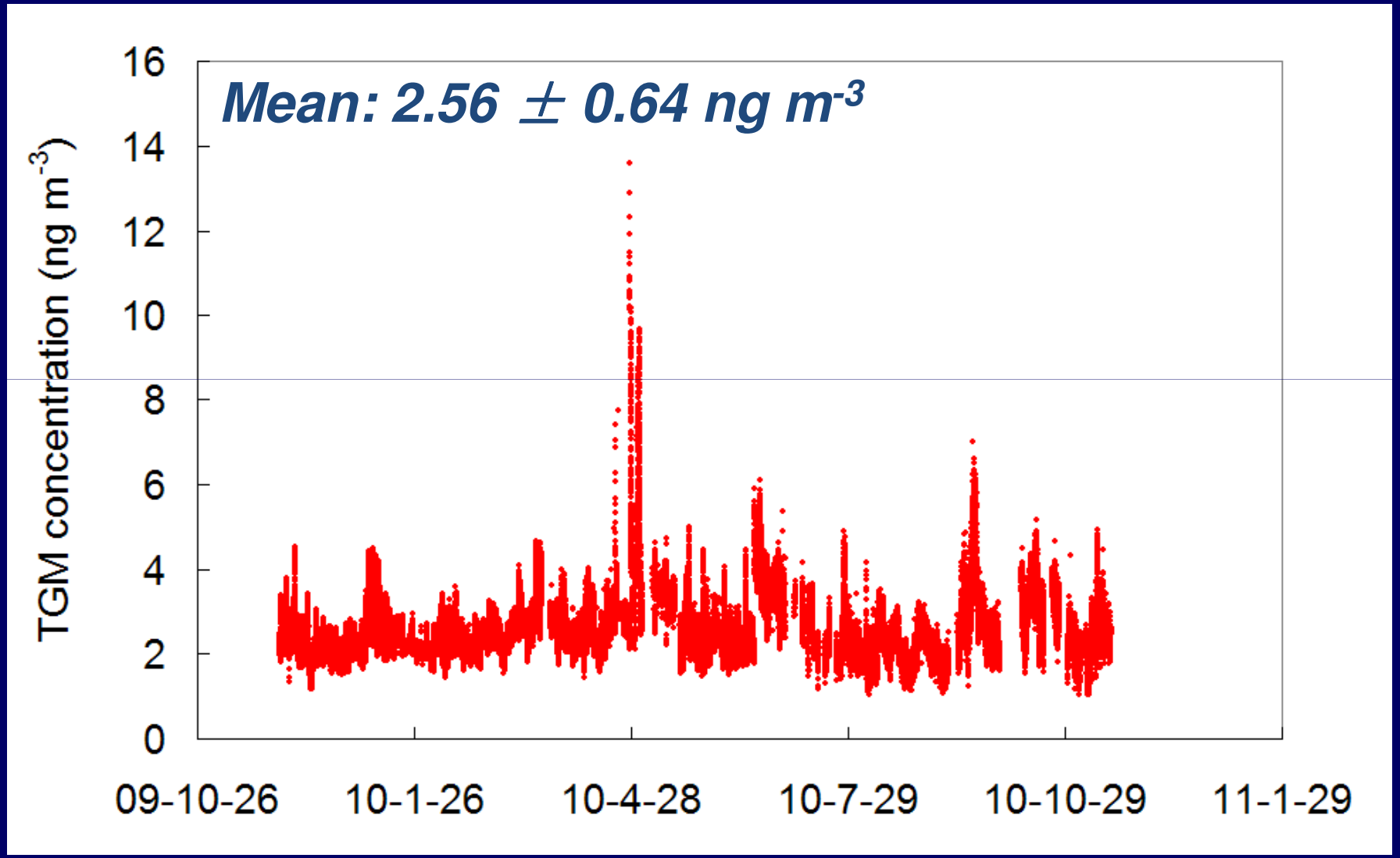
Time series of Hg species at Mt. Waliguan (since Sep 2007)



