



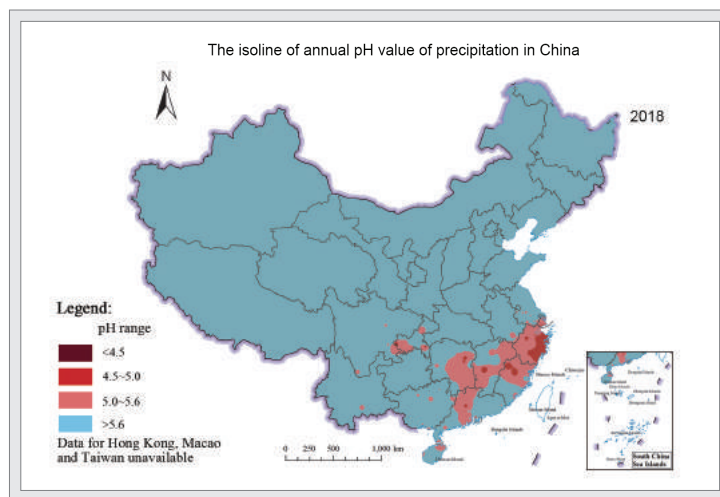
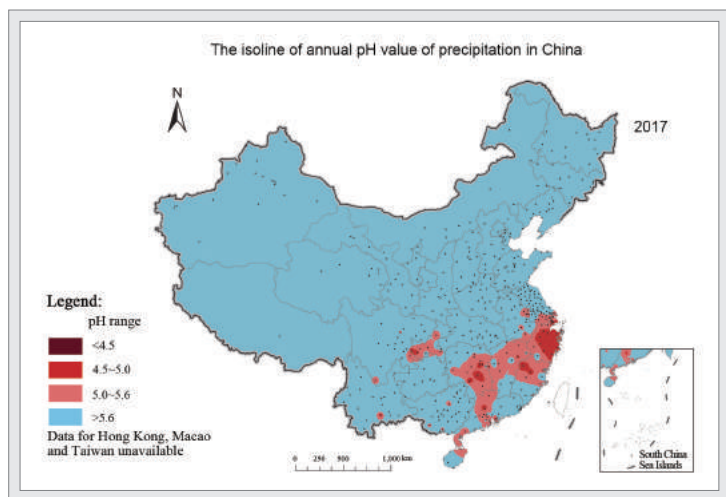
# CHINA

## Policies and Practices Concerning Acid Deposition

## 1. CURRENT SITUATION AND PROGRESS

### General Evaluation

Since 2013, China has improved its air quality while sustaining economic growth. The average concentration of PM<sub>2.5</sub> and SO<sub>2</sub> in the first 74 cities implementing National Ambient Air Quality Standard (NAAQS) dropped 42% and 68% respectively from 2013 to 2018. In 2018, 121 of China's 338 above-prefecture-level cities (35.8%) met the air quality standard. The share of days with good air quality in the 338 cities was 79.3%, 1.3 percentage points higher than that of 2017. In the total of 471 cities, districts and counties that had monitored precipitation, the average frequency of acid rain was 10.5%. In general, the type of acid rain was still mainly sulfuric acid, and it mainly occurred in the regions south to the Yangtze River and east to Yunnan-Guizhou Plateau. In 2018, the annual average pH value of precipitation across the country was 4.34 (Dazu district in Chongqing)~8.24 (Kashgar, Xinjiang) with an average value of 5.58, and the acid rain-affected area was about 530,000 km<sup>2</sup>, 5.5% of the total land area of China (0.9% lower YoY). The percentage of land area with relatively serious acid rain was 0.6%.



### Main Pollution Sources and Trends

In 2018, the main cations in precipitation were calcium and ammonium, taking up 26.6% and 15.0% respectively of total ion equivalent. The key anion was sulfate radical, taking up 19.9% of the total ion equivalent, while nitrate radical took up 9.5%. In general, the type of acid rain can still be classified as sulphuric acid. Compared with 2017, the concentration of sulfate radical and magnesium ion went down, while that of nitrate radical, chloride ion and calcium ion went up a bit and other ion equivalents kept at a stable level.



