Update on recent mercury monitoring activities in Japan

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Monitoring Sites

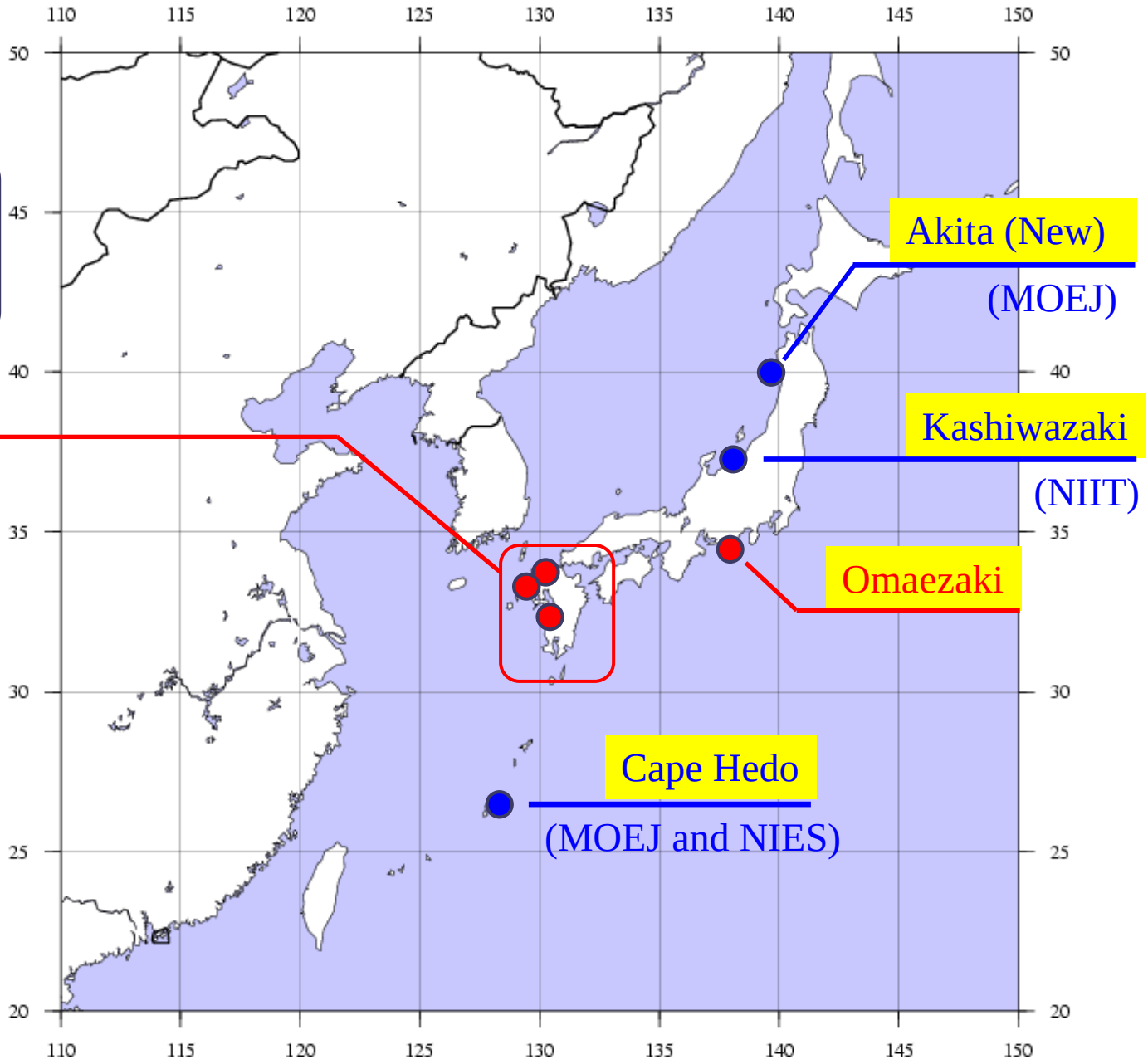
- NIMD
- Others

Kyushu 3 sites

Fukuoka

Hirado

Minamata



Objectives of our activities:

