

# Recent Progress of Acid Deposition Monitoring Network in East Asia (EANET)

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Akira Nitta

Acid Deposition and Oxidant Research Center (ADORC)  
( Network Center for EANET )

# Outline of EANET

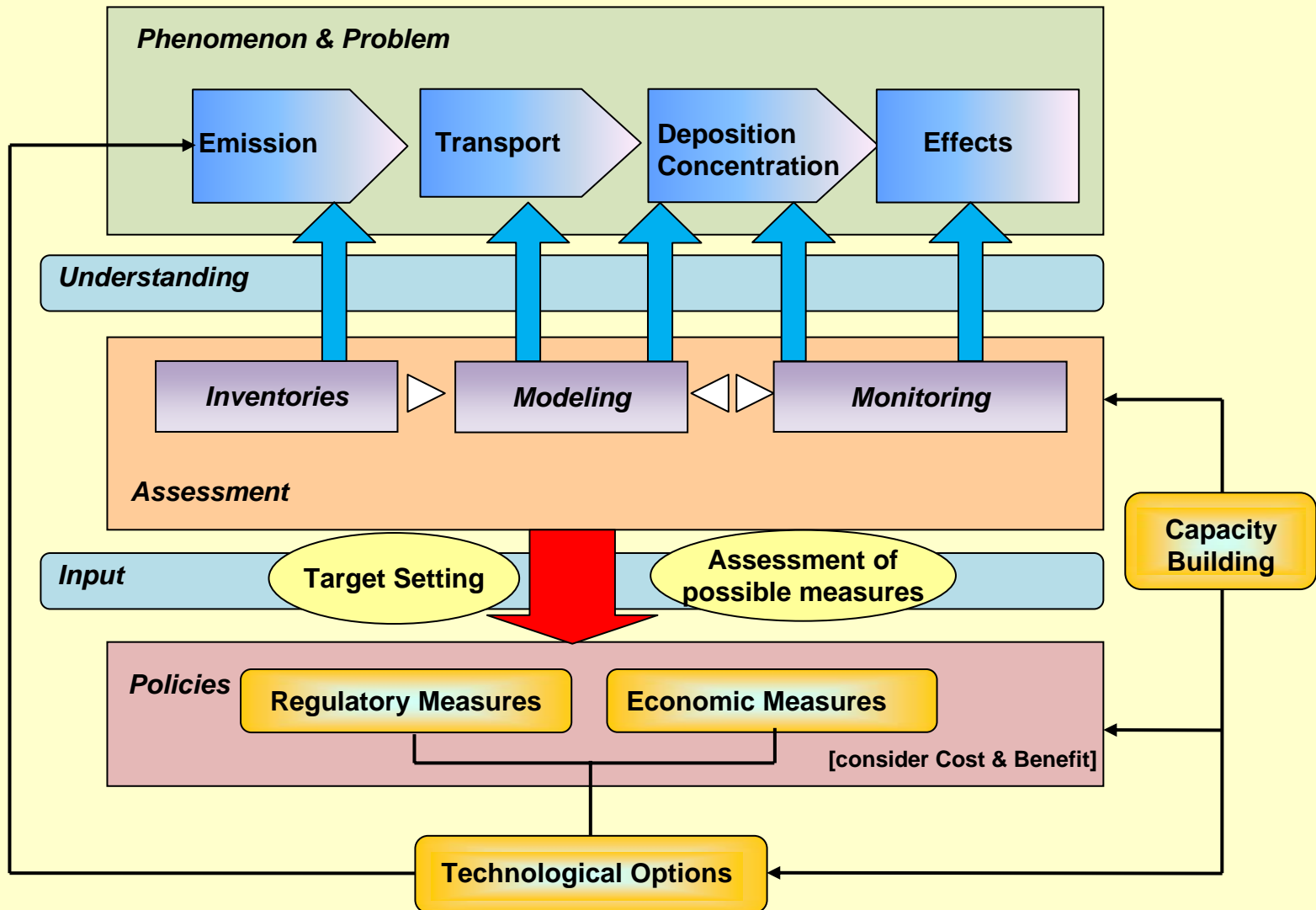
# Start of regular phase of EANET

## The Second Intergovernmental meeting (IG2), October 2000, Niigata

- Evaluated the preparatory-phase activities (1998-2000) had been successfully carried out
- Agreed to start the monitoring on a regular basis from January 2001
- Decided the Joint Announcement and Tentative Design



# Integrated approach for Air Quality Management



# Objectives of EANET (Joint Announcement)

- to create a common understanding of the state of the acid deposition problems in East Asia
- to provide useful inputs for decision-making at local, national and regional levels aimed at preventing or reducing adverse impacts on the environment caused by acid deposition
- to contribute to cooperation on the issues related to acid deposition among the participating countries