GEM mean: 1.93±1.01 ng m^{-3}

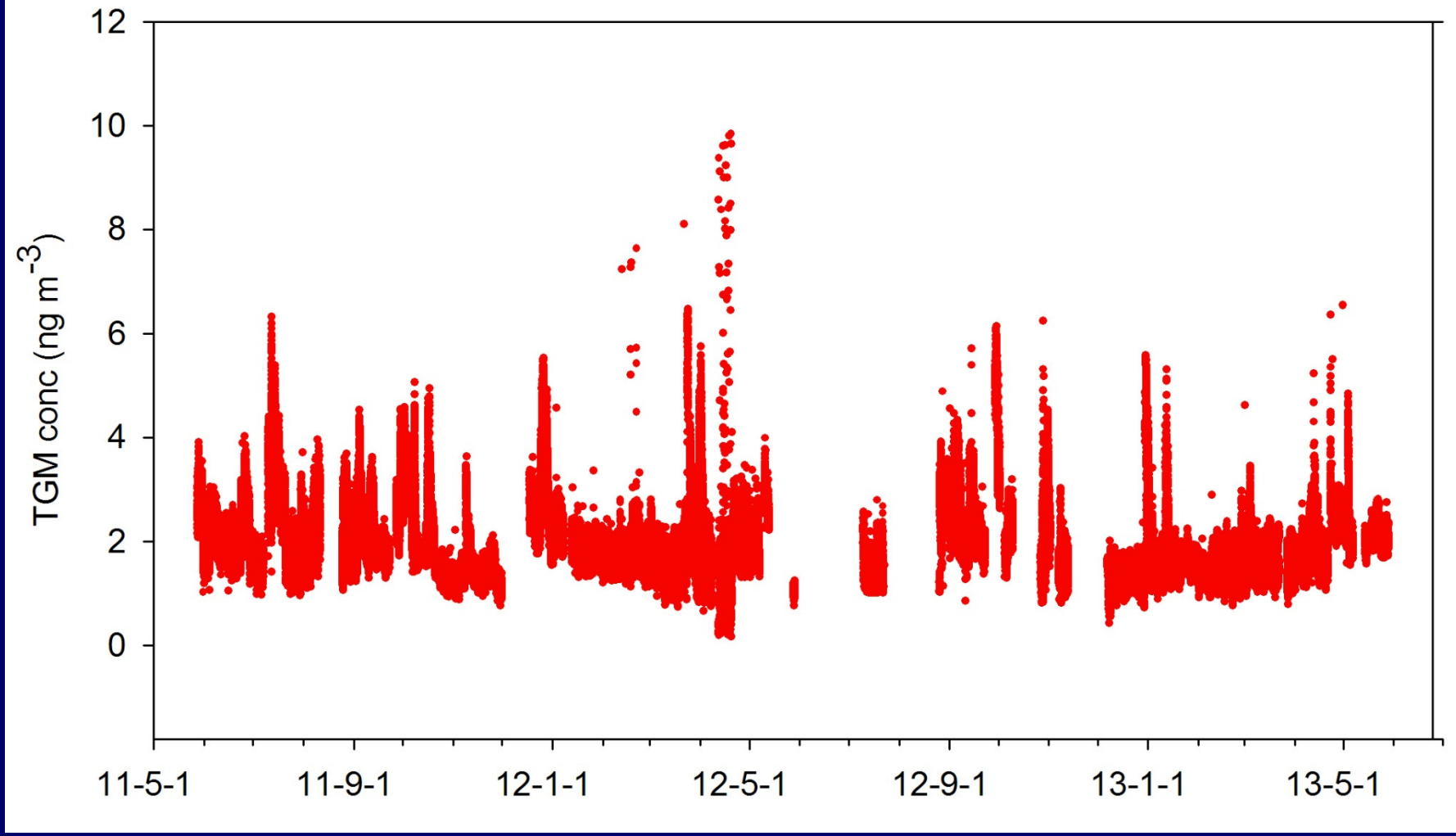
PBM: 50±78 pg m^{-3}; GOM:10±11 pg m^{-3}

Time series of TGM at Shangri-La (Nov 2009- to Nov 2010)

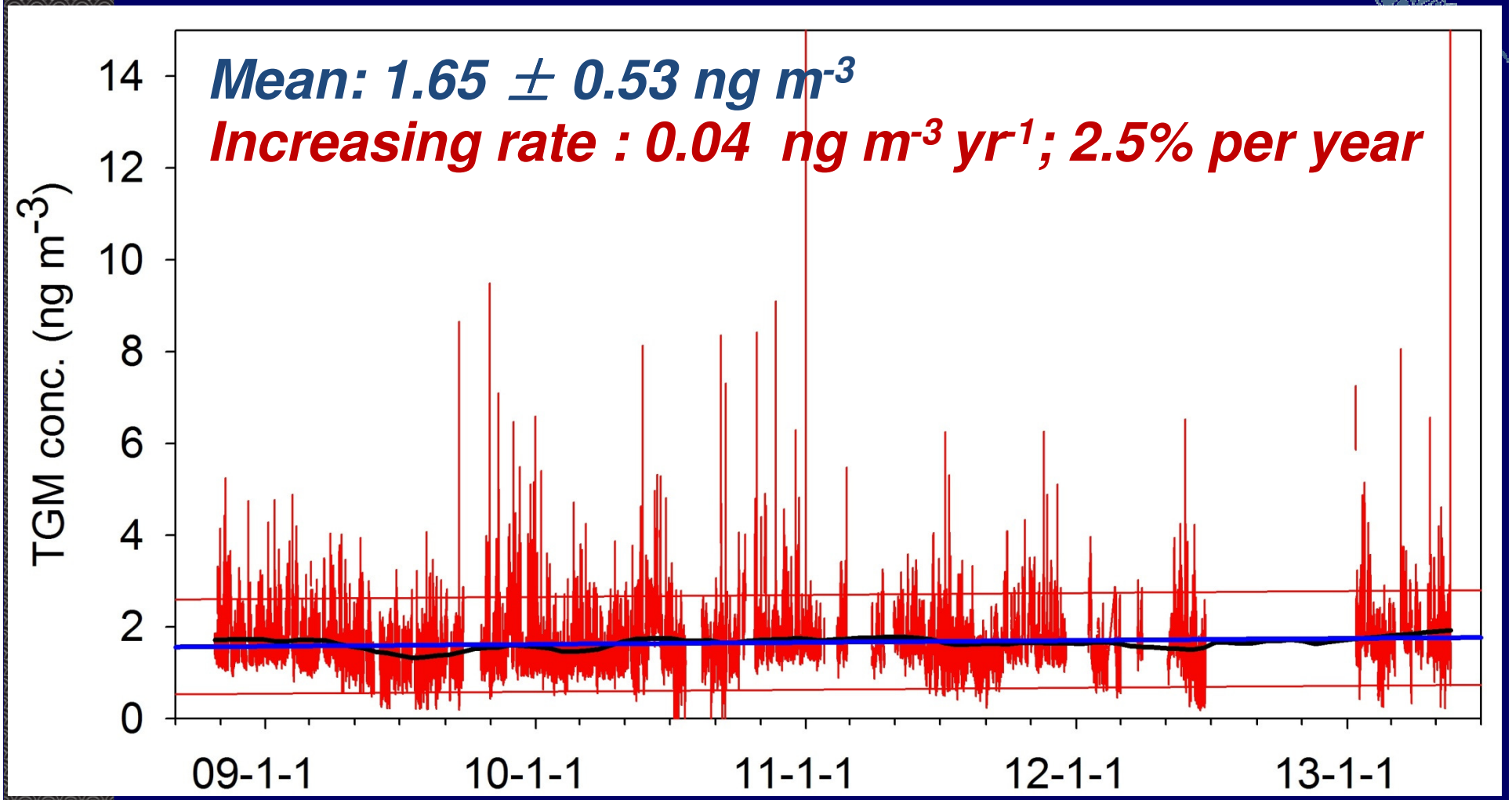


Time series of TGM at Mt. Ailao (Since May 2011)