- Monitoring current levels of mercury (Hg) in air, airborne particles and precipitation;
- To obtain long term trend on wet and dry deposition fluxes of Hg in Japan;
- To obtain useful information on the long-range transportation of Hg in Asia-Pacific region;
- Development of monitoring methodologies and technologies;
- To contribute to international efforts in atmospheric Hg monitoring

Mercury observation sites by NIMD	**Minamata**	**Hirado**	**Fukuoka**	**Omaezaki (Shizuoka)** December 2013 Start
Continuous monitoring for atmospheric Hg	TGM using NIC Hg monitor Since March 2011		GEM, GOM and PBM(<2.5μm) using TEKRAN Since March 2012	
Manual sampling for GEM, GOM and PBM(<2.5μm)	6 or 8 days a month (semi-diurnal) Until Dec., 2013	6 or 8 days in each season (semi-diurnal) Until May 2014		
Weekly sampling (4 times a month) (Sampling is carried out at every Tuesday since December, 2013.)	Wet deposition (T-Hg, MMHg) PBM (Total) in the air using FP method* Since Sep., 2008	Wet deposition (T-Hg) PBM (Total) in the air using FP method* Since June 2011	Wet deposition (T-Hg) PBM (Total) in the air using FP method* Since June 2013	Wet deposition (T-Hg) PBM (Total) in the air using FP method* Since Dec., 2013
Others	Meteorological parameters CO	Meteorological parameters	Meteorological parameters Collaboration with other organizations	Meteorological parameters

* FP method : Filter Pack method

Mercury observation sites by Others	Hedo, Okinawa (MOEJ and NIES)	Akita (MOEJ)	Kashiwazaki (NIIT)
Continuous monitoring for atmospheric Hg	GEM, GOM and PBM(<2.5μm) using TEKRAN Since October 2007	GEM, GOM and PBM(<2.5μm) using TEKRAN From Sep, 2014	GEM, GOM and PBM(<2.5μm) using TEKRAN Since July 2010
Manual sampling for GEM, GOM and PBM(<2.5μm)			Hg analysis have been carried out by NIMD.
Weekly sampling	Wet deposition (T-Hg) Since April 2008	Wet deposition (T-Hg) From Sep, 2014	Wet deposition (T-Hg) PBM (Total) in the air using FP method* From July, 2014
Others	Meteorological parameters Collaboration with other organizations	Meteorological parameters	Meteorological parameters

* FP method : Filter Pack method

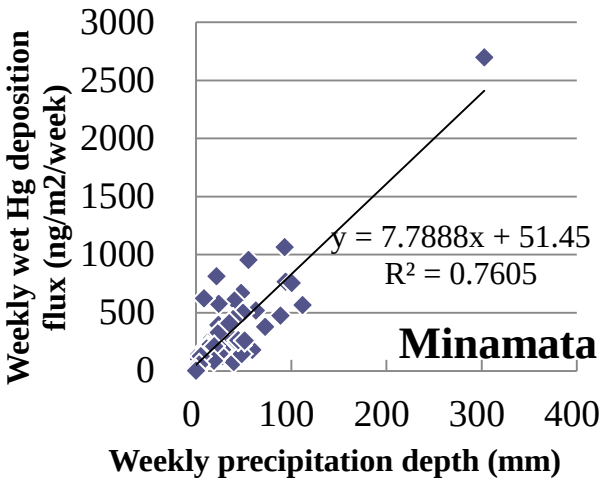
Wet Hg deposition fluxes at 5 sites in Japan (1)

