

# EANET

## ACID DEPOSITION MONITORING NETWORK IN EAST ASIA



## Summary of Fact Sheet of the Acid Deposition Monitoring Network in East Asia (EANET)

### What's EANET?

- EANET is an intergovernmental network, operating since 2001 to address acid deposition and related air pollution issues in East Asia and promoting cooperation among participating countries.

### 13 participating countries of EANET:

Cambodia | China | Indonesia | Japan | Lao PDR | Malaysia

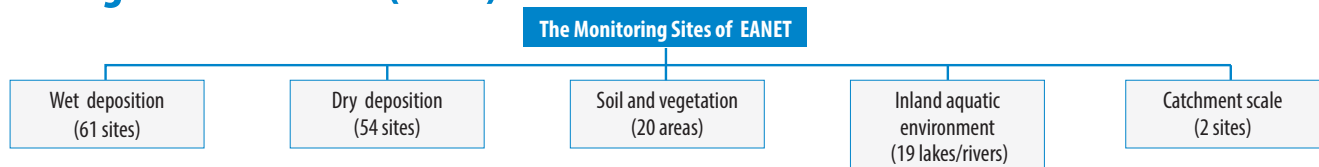
Mongolia | Myanmar | Philippines | R. of Korea | Russia

Thailand | Viet Nam

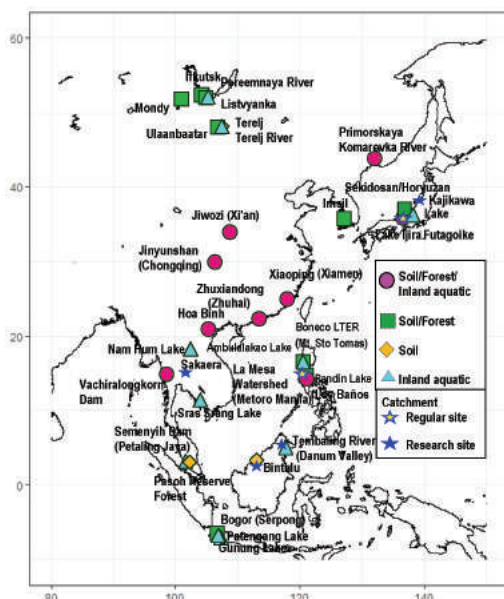
### Activities of EANET

- Major activities are monitoring and reporting, data management, technical assistance, capacity building, research and public awareness.
- The monitoring data is published annually and can be downloaded on the website.
- Using EANET data, scientific assessment reports and reports for policy makers are published periodically.

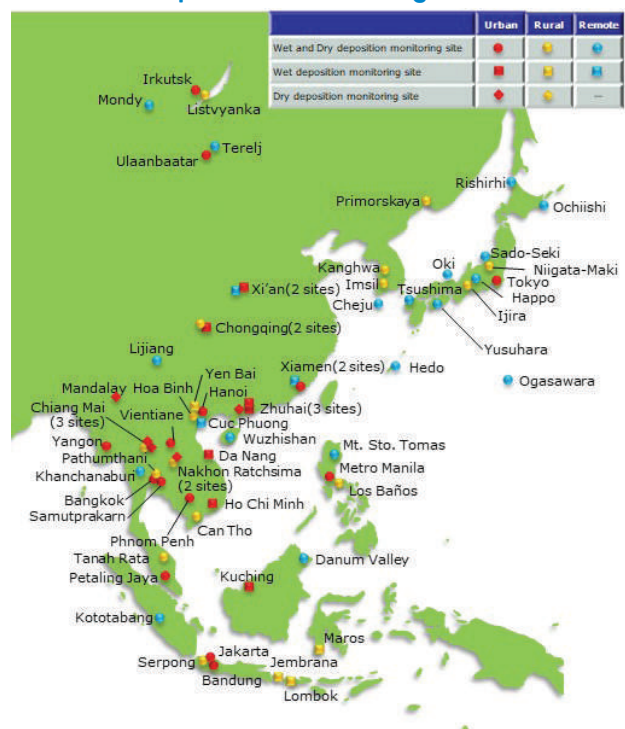
### Monitoring Sites of EANET (2019)