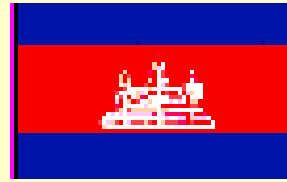
# Construction of EANET



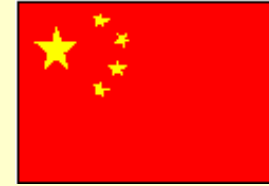
Thailand



Viet Nam



Cambodia



China



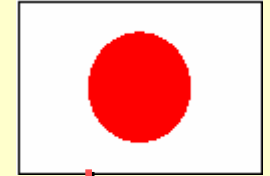
Russia



Indonesia



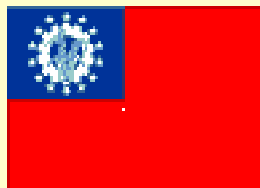
Republic of Korea



Japan



Philippines



Myanmar



Mongolia

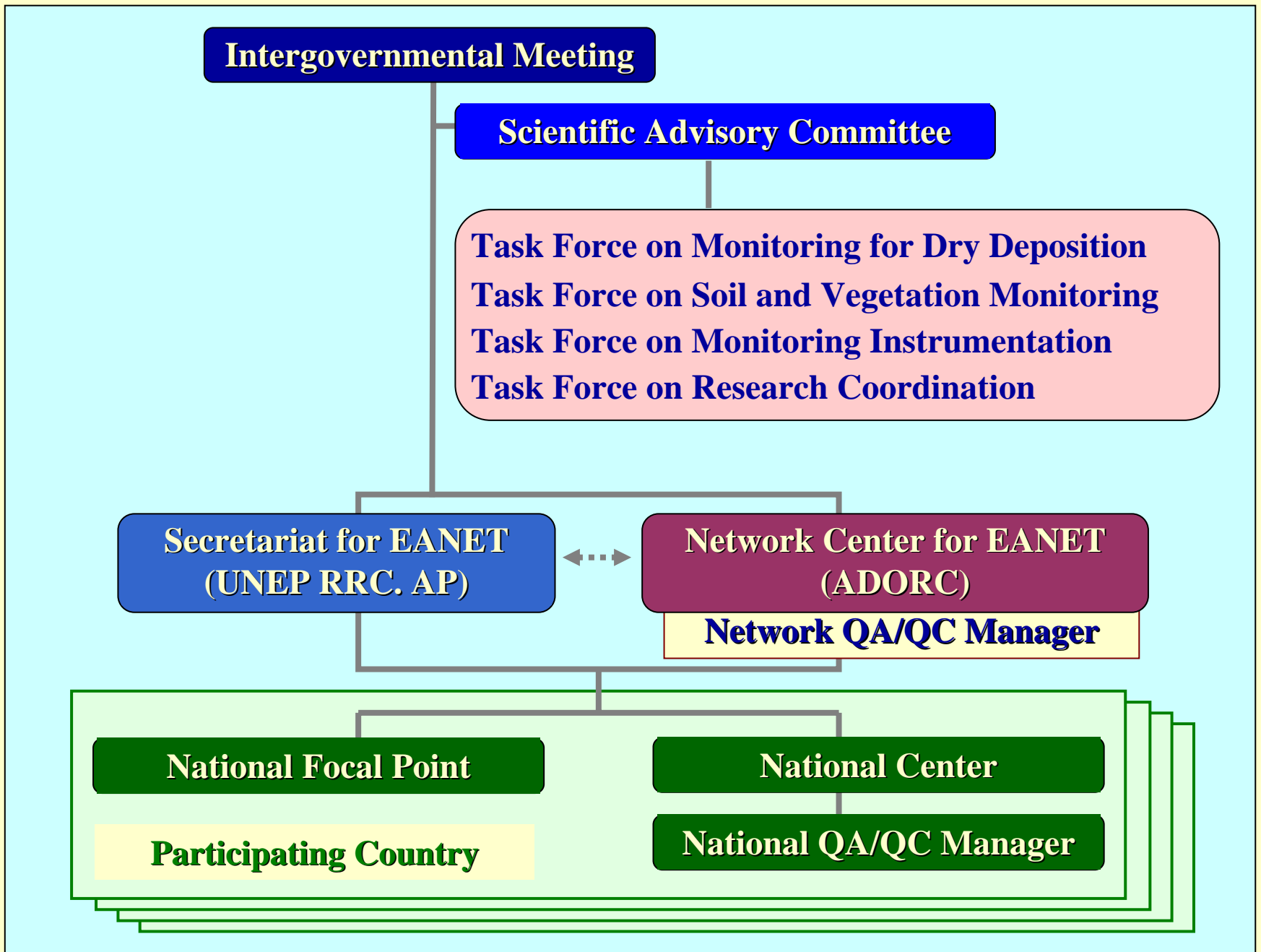


Malaysia



Lao PDR

# Framework of EANET

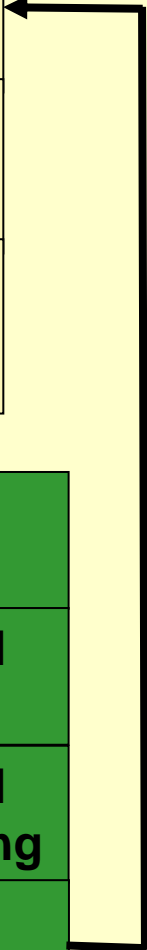




**Scientific  
Advisory  
Committee**

- Task Force on Soil and Vegetation Monitoring**
- Task Force on Monitoring for Dry Deposition**
- Task Force on Research Coordination**
- Task Force on Monitoring Instrumentation**

- Expert Group on Preparation of the second Periodic Report**
- Expert Group on Revision of Technical Manual on Wet Deposition Monitoring**
- Expert Group on Revision of Technical Manual on Inland Aquatic Env. Monitoring**
- Expert Group on Dry Deposition Flux Estimation**



# Financial Arrangement

- **National Monitoring:** Borne by each country
- **Administrative and operational cost of EANET:**  
Financed by voluntary contributions from participating countries

## EANET Budget for 2007

**Secretariat:** Around \$300,000

**NC:** Around \$1,200,000

(contribution from participating countries  
\$800,000)

# Activities of EANET

# Major activities of EANET

## 1. Monitoring

- Promotion of acid deposition monitoring
- Compilation, evaluation, storage and provision of data
- Promotion of quality assurance and quality control (QA/QC)
- Technical support and capacity building

## 2. Research

- Research activities
- Cooperation with other international activities



## 3. Others

- Public Awareness
- Report for Policy Makers



# Monitoring

**- to have and share reliable monitoring data**

# Monitoring activities

- **Wet deposition: daily/ weekly**  
pH, EC,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{Cl}^-$ ,  $\text{NH}_4^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$
- **Dry deposition (air concentration monitoring): (bi)weekly**  
(filter pack)/ hourly (automatic monitor)  
 $\text{SO}_2$ ,  $\text{NO}_2$ ,  $\text{NO}$ ,  $\text{O}_3$  and PM
- **Soil and vegetation: every 3-5 years**  
**Forest soil:** pH, exchangeable bases and acidity, ECEC  
**Forest vegetation:** General description of forest, observation of tree decline
- **Inland aquatic environment: four times a year**  
pH, EC, alkalinity, DOC / water color / sediment