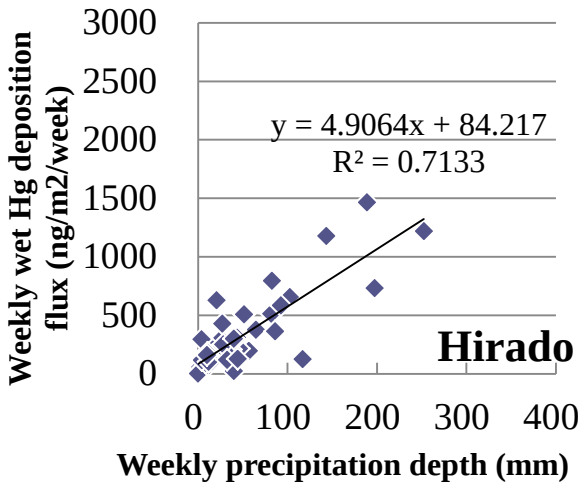
From May 2014 to April 2015 (preliminary data)

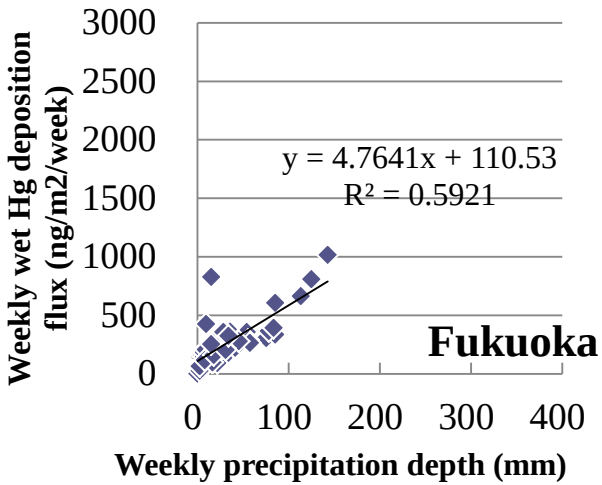
Site	VWM conc. (ng/L)	Annual wet Hg deposition (μg/m2/yr)	Annual rainfall (mm)
Minamata	9.1	18.31	2014
Hirado	6.8	14.45	2139
Fukuoka	7.8	12.13	1550
Omaezaki	6.7	12.48	1873
Kashiwazaki *	6.6	18.74	2832

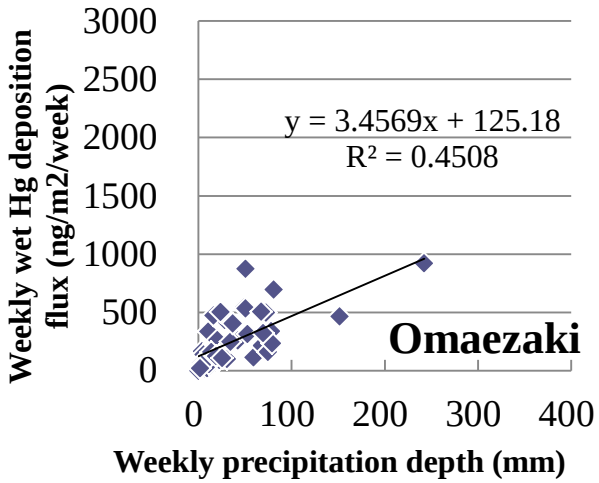
* From July 2014 to April 2015 (10 months)

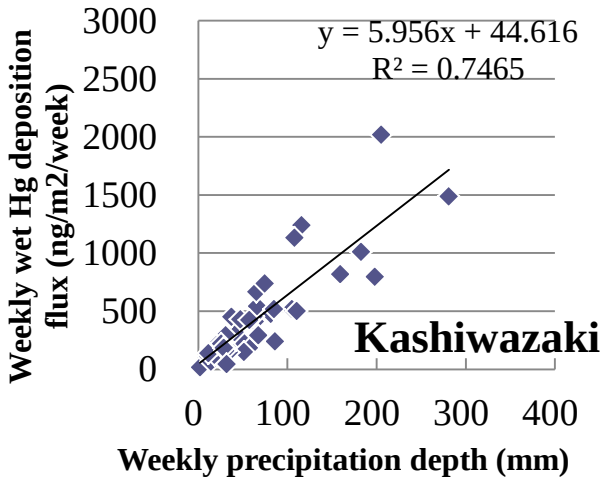
Wet Hg deposition fluxes at 5 sites in Japan (2)