#### Ecological impacts monitoring sites

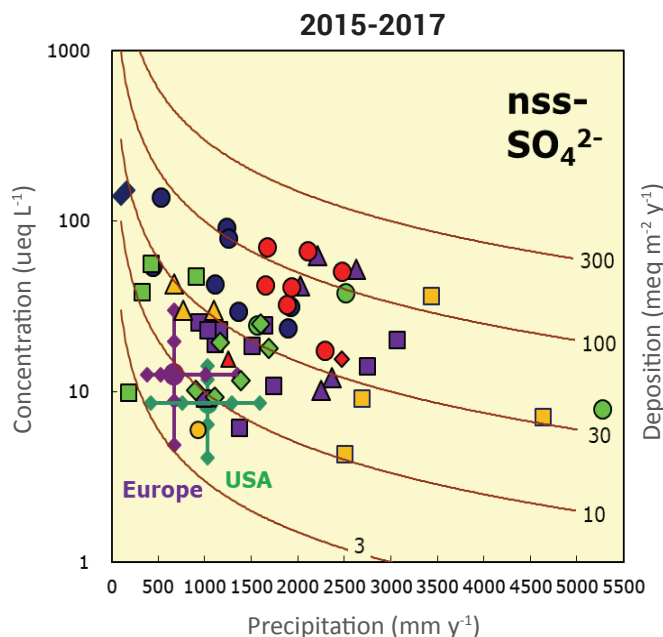


#### Deposition monitoring sites





## Monitoring Results and Trends of Wet Deposition in EANET

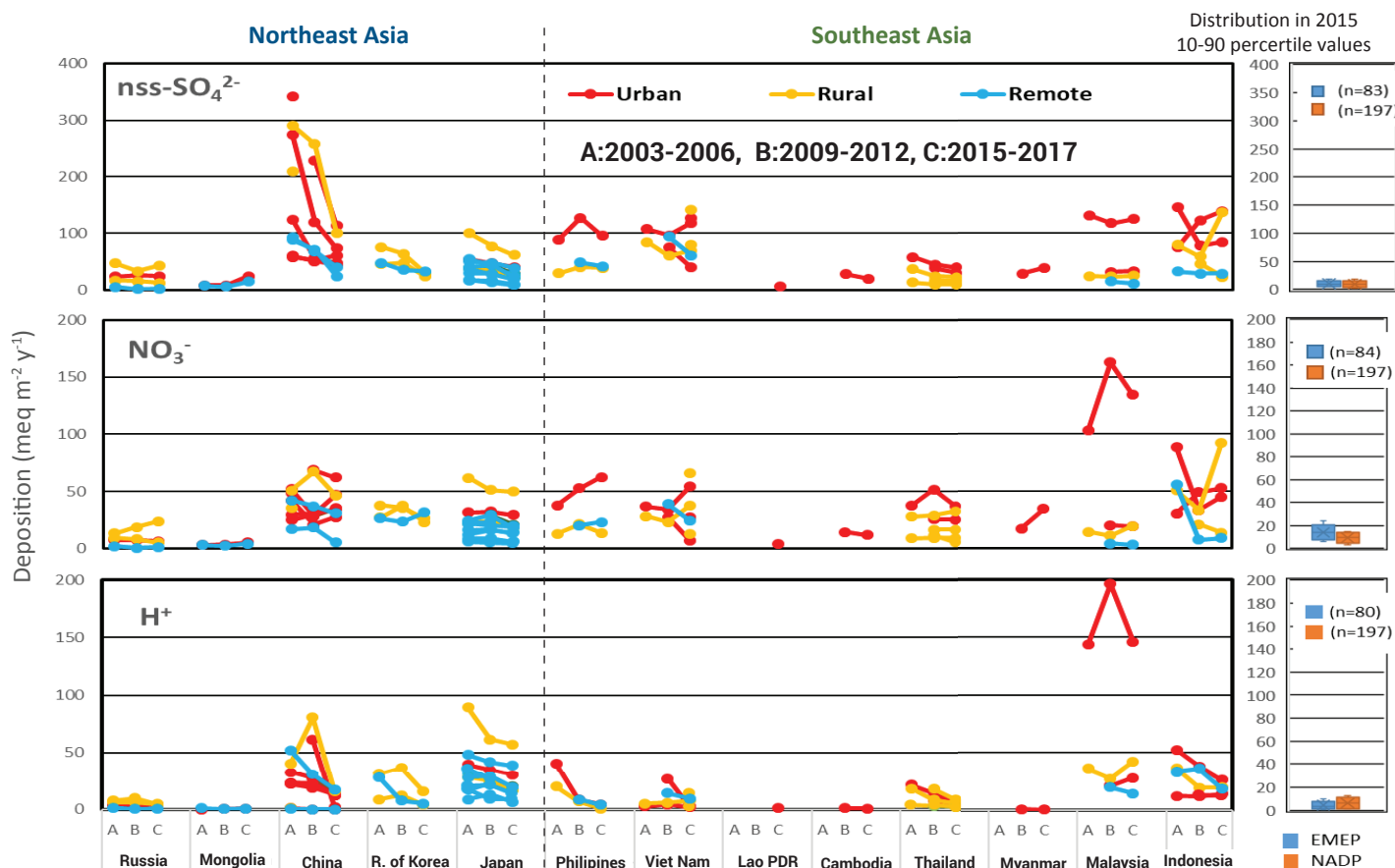


(Europe & USA) 10 to 90 percentile values of precipitation amount and concentration

(nss-SO<sub>4</sub><sup>2-</sup> and NO<sub>3</sub><sup>-</sup>) Indicators of sulfuric acid and nitric acid that acidify precipitation

(H<sup>+</sup>) Indicator of precipitation acidity

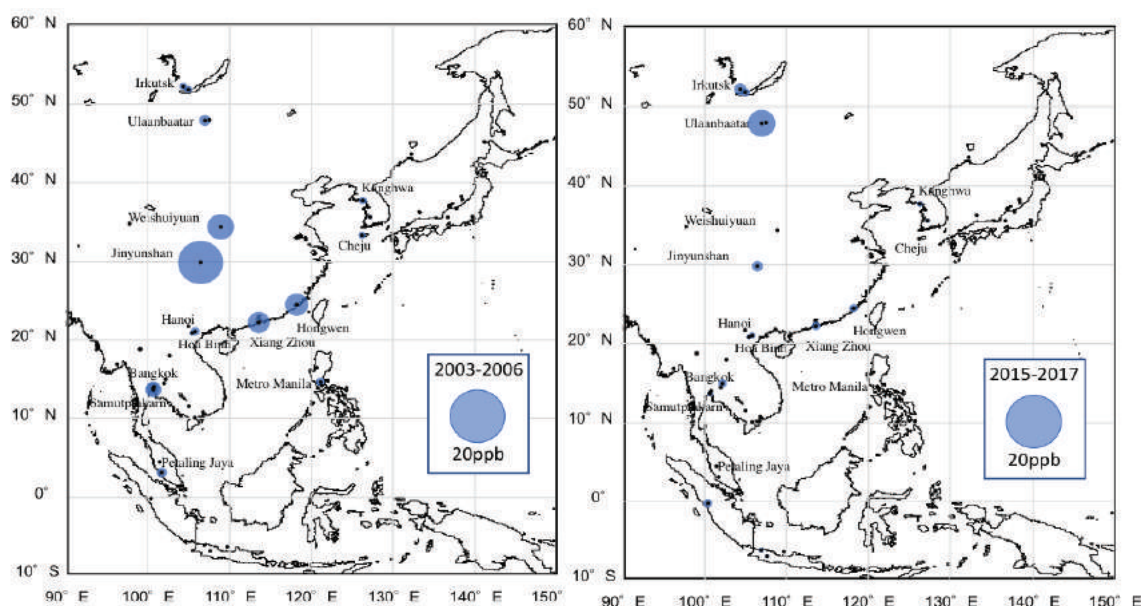
- ✓ Diversity of wet deposition of nss-SO<sub>4</sub><sup>2-</sup> in EANET region was recognized in comparison with Europe (European Monitoring and Evaluation Programme, n=97, 2015) and USA (National Atmospheric Deposition Program, n=197, 2015).
- ✓ Large deposition (>100 meq m<sup>-2</sup> y<sup>-1</sup>) was observed at some sites due to high concentration and/or large precipitation amounts.
- ✓ Some sites in Northeast Asia showed small wet deposition due to small precipitation amount.



- Decreasing trends of nss-SO<sub>4</sub><sup>2-</sup> and H<sup>+</sup> deposition were clearly observed not only at some urban sites but also at some rural and remote sites in Northeast Asian countries.
- On the other hand, large deposition of nss-SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, and H<sup>+</sup> were noticeable at some sites in Southeast Asian countries.
- As a result of long-term reduction of sulfur and nitrogen oxides, wet deposition of acidifying species in European Monitoring and Evaluation Programme (EMEP) and National Atmospheric Deposition Program (NADP, North America) was distributed in the range lower than that at many EANET sites.