Wet/Dry

Total 52/42

Russia:4/4

Mongolia:2/2

China:8/3

R. of Korea:3/3

Japan:12/12

Philippines:3/3

Viet Nam:2/2

Thailand:6/6

Cambodia:1

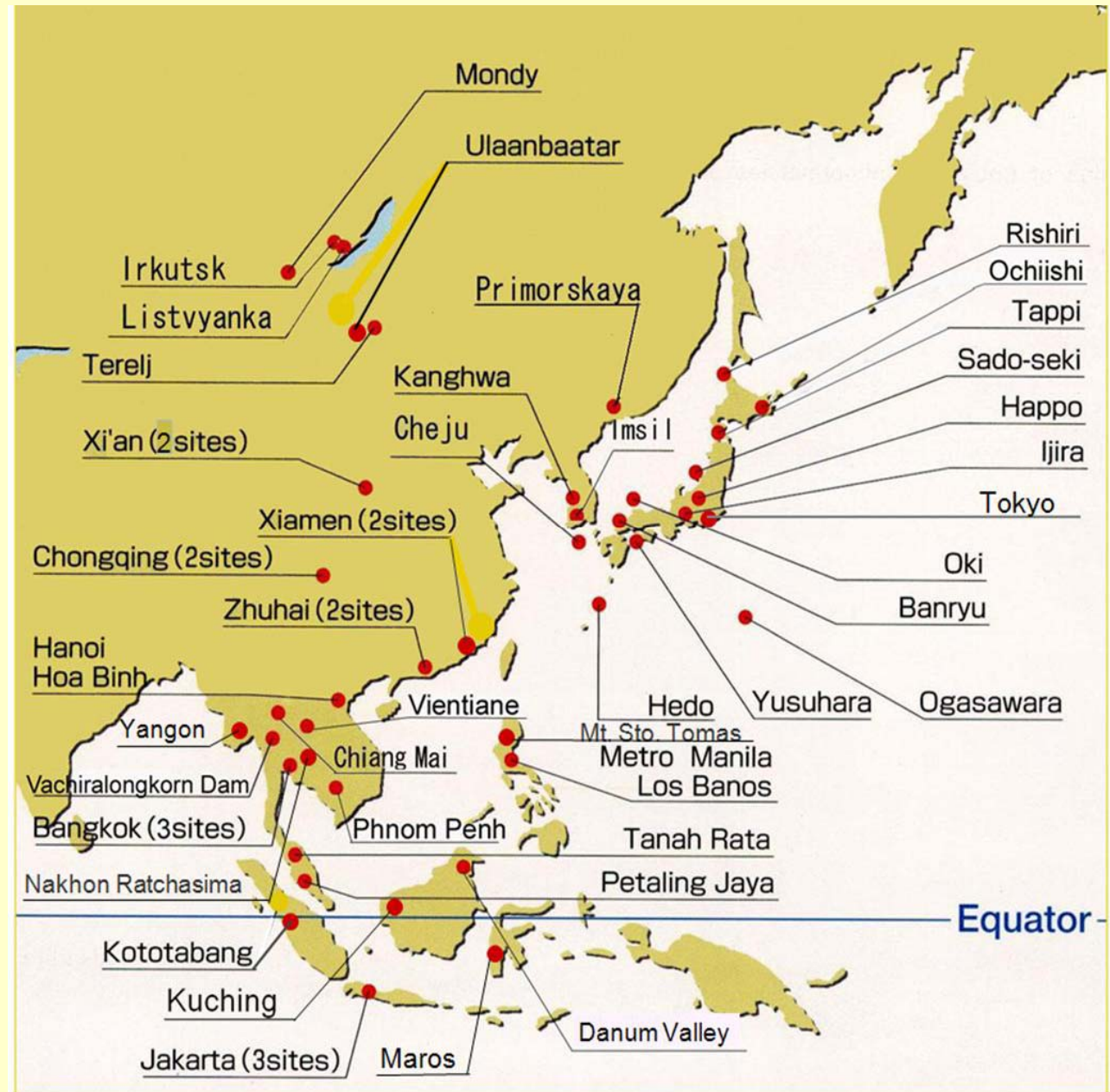
Lao PDR:1

Malaysia:4/3

Indonesia:5/4

Myanmar:1

# Acid Deposition monitoring sites in 2008



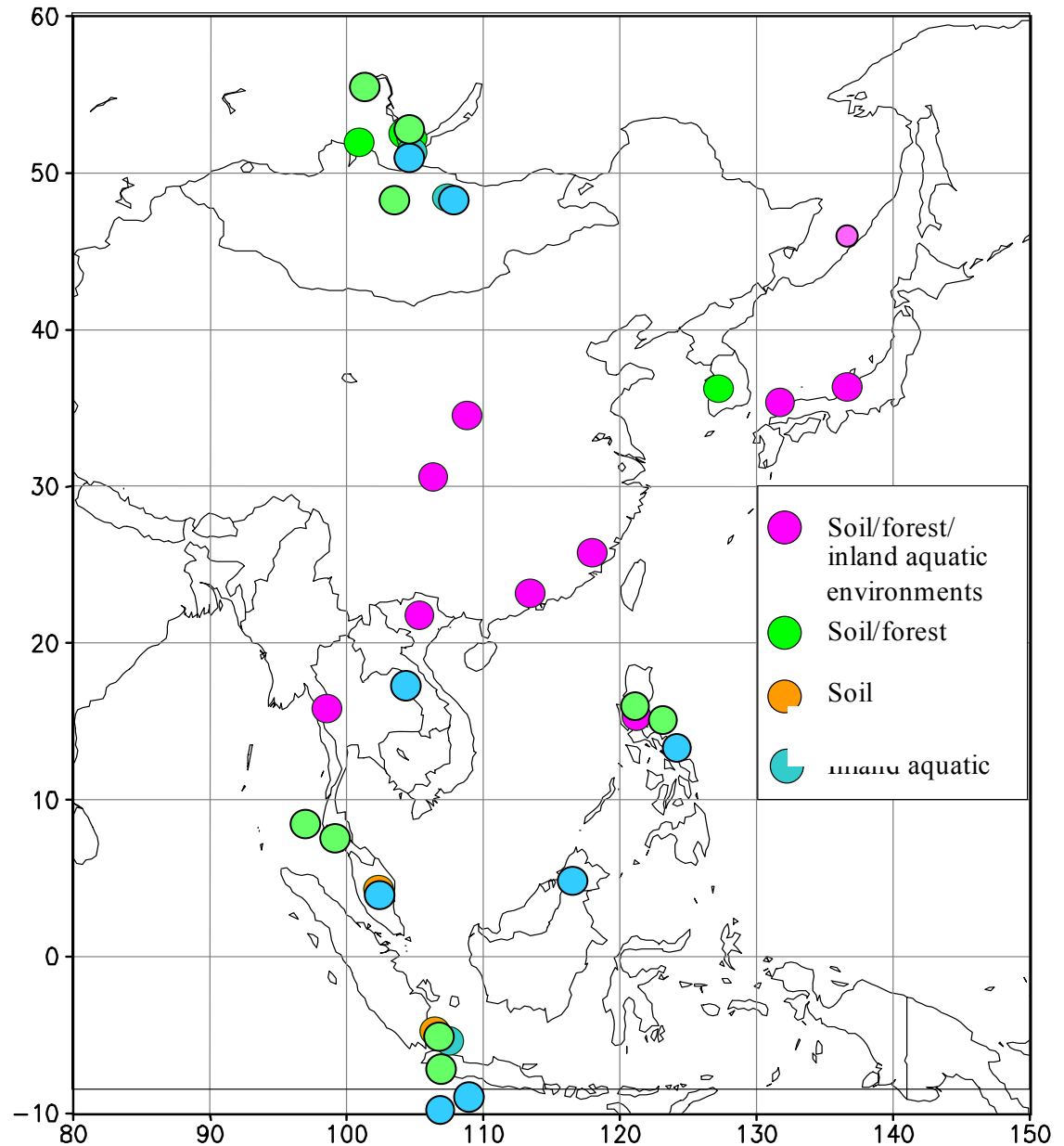
# Ecological monitoring site in 2008

## Soil & Vegetation

**21 area 29 sites**

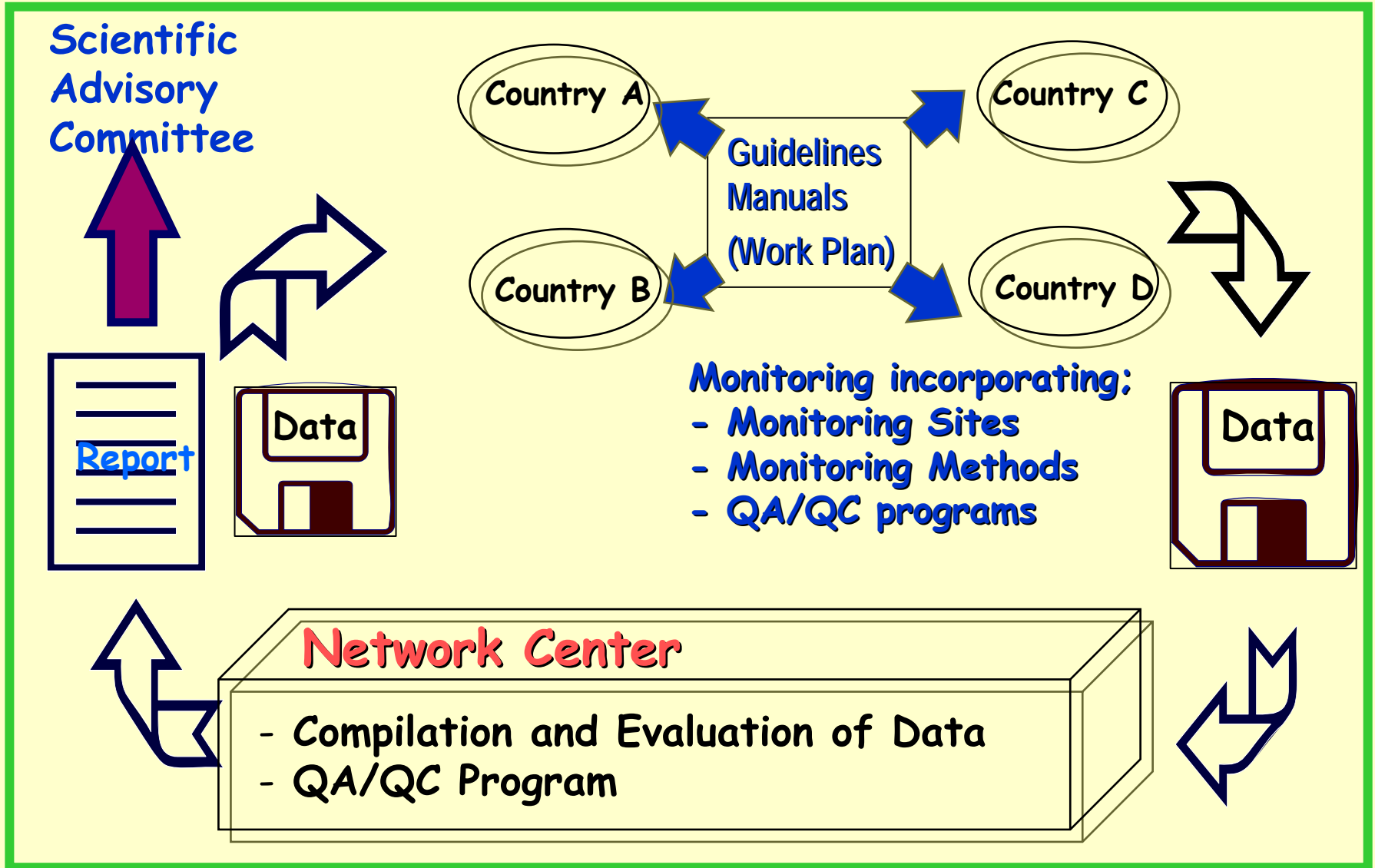
## Inland Aquatic Environment

**19 Sites**





# Data reporting procedures



# Quality Assurance and Quality Control (QA/QC)

- NC designated QA/QC manager: Mr. Shinji Nakayama, ADORC
- All participating countries designated national QA/QC managers