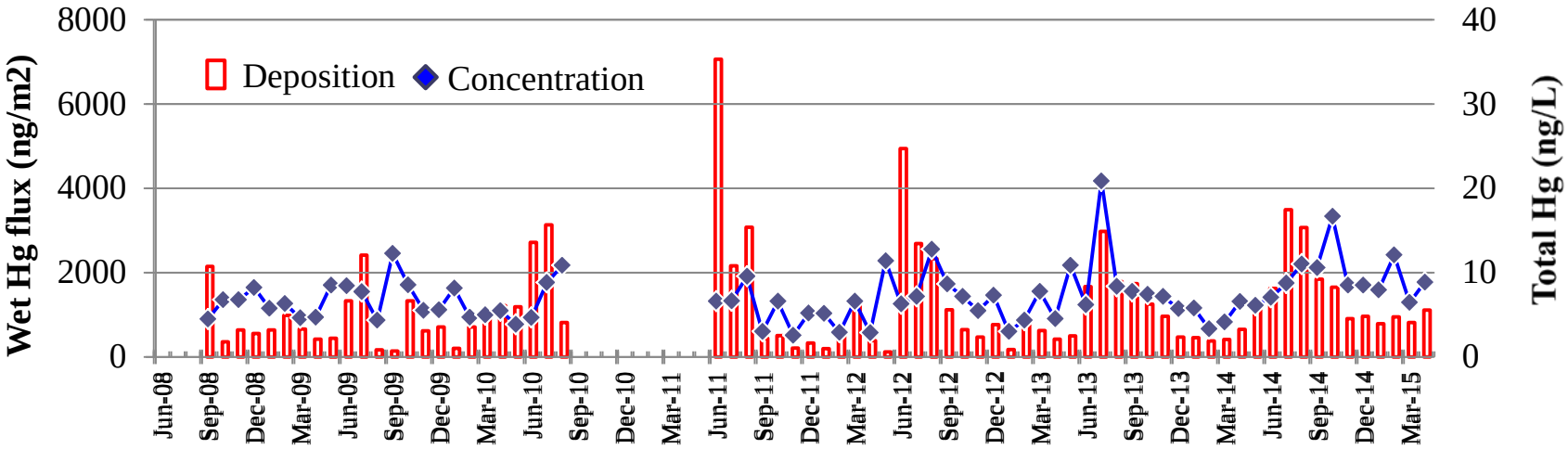






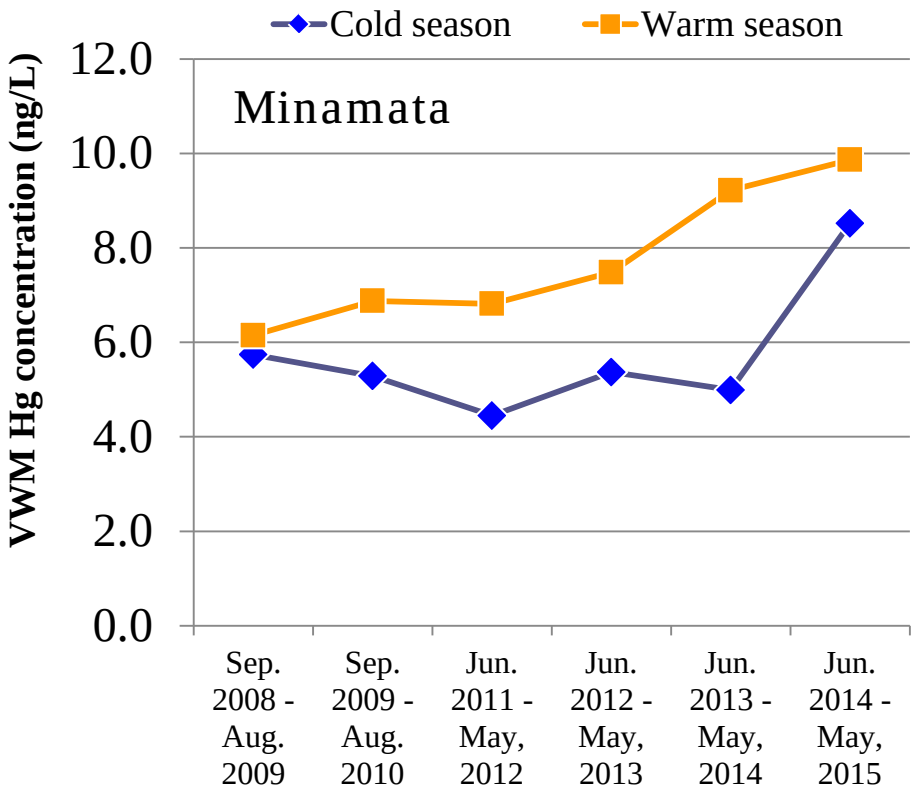