Mean: 2.13±0.65 ng m^{-3}



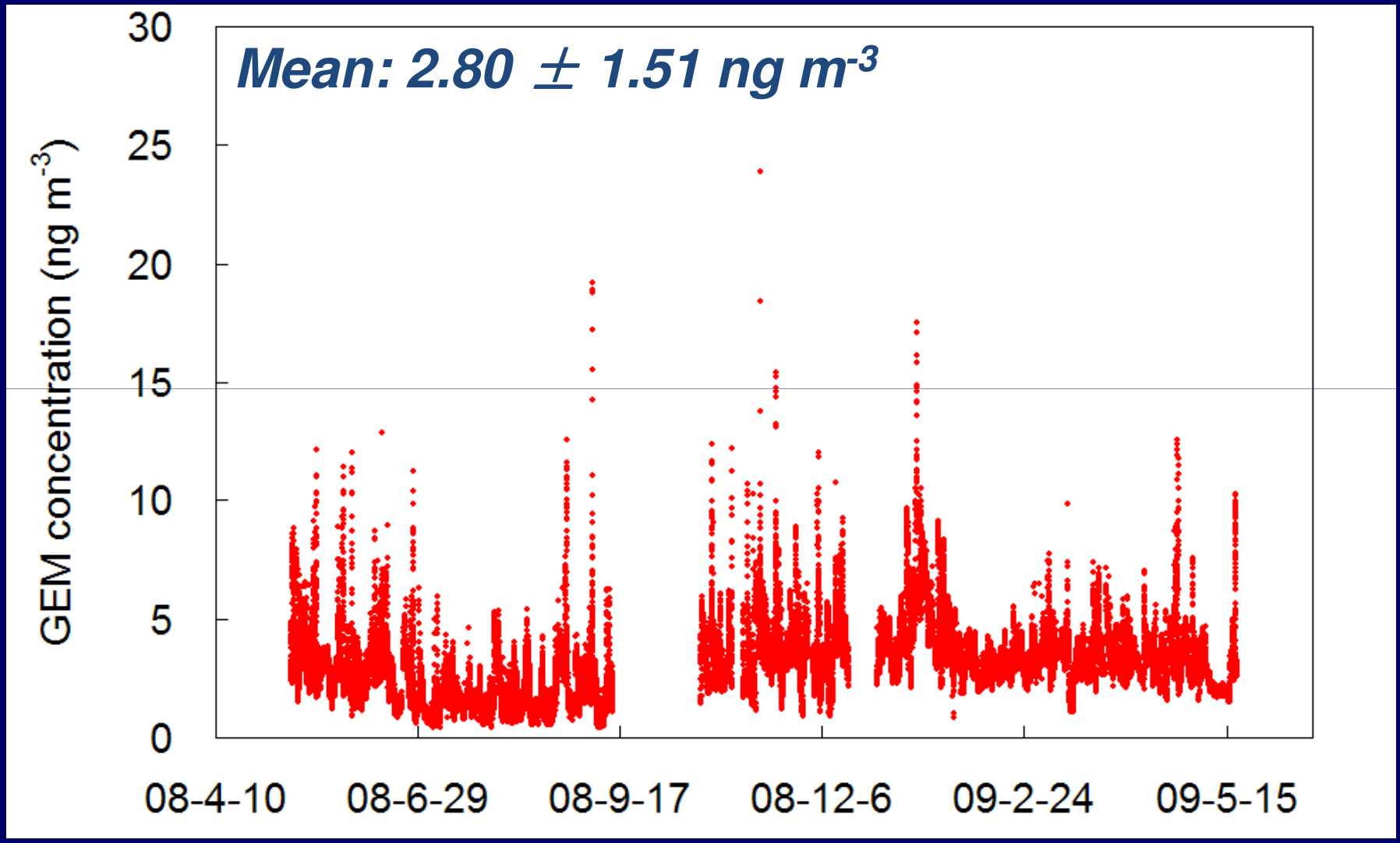
Time series of TGM at Mt. Changbai (Since Oct 2008)