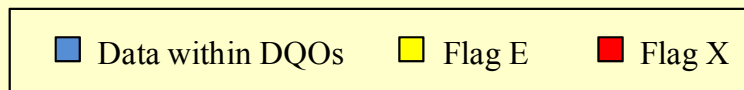
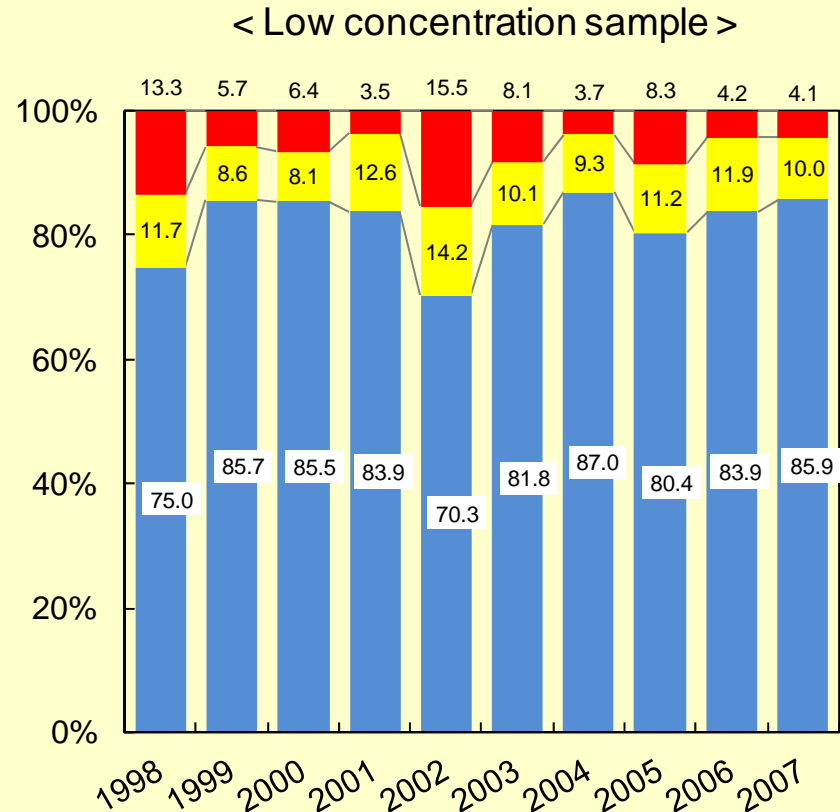
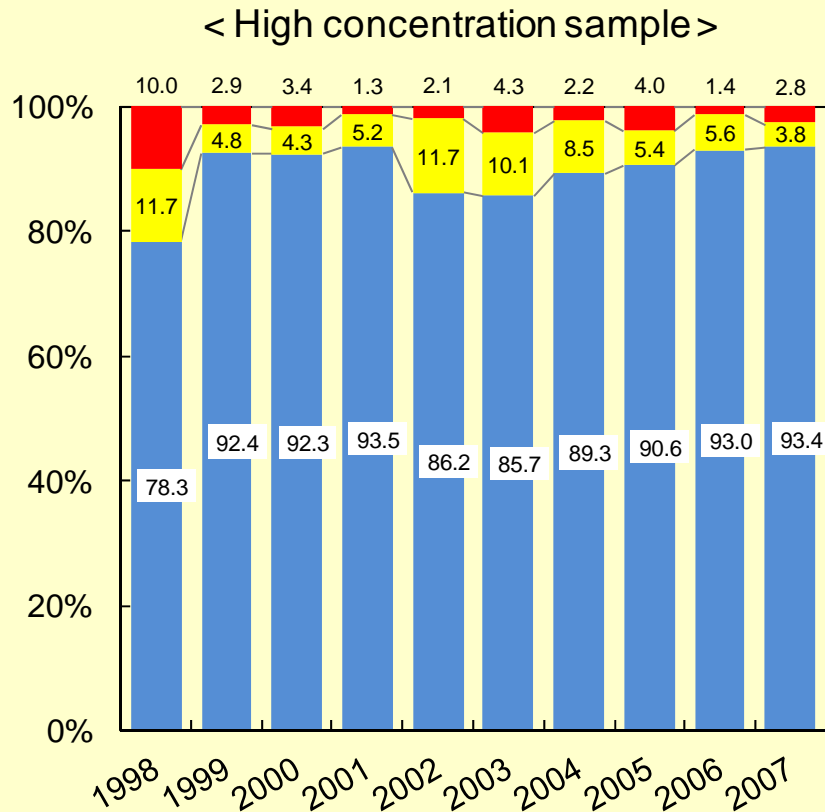
## Inter-laboratory Comparison Projects

- NC distributes samples of wet deposition, dry deposition (filter-pack method), soil and artificial surface water to the laboratories in EANET.
- The laboratories report the result of the analysis to NC.
- NC compiles and compares the data.



Reports of the projects

# Inter-laboratory Comparison Projects on Wet Deposition



# Capacity Building

## Technical Mission

- NC dispatches Technical Missions to participating countries.
- Discuss about monitoring activities and provide advices