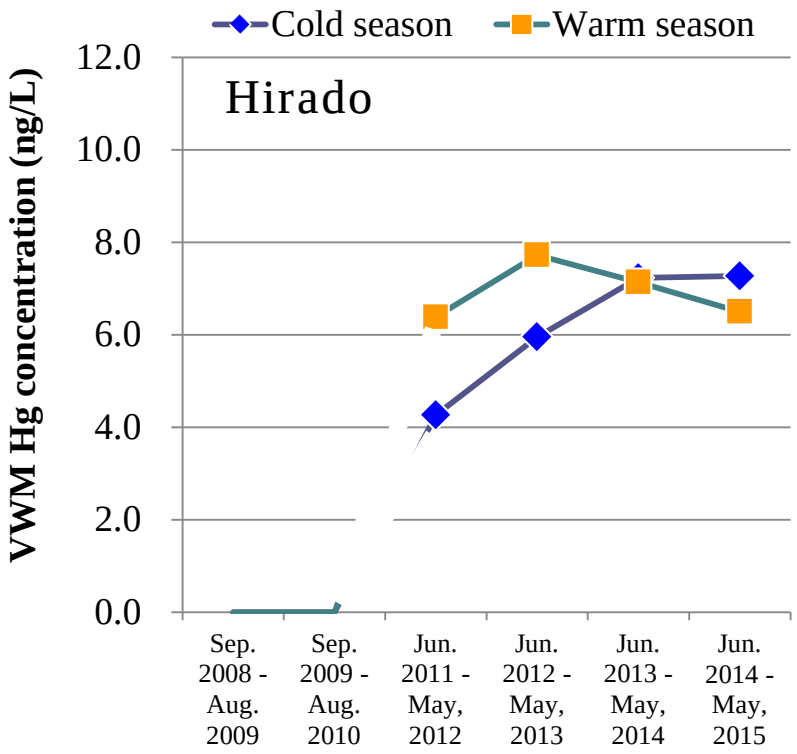
Annual trend of Wet Hg deposition fluxes at Minamata