Lowest level among the six stations

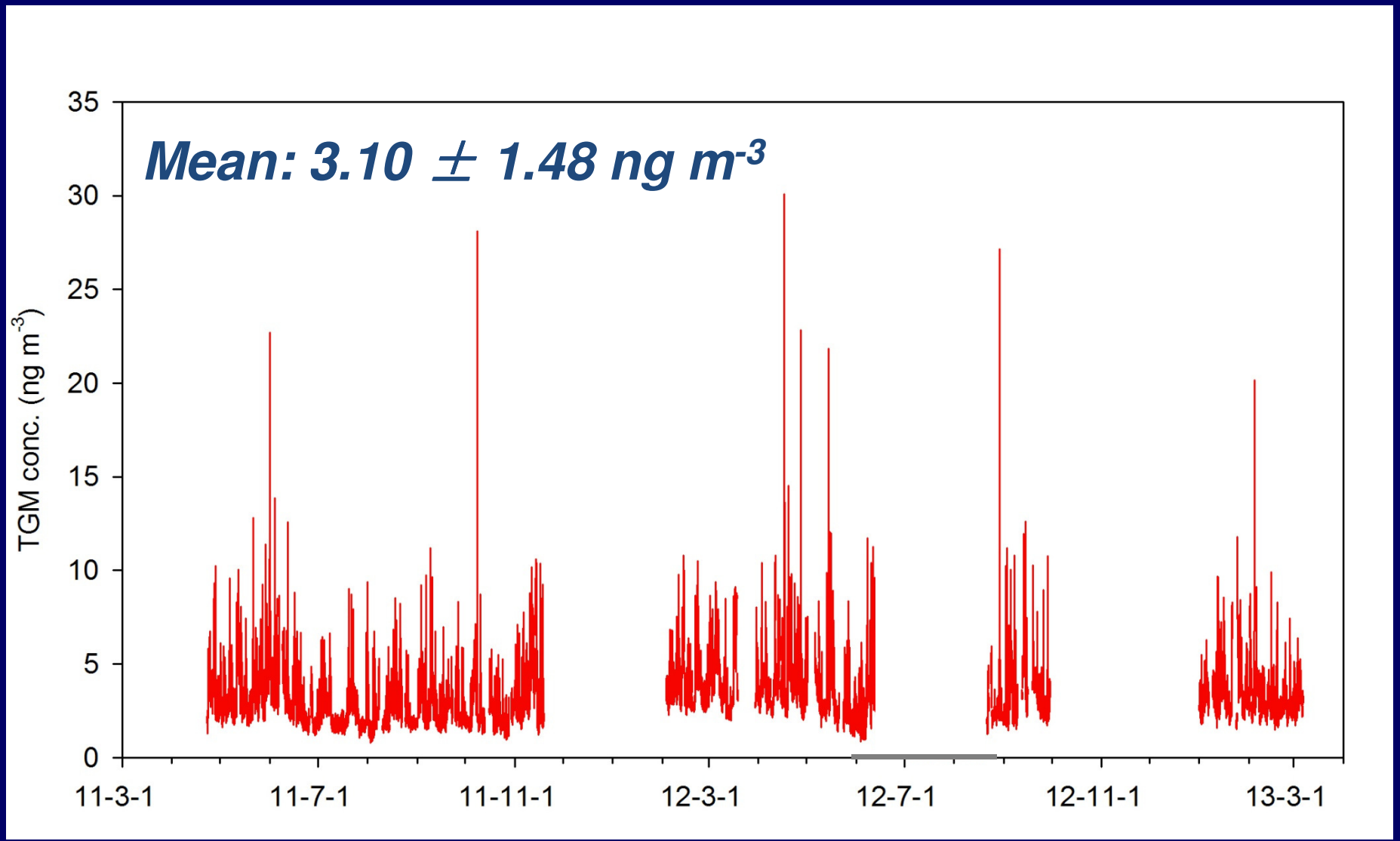
(Fu et al., 2012)

Time series of TGM at Mt. Leigong (May 2008 to May 2009)



Fu et al., 2010

Time series of TGM at Mt. Damei (Since Apr 2011)