## Individual Training Course

- NC invites trainees from participating countries

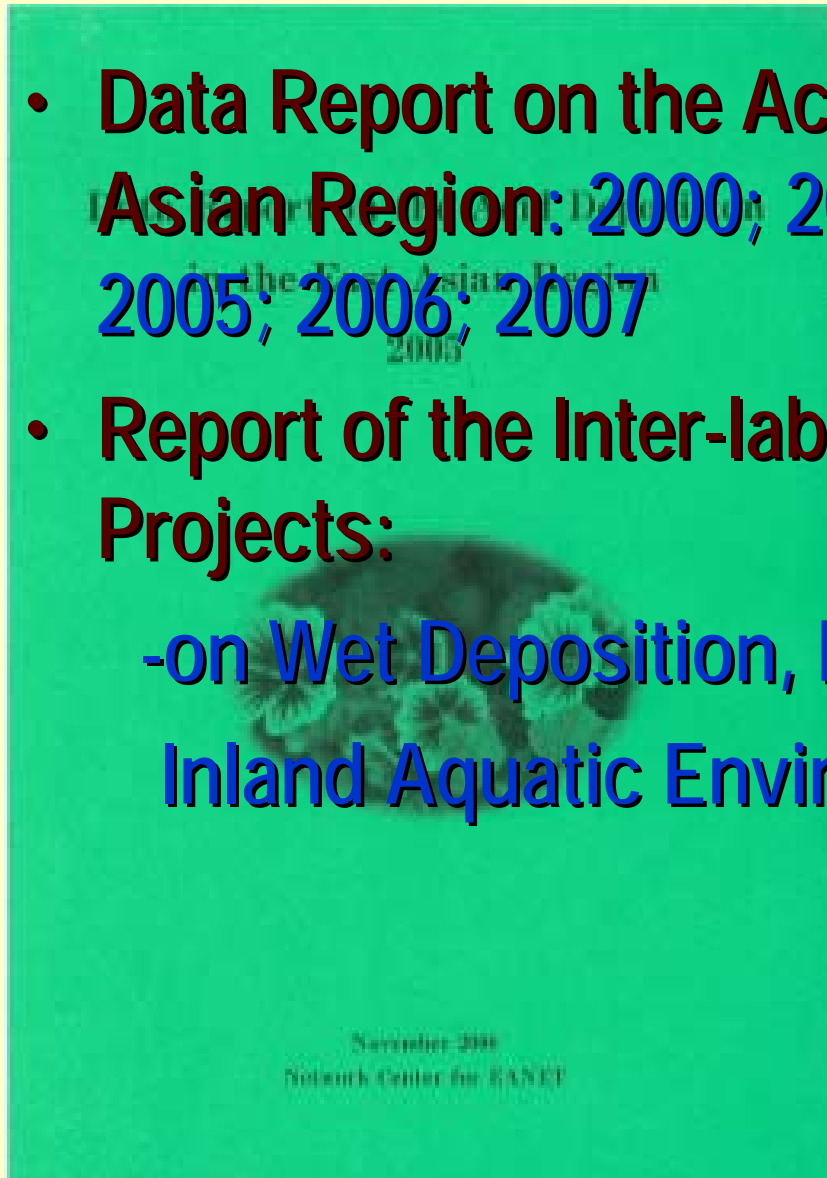


## JICA Training Course

- JICA Area Focused Training Course
- Third Country Training Course by ERTC in Thailand

# DATA report

- **Data Report on the Acid Deposition in the East Asian Region: 2000; 2001; 2002; 2003; 2004; 2005; 2006; 2007**
- **Report of the Inter-laboratory Comparison Projects:**
  - on Wet Deposition, Dry Deposition, Soil and Inland Aquatic Environment



# Research

- to improve monitoring methodologies
- to understand acid deposition problems in East Asia

# **Joint research projects with the participating countries**

- (1) Joint research project with Republic of Korea on dry deposition (aerosol concentration) monitoring methodology
- (2) Joint research project with Russia on evaluation of East Siberian atmospheric environment
- (3) Joint research project with Thailand on dry deposition (gas concentration) monitoring
- (4) Joint research project with Thailand on catchment analysis
- (5) Joint research project with Malaysia on catchment analysis
- (6) Joint research project with Japan on catchment analysis

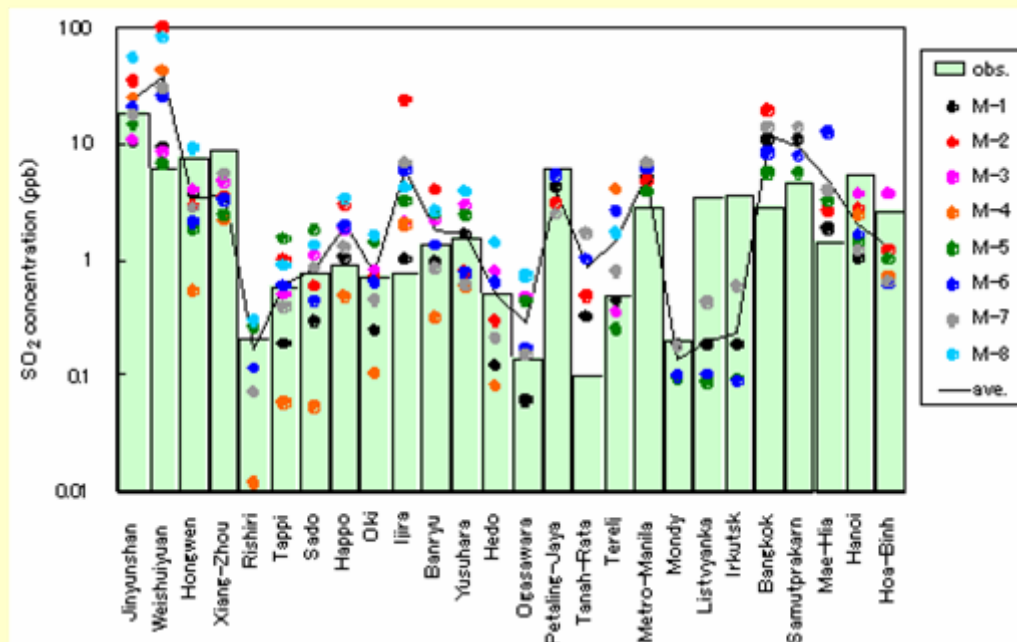
# Research projects

## (1) High Priority projects

- Analysis of existing data for improving the understanding of the status of acidification in East Asia
- Studies on suitability of various low-cost methodologies, such as passive samplers, for monitoring air concentrations
- Aerosol deposition study in forests for improvement of estimation method for dry deposition

## (2) Model Inter-comparison Study in Asia (MICS-Asia)

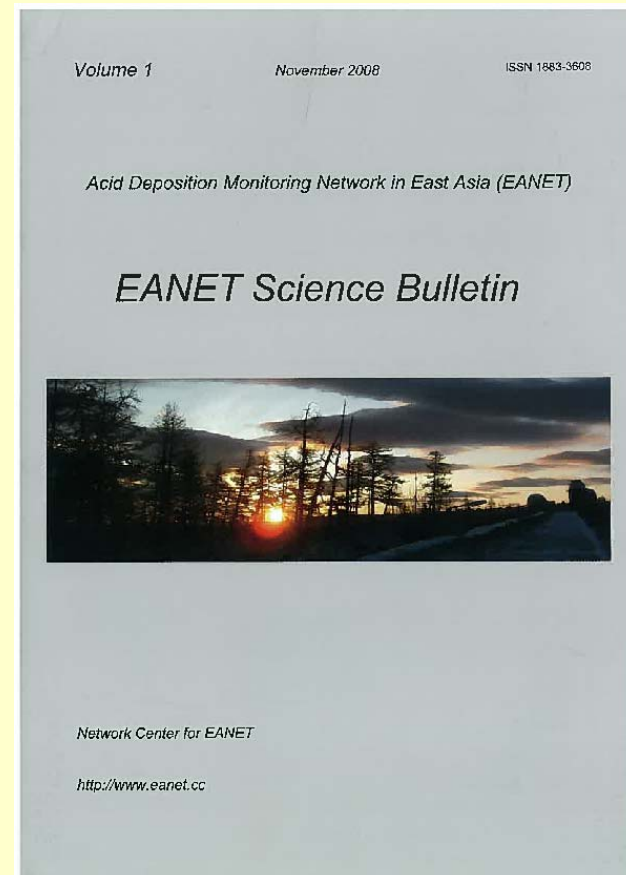
**Average SO<sub>2</sub> concentrations (modeled and observed) at EANET sites in March 2001**