## National Ambient Air Quality Standards (NAAQS) vs. WHO Guidelines

Air Pollutants	Average Time	NAAQS		WHO Guidelines
		Grade 1	Grade 2	
PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	24-hr	50	150	50
	1-yr	40	70	20
PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	24-hr	35	75	25
	1-yr	15	35	10
SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	1-hr	150	500	-
	24-hr	50	150	20
	1-yr	20	60	-
NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	1-hr	200	200	200
	24-hr	80	80	-
	1-yr	40	40	40
O <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	1-hr	160	200	-
	8-hr	100	160	100
CO ( $\text{mg}/\text{m}^3$ )	1-hr	10	10	30
	24-hr	4	4	-

## Participation in EANET

China joined EANET in 1998 on a trial basis and established EANET monitoring stations in four cities, namely, Chongqing, Xi'an, Xiamen and Zhuhai in December 1998. Later, in October 2000, the State Council approved China's official participation in EANET. During 2001- 2010, 9 monitoring stations in 4 cities joined EANET and are monitoring the parameters of wet deposition, dry deposition, inland water, soil and vegetation. Technical capacity building activities related to EANET were also conducted. In 2018, two monitoring stations from Lijiang and Wuzhishan joined EANET and started monitoring activities in 2019.

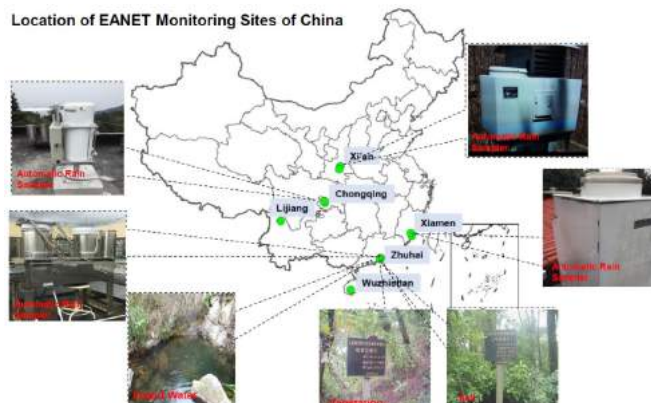
- National Focal Point: Department of International Cooperation, Ministry of Ecology and Environment of China
- Scientific Advisory Committee Members: Institute of Chinese Research Academy of Environmental Sciences and China National Environmental Monitoring Center
- National QA/QC Managers: Division of Air Quality Monitoring Department, China National Environmental Monitoring Center
- National Center: China National Environmental Monitoring Center

## 2. SITE INFORMATION

The following 11 monitoring sites from the 6 cities have been added to EANET monitoring network.

City	Monitoring Sites	Site Classification	Location		
			Latitude	Longitude	Altitude (m)
Chongqing	Haifu	Urban	29°37'N	106°30'E	317
	Jinyunshan	Rural	29°49'N	106°22'E	800
Xi'an	Shizhan	Urban	34°14'N	108°57'E	400
	Jiwozi	Remote	33°50'N	108°48'E	1800
Xiamen	Hongwen	Urban	24°28'N	118°8'E	50
	Xiaoping	Remote	24°51'N	118°2'E	686
Zhuhai	Xiangzhou	Urban	22°16'N	113°34'E	40
	Haibin-park	Urban	22°16'N	113°34'E	15
	Zhuxiandong	Urban	22°12'N	113°31'E	45
Wuzhishan	Wuzhishan	Remote	18°50'N	109°30'E	958
Lijiang	Lijiang	Remote	27°14'N	100°14'E	3410

Location of EANET Monitoring Sites of China



## Monitoring Parameters

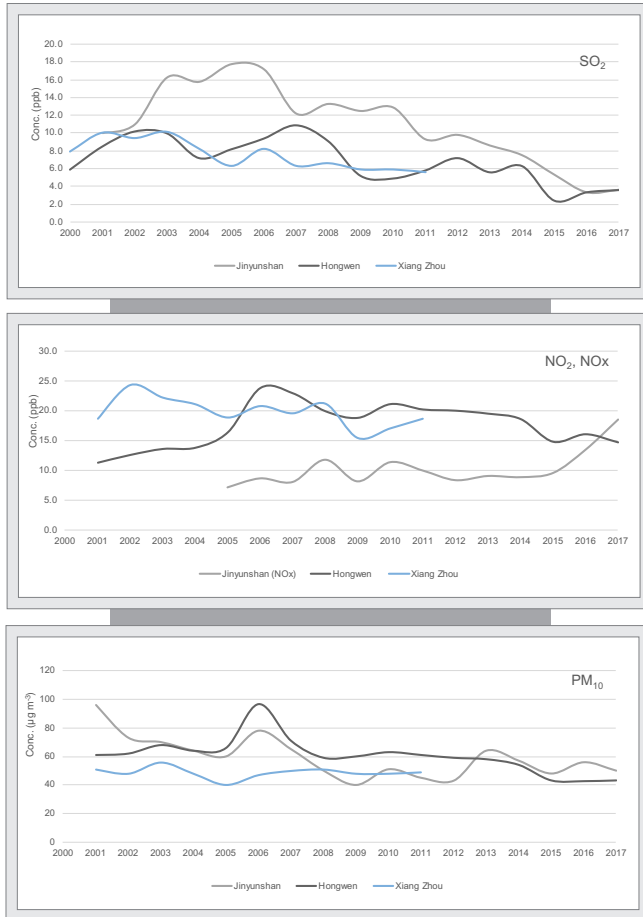
Monitoring Type	Parameters	Frequency
Wet Deposition	pH, EC, Precipitation Amount, SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , NH <sub>4</sub> <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> , Mg <sup>2+</sup> , F <sup>-</sup> (Optional)	Daily
Dry Deposition	SO <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub>	Daily
Inland Aquatic Environment	Temperature, pH, EC, SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , NH <sub>4</sub> <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> , Mg <sup>2+</sup> , Alkalinity	Quarterly
	COD, NO <sub>2</sub> <sup>-</sup> , PO <sub>4</sub> <sup>3-</sup>	Yearly
Soil and Vegetation	Observation of tree decline at the site location of Chongqing and Xiamen (in September), Xi'an (in October), and Zhuhai (in November) in each year	