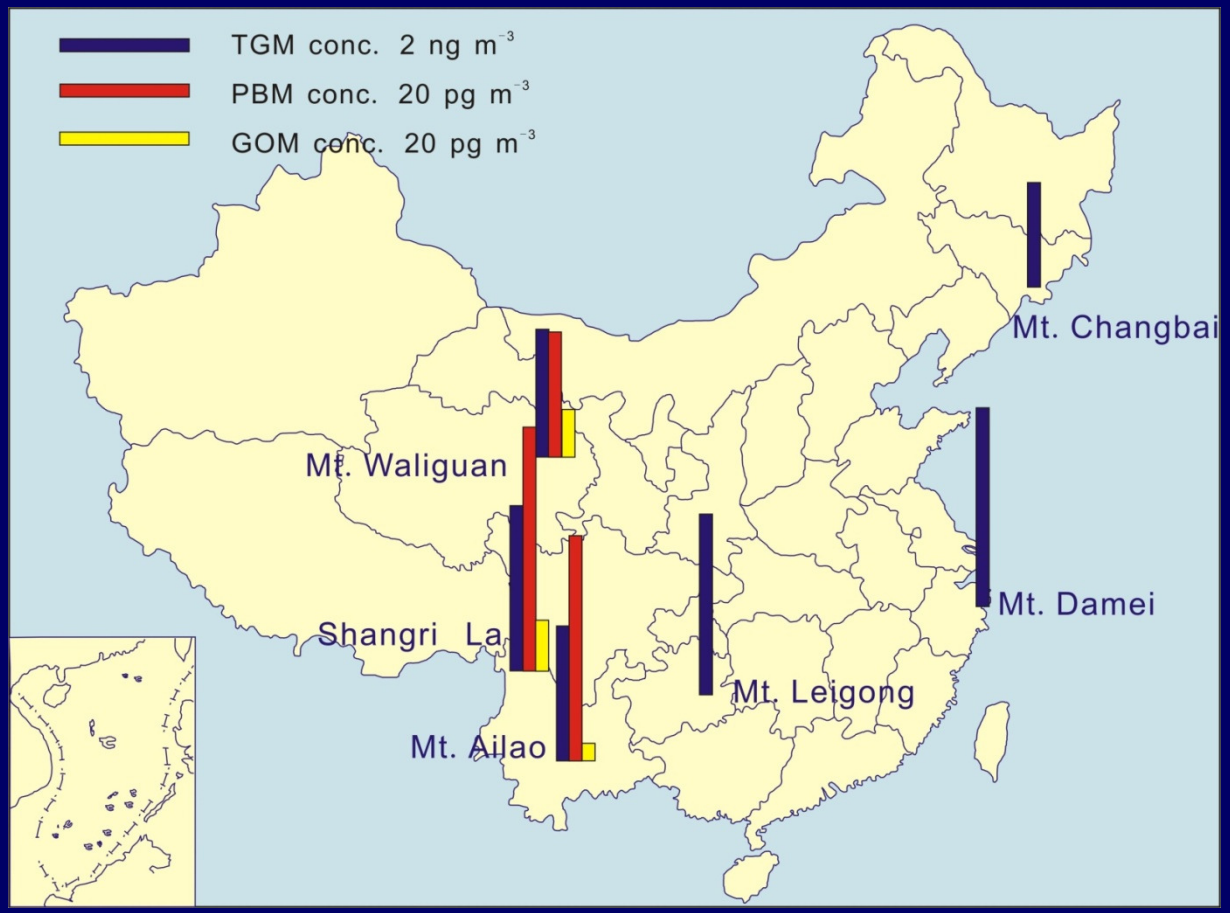


Highest TGM background level

Statistical summary of atmospheric Hg species in remote areas of China

Site	TGM (ng m^{-3})	GOM (pg m^{-3})	PBM (pg m^{-3})
Mt. Waliguan	1.93±1.01	10 ± 11	50 ± 78
Mt. Ailao	2.13±0.65	3 ± 3	35 ± 30
Shangri-La	2.56±0.64	8 ± 8	38 ± 31
Mt. Changbai	1.65±0.53		
Mt. Leigong	2.80±1.51		
Mt. Damei	3.10±1.48		

Spatial distribution of atmospheric background Hg in China

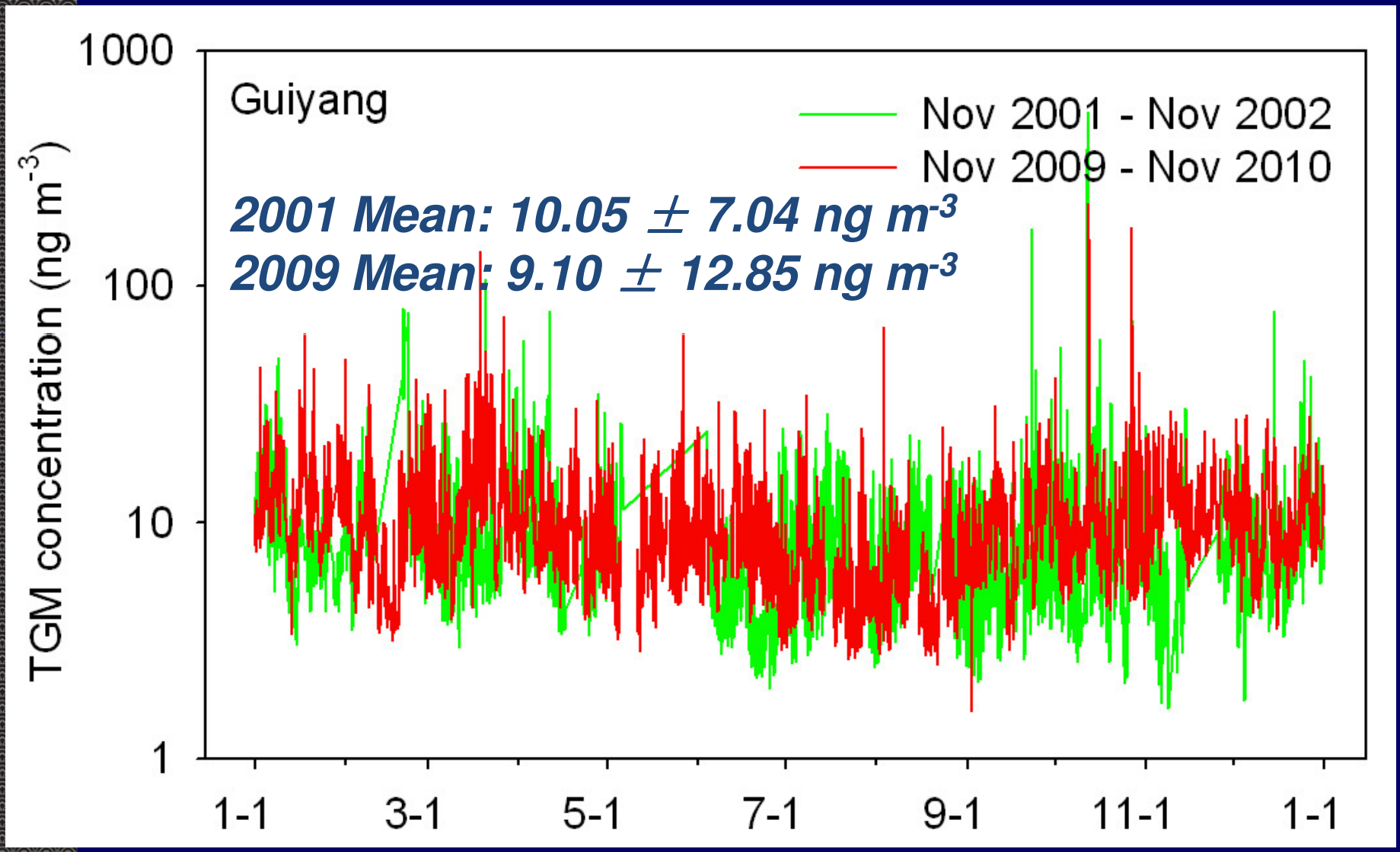


Atmospheric Hg showed a clear spatial distribution pattern in China, with relatively higher TGM concentrations in South and East China. This corresponds very well with the estimates of anthropogenic Hg emissions in China.