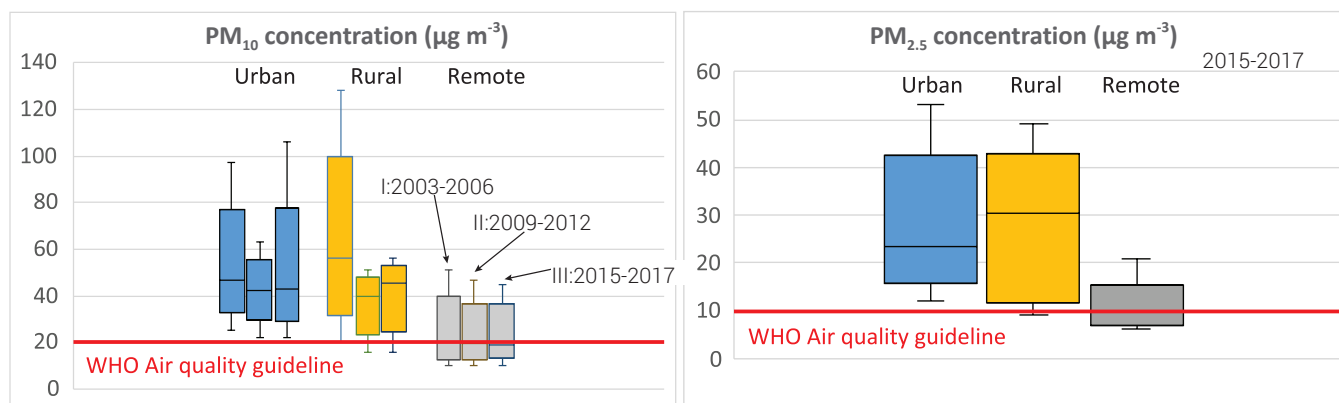
## Monitoring of Results and Trends of Dry Deposition in EANET

### Annual Trends of SO<sub>2</sub> Concentration



- The relatively high SO<sub>2</sub> concentration was observed at some sites in Northeast Asia from 2003 to 2006, but it decreased sharply according to the monitoring results during 2015-2017. Meanwhile, high SO<sub>2</sub> concentration was observed in other sites. At other monitoring sites indicated by black dots, the SO<sub>2</sub> concentration was low and no significant change was observed.

### Annual PM<sub>10</sub> and PM<sub>2.5</sub> Concentration Trends



Urban				Rural				Remote			
	I	II	III		I	II	III		I	II	III
China	2	3	2	China	2	1	1	Japan	9	9	9
Japan	1	1	1	Japan	1	1	1	R. of Korea	1	1	1
Lao PDR			1	R. of Korea	2	2	2				
Malaysia	1										
Mongolia			1								
Philippines			1								
Thailand	2	4	5								

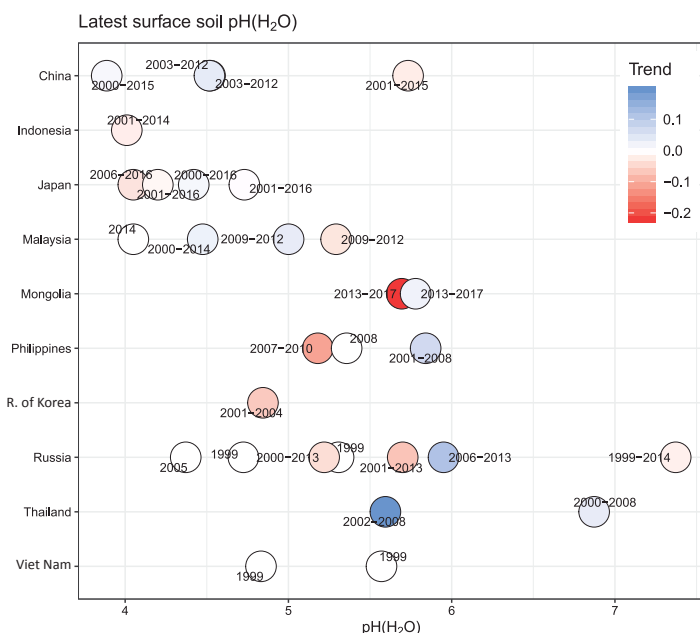
Number of sites by category

Site Number	Urban	Rural	Remote
Japan	1	1	9
Myanmar		1	
Mongolia	1		
Philippines	1		
R. of Korea		1	1
Thailand	4		1
Viet Nam		1	