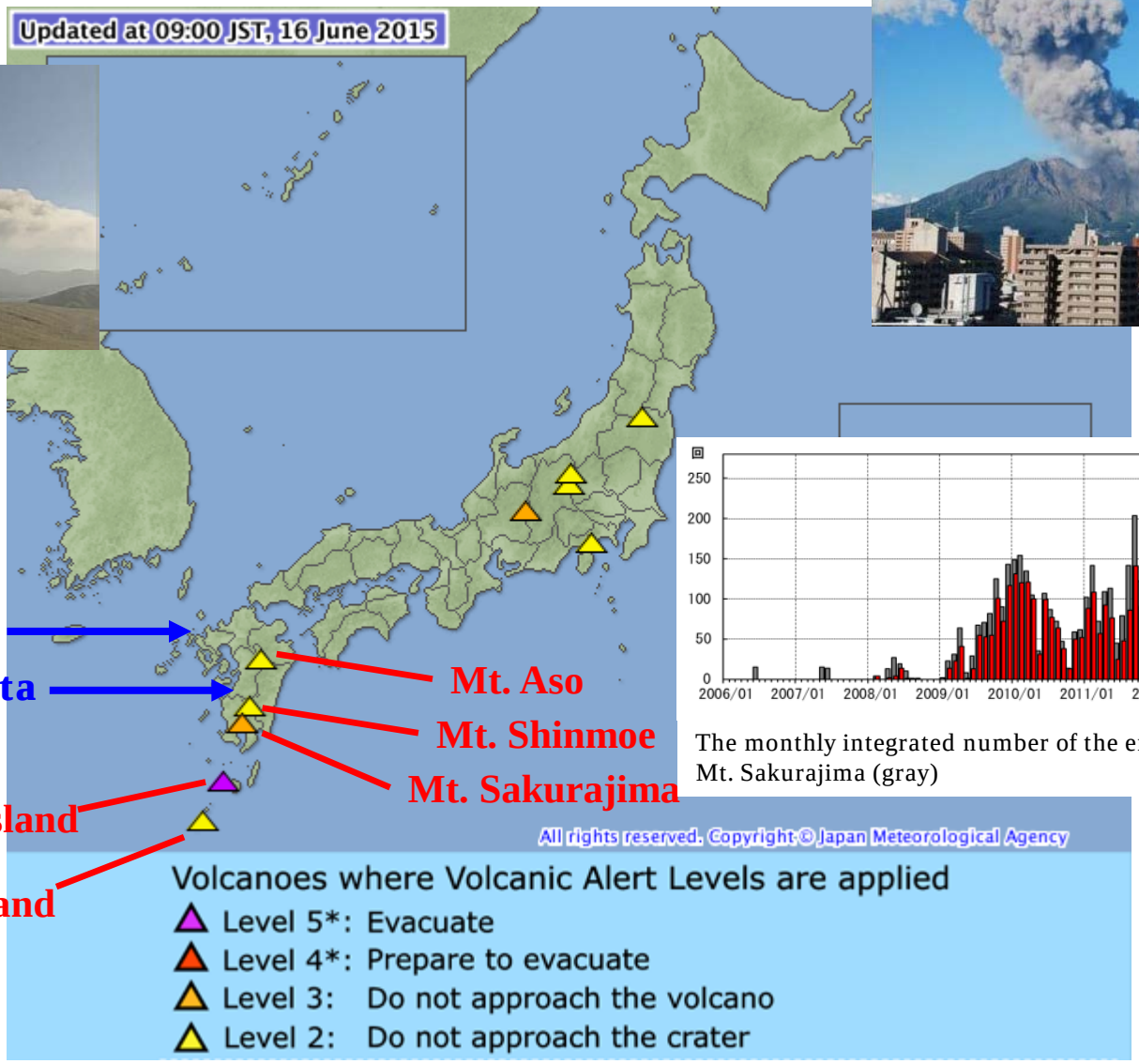
Observational duration	VWM concentration (ng/L)	Annual Precipitation (mm)
September 2008 – August 2009	6.1	1755.0
September 2009 – August 2010	5.9	2306.8
June 2011 – May 2012	6.1	2663.1
June 2012 – May 2013	7.0	2205.3
June 2013 – May 2014	7.6	1810.7
June 2014 – April 2015 (11 months)	9.4	1832.4

Seasonal variation of VWM Hg concentration at Minamata and Hirado





The volcanos in Kyushu islands are active in these days !