TGM in Guiyang City-Southwestern China



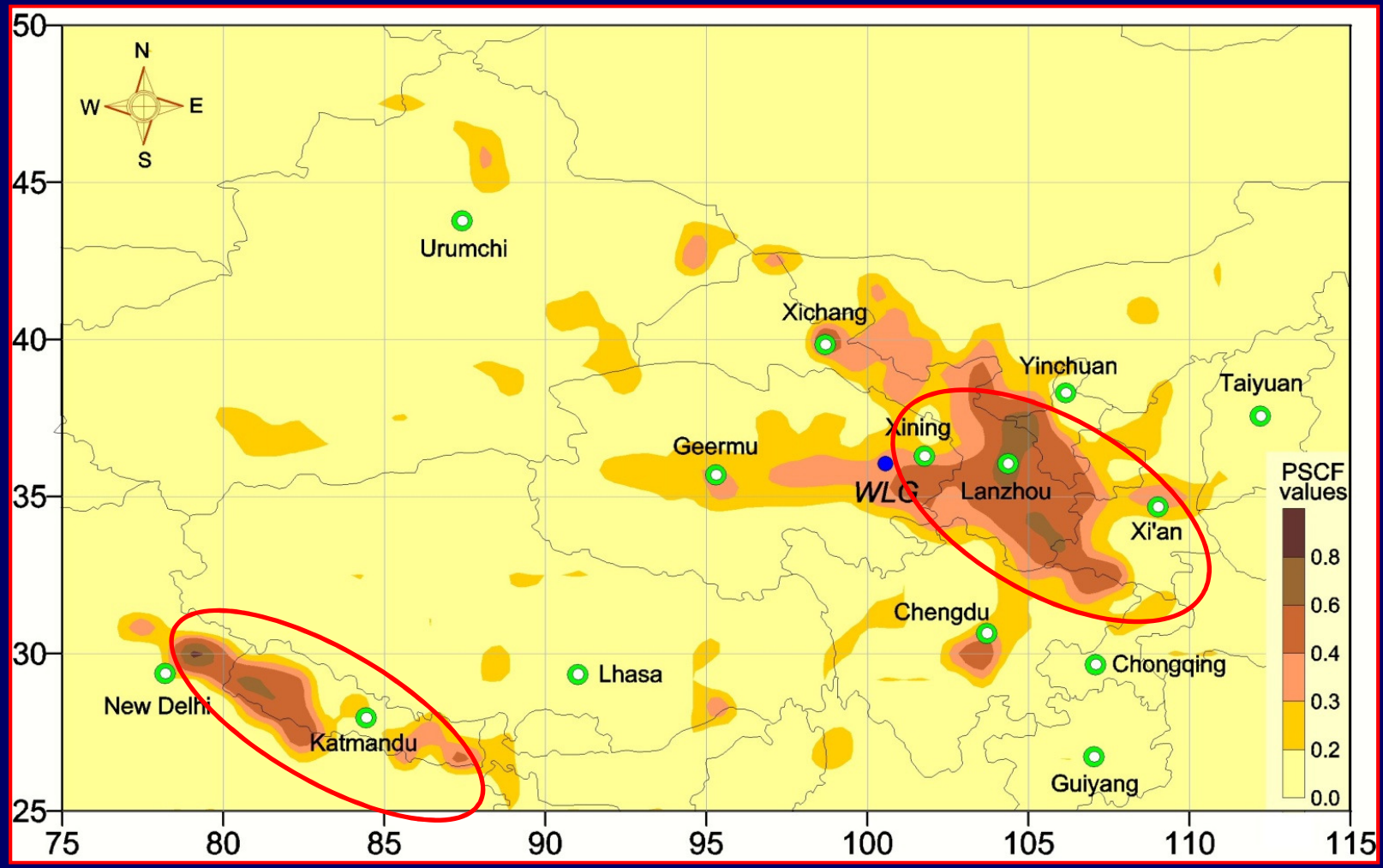
Time series of TGM at Guiyang city (2001 &2009)