### 3. HIGHLIGHTS OF MONITORING RESULTS

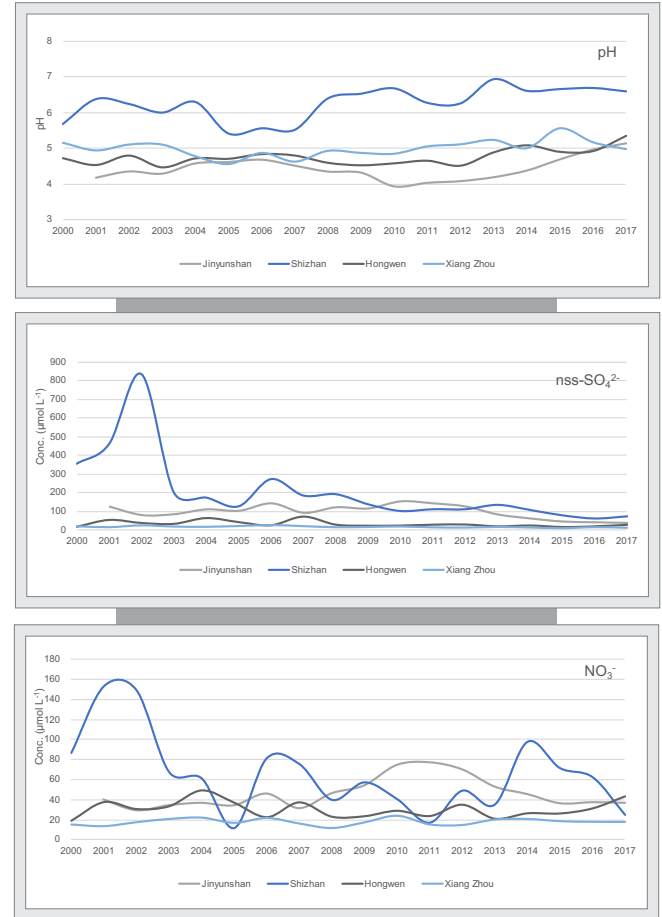
Below are the monitoring results of several stations in the areas of Dry Deposition, Wet Deposition, Inland Water, and Soil during 2000-2017.

#### Dry Deposition



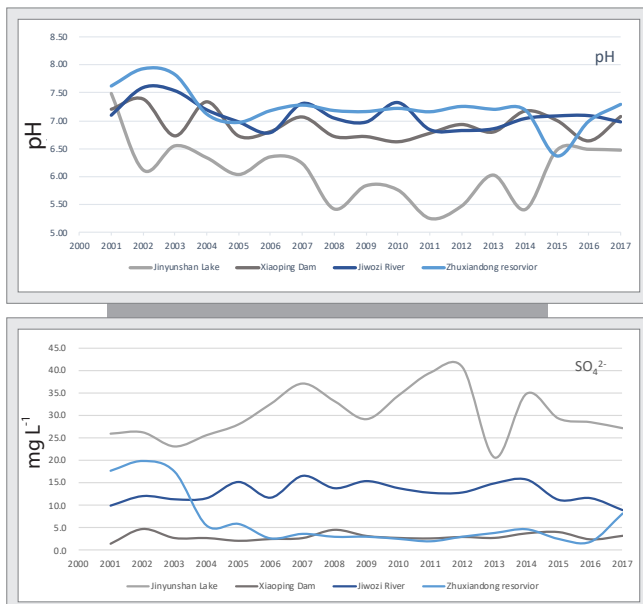
A declining trend of annual average  $\text{SO}_2$  concentrations was observed from EANET sites. An overall declining trend of  $\text{NO}_2/\text{NO}_x$  and  $\text{PM}_{10}$  concentrations was observed from Hongwen site after 2006.