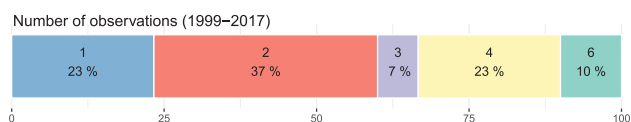
- The annual average PM<sub>10</sub> concentration in three periods at each site category (urban, rural and remote) showed fluctuated trends. Almost all sites except the 5 remote sites in Japan exceeded the WHO guideline of 20 µg/m<sup>3</sup>.
- The annual 3-year-average (2015-2017) of PM<sub>2.5</sub> concentration at all sites in urban and rural exceeded the WHO guideline of 10 µg/m<sup>3</sup>. Only 6 remote sites in Japan meet the WHO guideline.

## Monitoring Results and Trends of Soil and Inland Water in EANET

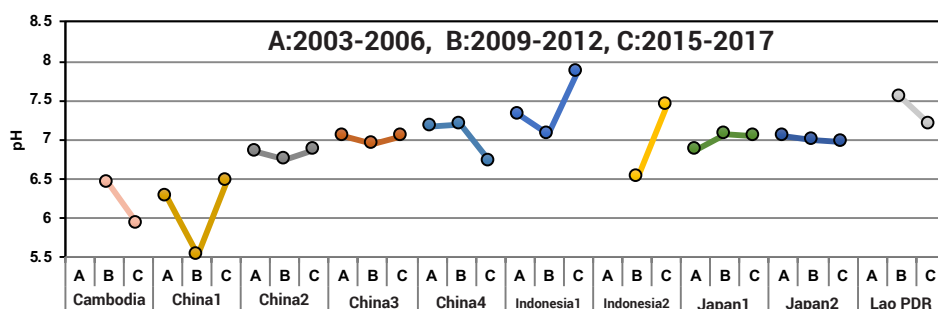
### Soil pH:



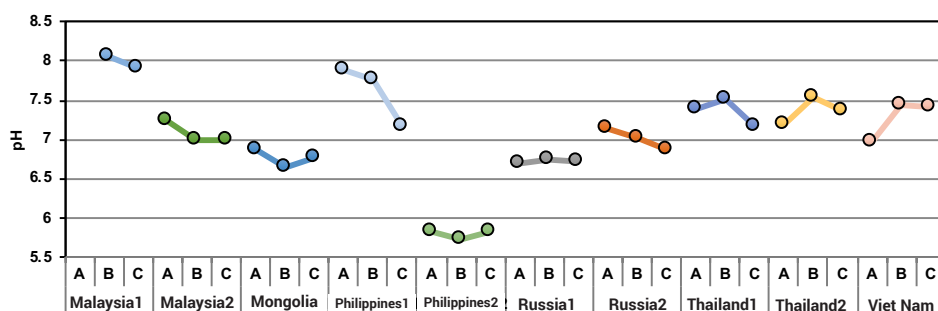
- Soil acidification was not observed on the regional scale.
- However, more than half of sites were surveyed just once or twice (see number of observations below), which is not enough to detect actual trends on soil properties.
- The color of points, which indicates annual rate of pH change, showed increasing or decreasing trends at several sites, respectively.



### Inland Water pH:



- At several sites, the pH declined in 2009 - 2012 and then increased again in 2015 - 2017, suggesting recovery from acidification. This is harmonized with the trends of wet deposition (see Page 2).



- However, the pH declined continuously throughout the periods at a few sites.

#### Secretariat

United Nations Environment  
Programme Asia and the Pacific  
2nd Floor, United Nations Building  
Rajdamnern Avenue, Bangkok, 10200,  
Thailand  
Tel: +662-288-1627  
Fax: +662-288-2829  
Email: [eanetsecretariat@un.org](mailto:eanetsecretariat@un.org)  
[www.unenvironment.org](http://www.unenvironment.org)

#### Network Center

Asia Center for Air Pollution  
Research (ACAP)  
1182 Sowa, Nishi-ku,  
Niigata-shi, 950-2144,  
Japan  
Tel: +81-25-263-0550  
Fax: +81-25-263-0566  
Email: [eanet@acap.asia](mailto:eanet@acap.asia)  
[www.acap.asia](http://www.acap.asia)