Source identification—

A case study at Mt. Waliguan, Mt. Changbai, and Guiyang city

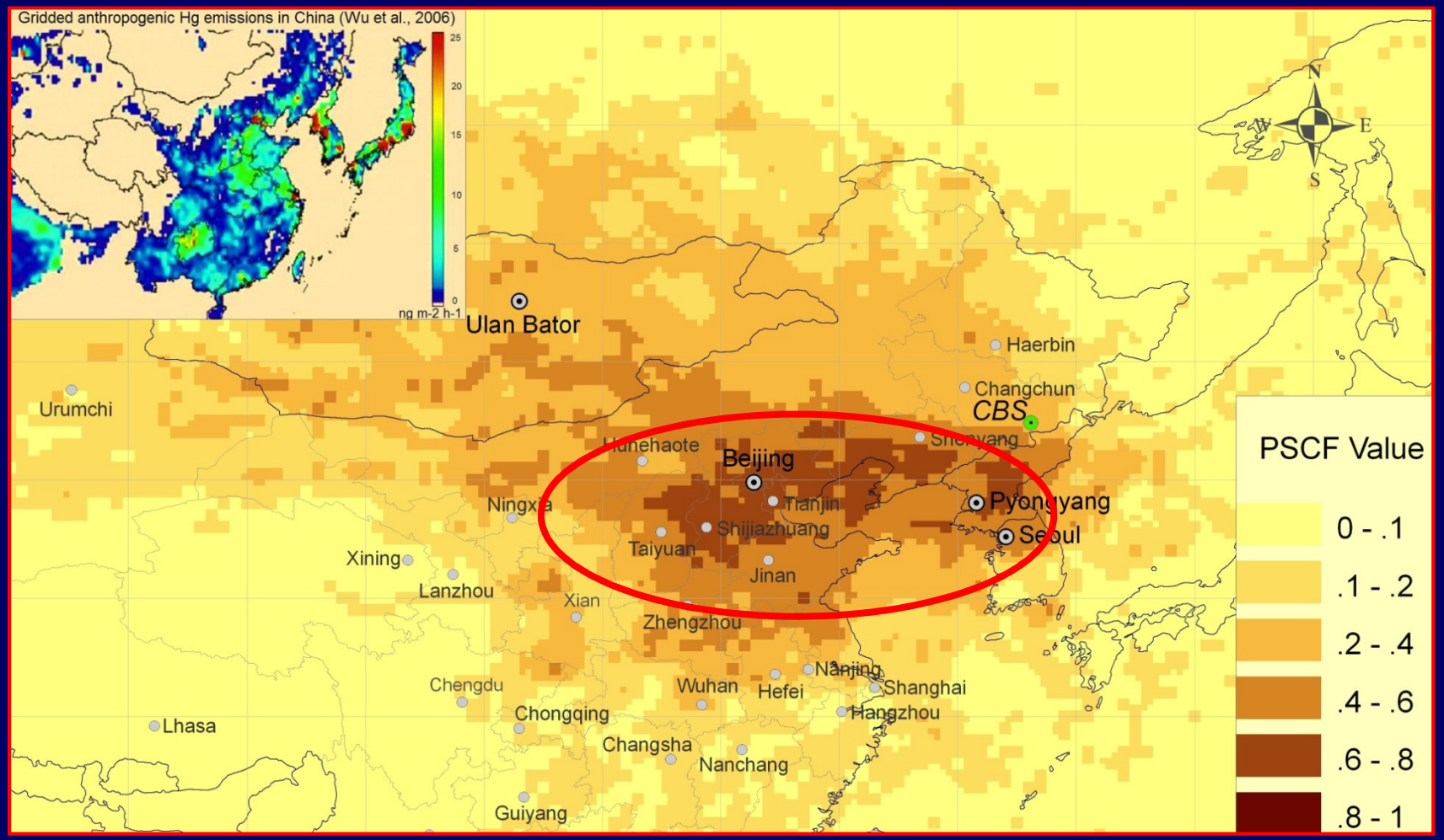
Potential source areas of atmospheric Hg at Mt. Waliguan



(Fu et al., 2012)

Eastern Tibetan Plateau and North India

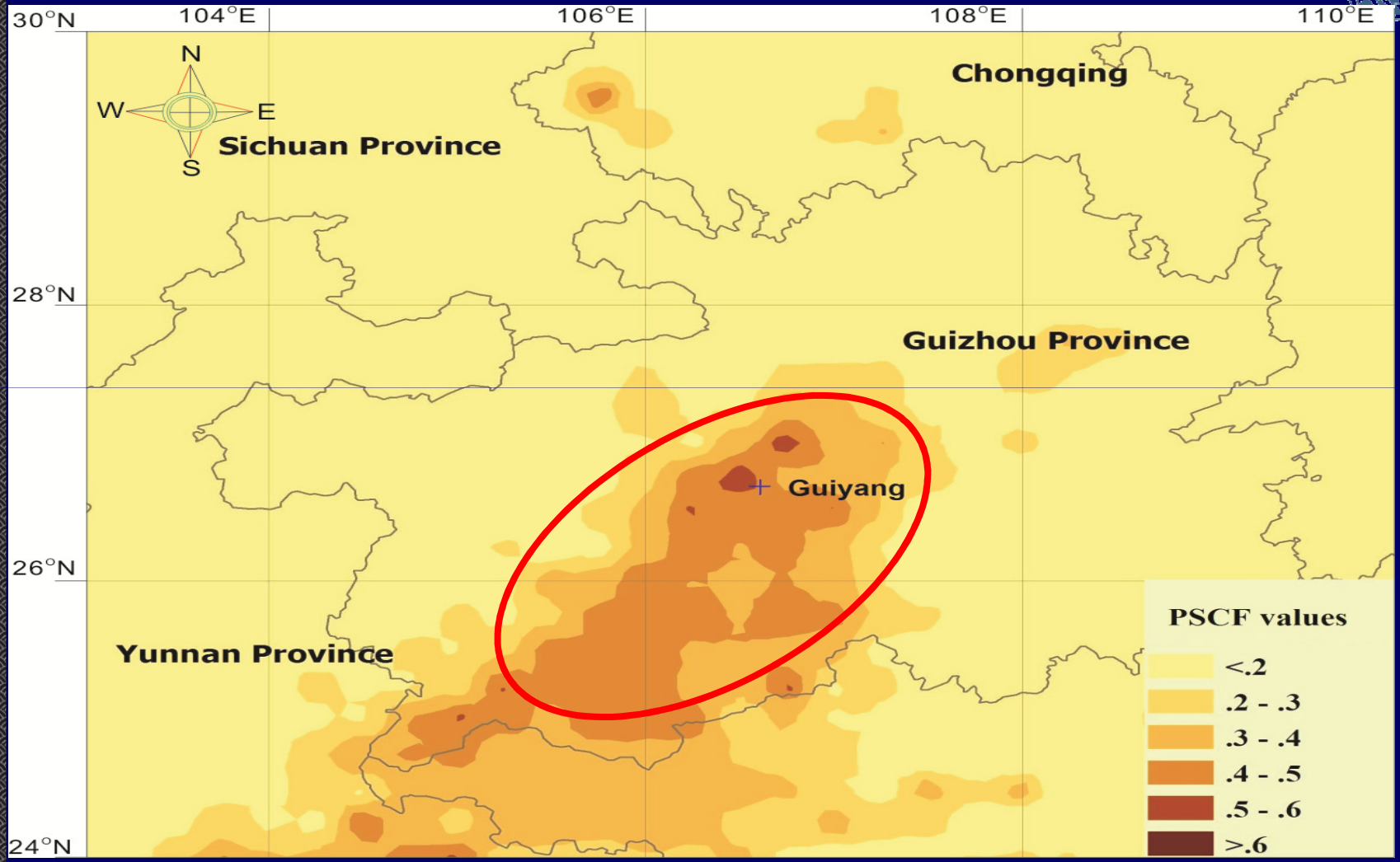
Potential source areas of atmospheric Hg at Mt. Changbai