#### Wet Deposition

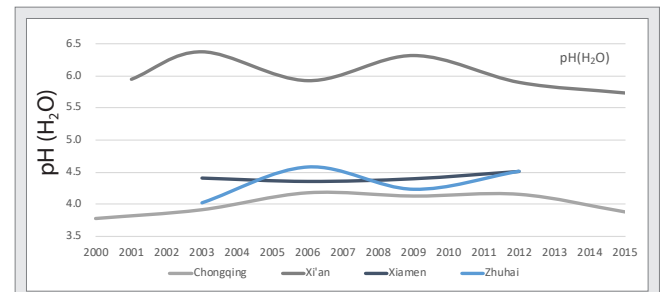


The annual average pH values from EANET sites showed an overall upward trend after 2010.  $\text{nss-SO}_4^{2-}$  and  $\text{NO}_3^-$  concentrations from Jinyunshan sites demonstrated a declining trend since 2010.

#### Inland Water



#### Soil



Soil  $\text{pH}(\text{H}_2\text{O})$  varied depending on the region according to geology of the site. A significant relationship between air deposition and soil  $\text{pH}(\text{H}_2\text{O})$  was not clear.

Inland water pH value declined with increase of  $\text{SO}_4^{2-}$  concentration until 2011/2012. Thereafter, pH started increasing with a decline of  $\text{SO}_4^{2-}$  concentration. These trends are well corresponded to the trends of wet deposition.



## 4. AWARENESS ACTIVITIES, RELEVANT POLICIES AND FUTURE PLAN

Report on environmental quality is published every year, including the information on acid deposition; dedicated websites have been established to publicize environmental protection efforts; the specialty of environmental protection has been offered in more and more universities and colleges, fostering a large number of talent for the environmental causes; more and more people including children care about environmental protection; and the green lifestyle has become more popular.

### Policies and Practices Concerning Air Pollution

- **Improving Legal Framework**

Since 2013, China has made and revised many laws and regulations on prevention and control of air pollution, including the Environmental Protection Law of the People's Republic of China, the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution, the Law of the People's Republic of China on Environmental Impact Assessment, the Environmental Protection Tax Law of the People's Republic of China, the Law of the People's Republic of China on Prevention and Control of Desertification, and the Law of the People's Republic of China on Energy Preservation. They cover various fields of air pollution control.

- **Upgrading Industrial Standards and Companies**

China has been pushing ahead with pollutant emissions control of industrial enterprises. Since 2013, a total of 15 standards for key industries such as cement and petrochemical industries were released or revised. Upgrading and renovation programs for pollution control facilities in key industries such as steel, cement and plate glasses were pushed forward.

- **Ultra-Low Emissions and Energy-Saving Transformation**

Ultra-low emissions and energy-saving transformation of coal-fired power plants were launched in 2014. By the end of 2018, coal-fired plants had completed the transformation 810 million kilowatts of ultra-low emissions, accounting for 80% of the total installed capacity of coal-fired plants, which resulted in China having the world's largest clean coal-fired power generation system.

- **Industrial Restructuring**

Enterprises are forced to transform and upgrade, speed up efforts to shut down backward production facilities, address overcapacity, and improve the industrial structure. The share of tertiary industry has grown year-on-year.

- **Optimizing Energy Structure**

In 2013, China put forward the concept of "total coal consumption control" in the Action Plan, and set targets for coal consumption controls in key areas. Between 2013 and 2018, the proportion of coal consumption in primary energy had slid from 67% to 59%, curbing the trend of rapid growth of coal consumption.

### Present Activities on EANET and Future Plan

China will continue to promote ultra-low emission renovation of coal-fired power plants and non-power industries such as iron and steel, coking; implement special emission limits of air pollutants in key regions and comprehensively strengthen the management of fugitive emissions of industrial enterprises; promote integrated investigation and rectification to "unplanned, illegal and polluting" enterprises and clusters; and strengthen VOCs control in key industries.

#### National Focal Point

Asian, African and Latin American  
Affairs Division, Department of  
International Cooperation, Ministry of  
Ecology and Environment of China  
No. 12, Dong Chang An Jie, Beijing  
100035, People's Republic of China  
Tel: +86-10-65645826  
Fax: +86-10-65645824

#### 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  
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  
www.acap.asia