# EANET Science Bulletin

- SAC reviewed and endorsed the **EANET Science Bulletin, Volume 1**
- **To share the research findings from EANET activities**
- **Provide a platform for scientists from participating countries**



# Recent Progress of EANET

**3 volumes:**

- ▶ **Executive Summary**
- ▶ **Part I: Regional Assessment**
- ▶ **Part II: National Assessments**

- **Assessment of monitoring data during 2000-2004**

# Periodic Report on the State of Acid Deposition in East Asia

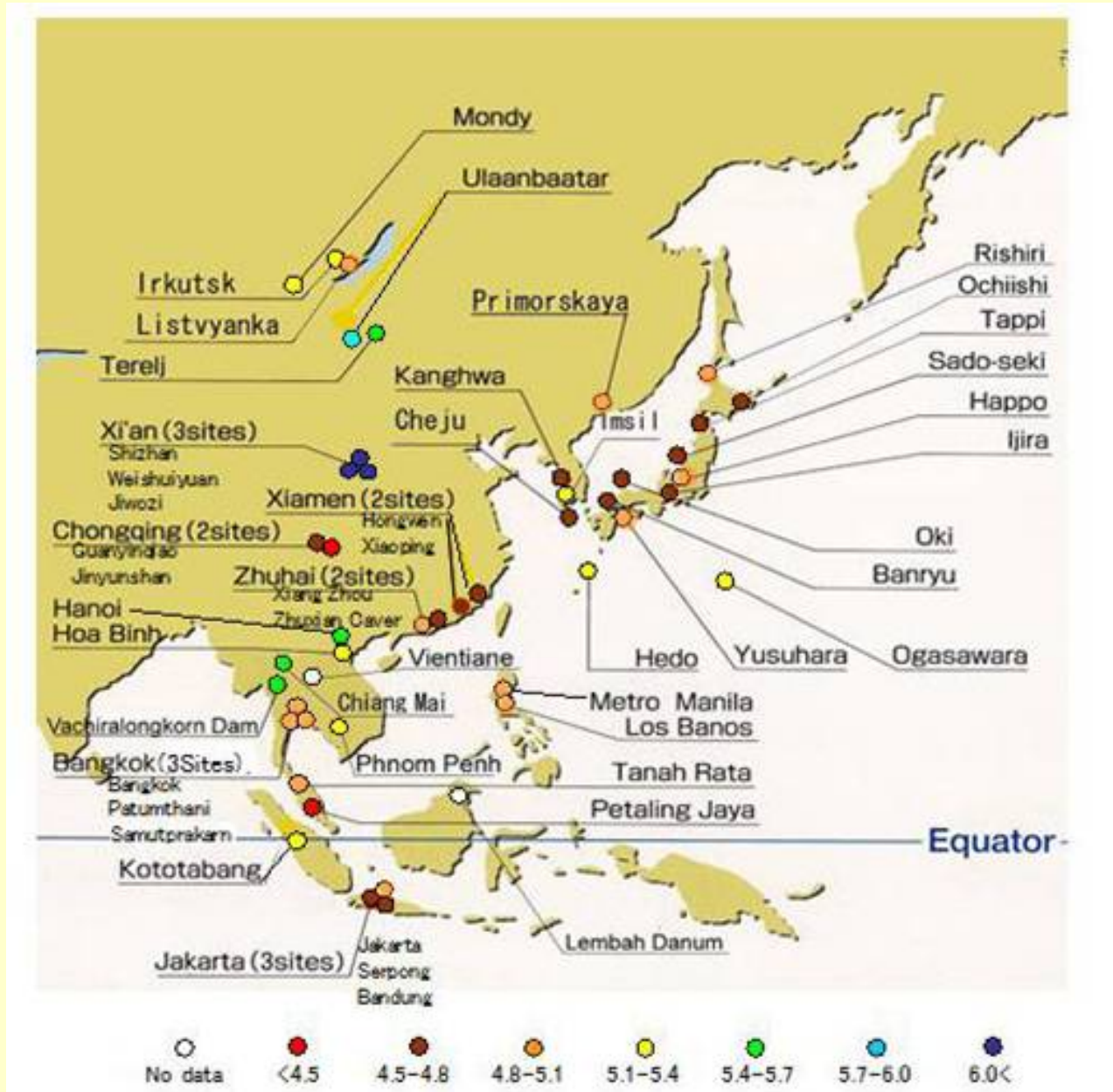


## Executive Summary

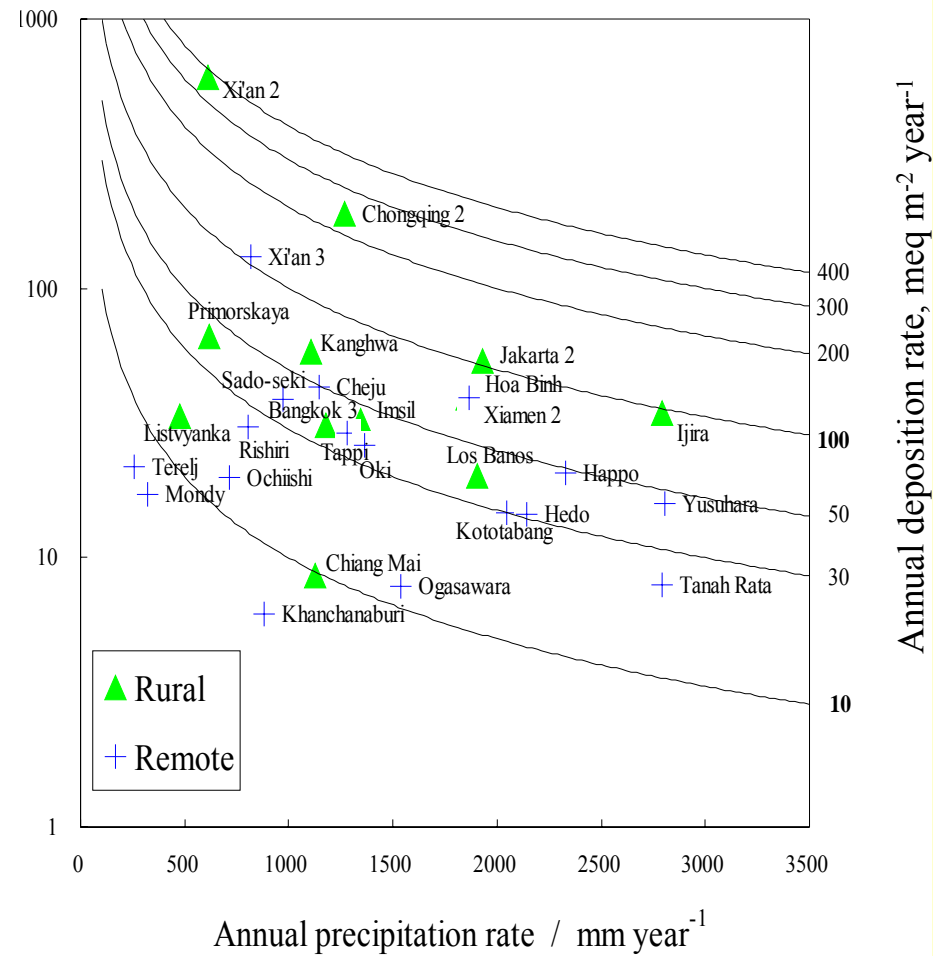
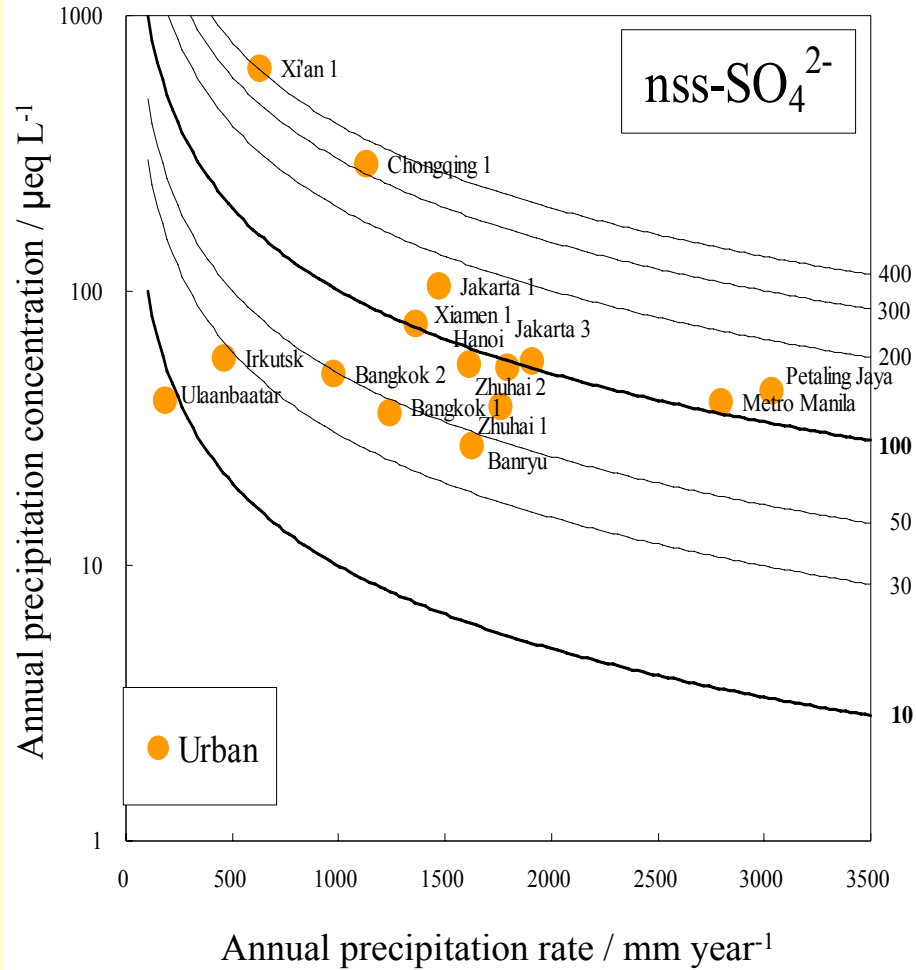