North China: one of the most industrialized and urbanized area

(Fu et al., 2012)

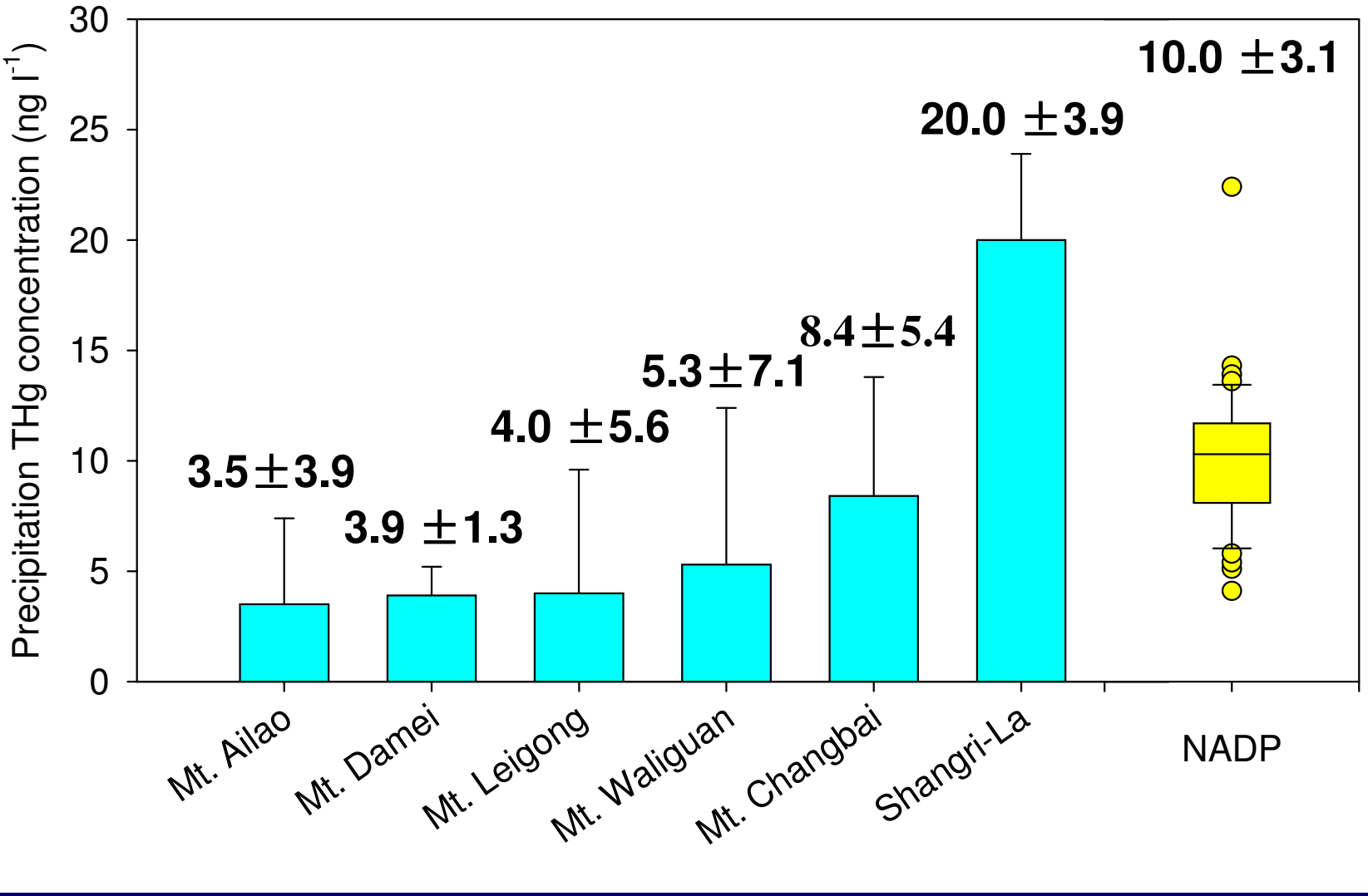
Potential source areas of atmospheric Hg at Guiyang city



West of Guiyang and southwest of Guizhou: Industrial regions

(Fu et al., 2011)

Precipitation Hg concentrations at remote sites of China



Conclusions:

1. Atmospheric Hg was continuously monitored at 6 remote sites in China. The Levels of TGM and PBM were higher than those reported from Northern Hemisphere, and GOM concentrations were comparable to those in Northern Hemisphere.

2. Regional sources played an important role in the spatial distributions of atmospheric Hg in China. High levels of atmospheric Hg were observed from sites close to industrial and urbanized regions of China.

3. THg concentrations in precipitation were comparable and/or slightly lower than those observed from US MDN monitoring network. This does not correspond well to the elevated atmospheric Hg levels in China.

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Thanks for you attention!

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