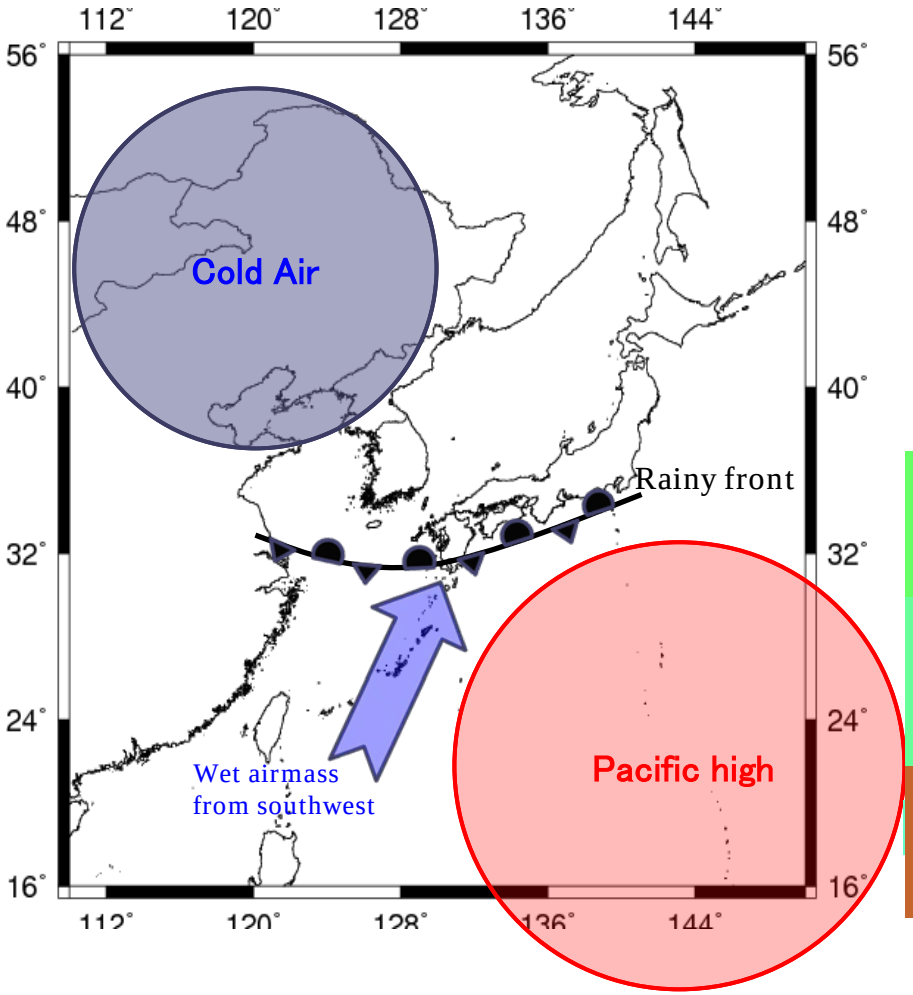
The monthly integrated number of the eruption from Mt. Sakurajima (gray)

Summary of today's talk:

- The latest data on annual volume-weighted mean Hg concentrations in the wet depositions at five sites in Japan were presented. The VWM concentrations were around 7 ng/L except for Minamata.

- The annual VWM concentrations at Minamata increased in recent years. In addition, the significant increase was observed during the warm season (From June to October) in 2013 and 2014 and the cold season from December 2014 to April 2015.

- Minamata is located near the volcanos which is more active in these days. Thus, one possible explanation of the increase of VWM Hg concentrations was volcanic activities in the southern Kyushu islands.



Vertical distribution of troposphere