# Example of Result from EANET (PRSad)

Distribution  
of pH levels,  
2000-2004

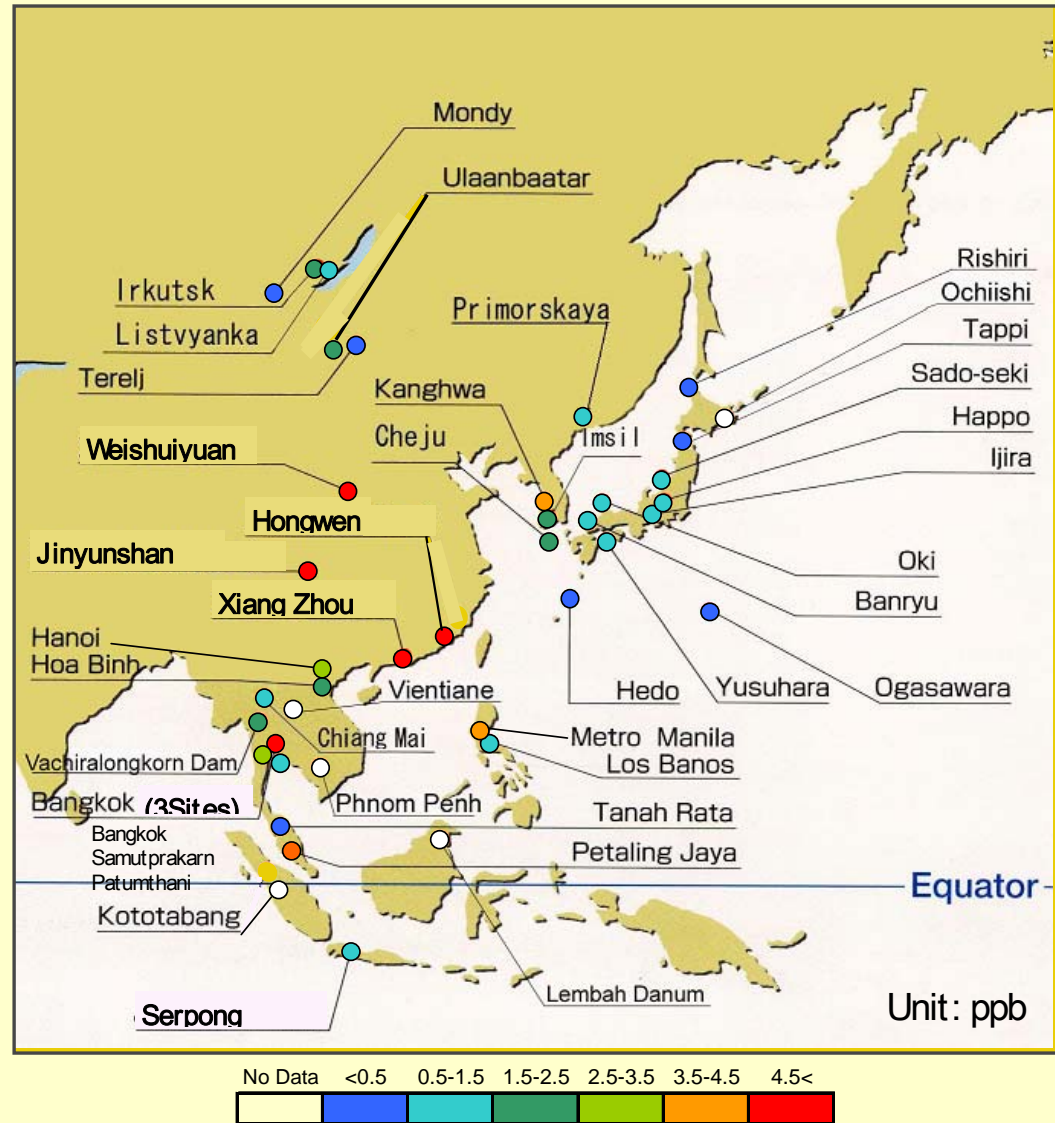


# Example of Result from EANET (PRSad)



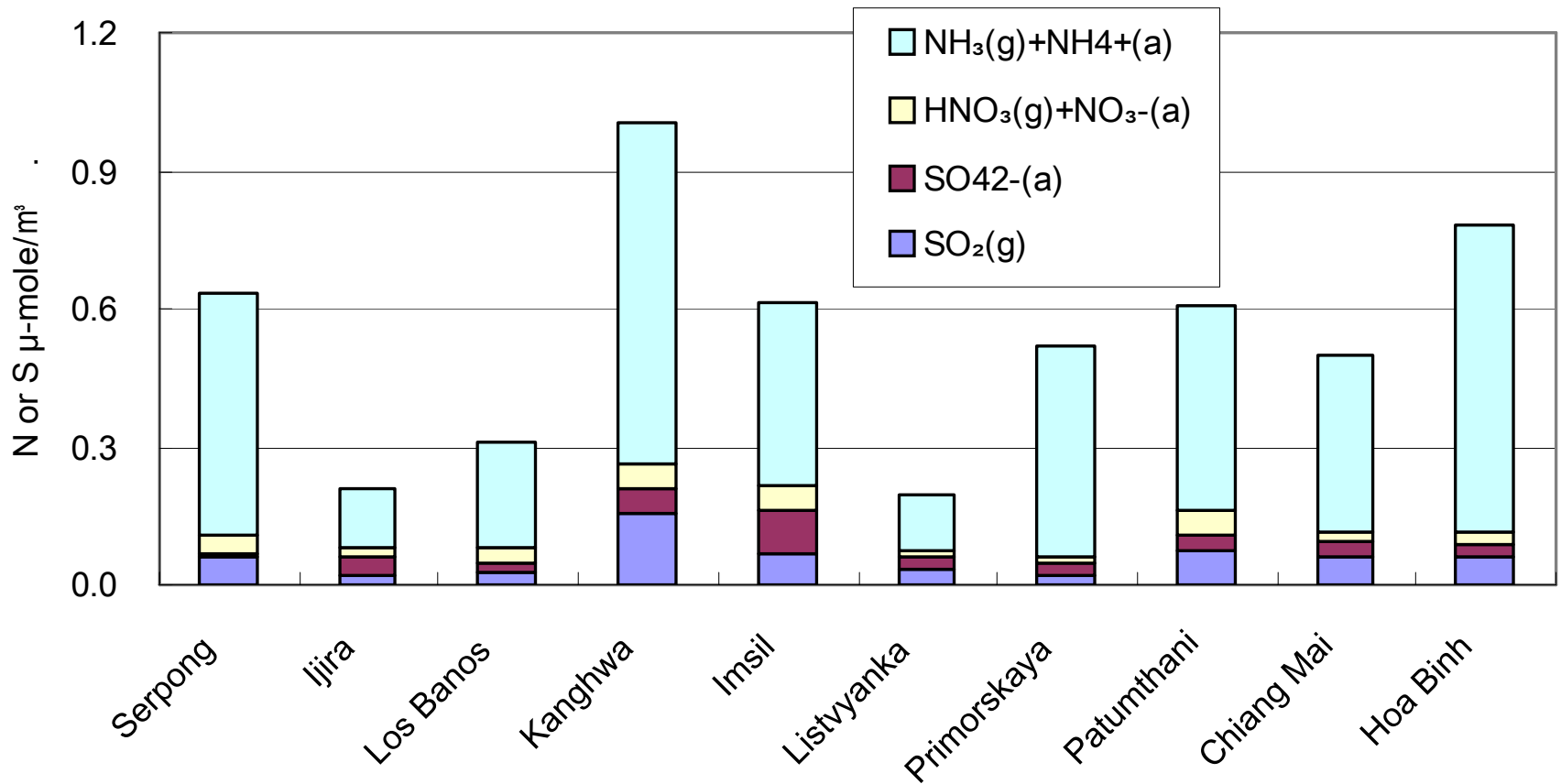
# Example of Result from EANET (PR SAD)

Levels of average SO<sub>2</sub> concentrations at EANET sites for 2000-2004



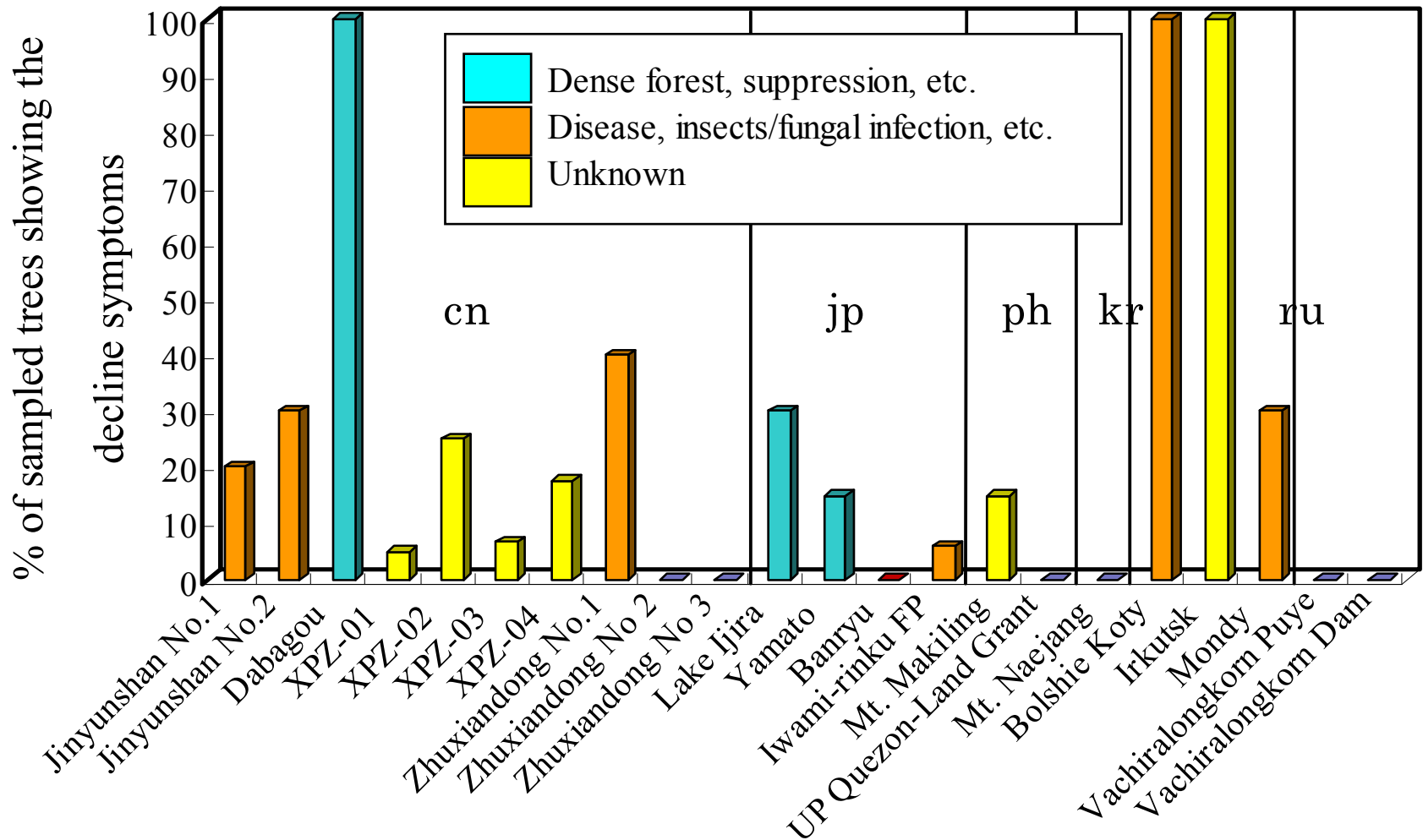


# Example of Result from EANET (PR SAD)



The average concentrations ( $\mu\text{mole}\cdot\text{m}^{-3}$ ) of major acid and base compounds of sulfur and nitrogen in the aerosol phase (a) and gas phase (g) at rural monitoring sites (2003 and 2004).

# Example of Result from EANET (PRSad)



## Present state of tree decline in the monitoring plots

Percentage of sampled trees showing decline symptoms in the respective plots are shown along with the estimated cause. Note that the trees studied were later cut down in the “Banryu” plot in Japan.



# Future activities of EANET

- **The Second Report for Policy Makers on EANET**
- **Discussion on an appropriate instrument and its legal status to provide a sound basis for financial contribution**
- **The Second Periodic Report on the State of Acid Deposition in East Asia (PRSAD)**
- **Medium Term Plan of EANET (2011-2015)**

Thank you