

# Scientific approaches and transboundary cooperation mechanism of EANET

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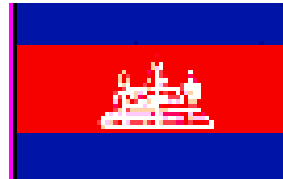
1. Participating Countries of EANET,
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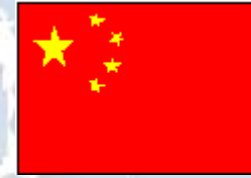
Thailand



Viet Nam



Cambodia



China



Indonesia



Russia



Rep. of Korea



Philippines



Myanmar



Mongolia

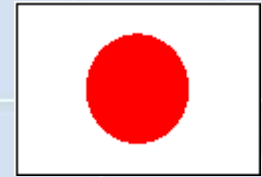


Malaysia



Lao PDR

## Countries participating in EANET



Japan

# Major activities of EANET

(Coordinated by the Network Center)

## 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



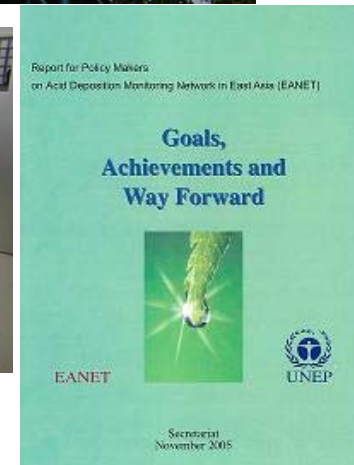
## 2. Research

- ▶ Research activities
- ▶ Fellowship researches
- ▶ Individual training
- ▶ Cooperation with other international activities



## 3. Others

- ▶ Public Awareness
- ▶ Report for Policy Makers
- ▶ Technical mission



# Monitoring Sites

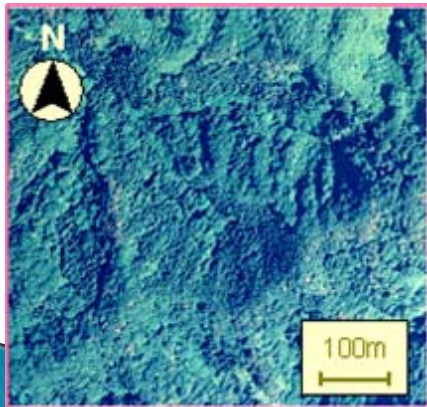
Cambodia	1	Myanmar	1
China	8	Philippines	3
Indonesia	5	Republic of Korea	3
Japan	12	Russia	4
Lao PDR	1	Thailand	6
Malaysia	4	Viet Nam	6
Mongolia	2		

Total 56 sites



# Joint Researches

- ▶ Joint research on catchment analysis with Japan, Thailand and Malaysia.
- ▶ Joint research project for developing low cost methodology on gas concentration monitoring in East Asia, China, Mongolia, ROK, and Thailand.



# Cooperative research with Russia

- ▶ MOA, The Cooperative research project on studies on transportation of air pollutants from the northern part of Eurasian Continent. (ACAP and Limnological Institute, Russian Academy of Science/Siberian branch).
- ▶ Wet and Dry deposition and river water quality to be researched.
- ▶ Sites: Irkutsk, Mondy, Listvyanka and Primorskaya.

# NEASPEC research cooperation

- ▶ TEMM (Tripartite Environment Ministers Meeting) among China, Japan, and Korea.
- ▶ TPM (Tripartite Presidents Meeting) among NIES, NIER, and CRAES.
- ▶ Tripartite Joint Research on Environmental Management in Northeast Asia, among PRCEE, IGES, and KEI.





# NEASPEC Programmes

- ▶ Mitigation of Air Pollution from Coal-fired power Plants in Northeast Asia,
- ▶ Prevention and Control of Dust and Sandstorms (DSS) from Source Areas in China and Mongolia,
- ▶ Cooperation Mechanisms for Nature Conservation in Transboundary Areas,
- ▶ Eco-efficiency Partnerships.



## Tripartite Environment Ministers Meeting (TEMM)

- ▶ The Tripartite Environment Ministers Meeting Among China, Japan, and Korea (TEMM) since 1999, TEMM 1. The TEMM 12 was held in Chitose and Tomakomai, Hokkaido Japan in June 2010.

# Tripartite Presidents Meeting (TPM)

- ▶ National Institute for Environmental Studies (NIES), Japan,
- ▶ National Institute of Environmental Research (NIER), Korea,
- ▶ Chinese Research Academy of Environmental Science (CRAES). China.
- ▶ Collaboration on “Transboundary Air Pollution” and “Dust and Sand Storms (DSS)”. TPM 7 Mongolia and India as observers (workshop on environment).
- ▶ Tripartite on Environmental Education Network (TEEN)

# Tripartite Joint Research on Environmental Management in Northeast Asia

- ▶ This joint research was conducted as TEMM's project based on the agreement made in 2005 during the 7<sup>th</sup> TEMM meeting.
- ▶ Policy Research Center for Environment and Economy of the Ministry of Environmental Protection of China (PRCEE), China,
- ▶ Institutes for Global Environmental Strategies (IGES), Japan,
- ▶ Korea Environment Institute (KEI), Korea.

# Cooperation Priority Areas 2009–2014

- ▶ Environmental Education, Environmental Awareness and Public Participation;
- ▶ Climate Change (Co-benefits Approaches, Low Carbon Society, Green Growth, etc.);
- ▶ Biodiversity Conservation;
- ▶ DSS (Dust and Sand Storms);
- ▶ Pollution Control (Air, Water, Marine Environment, etc.).
- ▶ Environment-Friendly Society/3R Sound Resource Recycle Society;
- ▶ Transboundary Movement of E-Waste;
- ▶ Sound Management of Chemicals;
- ▶ Environmental Government in Northeast Asia;
- ▶ Environmental Industries and Technology.

# Network Center activities

- ▶ EBCLRTAP meeting
- ▶ Joint Forum on Atmospheric Environment in Asia and the Pacific,
- ▶ The Better Air Quality (BAQ) workshop,
- ▶ Ministerial Regional Forum on Environment and Health in South–East and East Asian Countries,
- ▶ MICS Asia,
- ▶ Other meetings.

# Twenty-eighth Session of the Executive Body for the Convention on Long-range Transboundary Air Pollution, Geneva 13–17 December 2010

- ▶ Annually meeting with UNECE at UNOG



# Joint Forum on Atmospheric Environment in Asia and the Pacific

- ▶ The United Nations Environment Programme (UNEP) organized the meeting in Bangkok, Thailand on 10–11 March 2010.
- ▶ The representatives of these organizations attended:–
  - The EANET
  - The Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia
  - The Association of Southeast Asian Nations (ASEAN) Secretariat
  - The Central Asian Environment Convention Secretariat
  - The Secretariat of Pacific Regional Environment Programme (SPREP)
  - The South Asia Cooperative Environment Programme (SACEP) Secretariat
  - The Clean Air Initiative Asia (CAI-Asia)
  - The Institute for Global Environmental Strategies (IGES)
  - The Stockholm Environment Institute (SEI).



# The Better Air Quality (BAQ) workshop

- ▶ CAI-Asia (Clean Air Initiative for Asian Cities)
- ▶ The Better Air Quality (BAQ) workshop,  
on 9–11 November 2010 in Singapore.

# Ministerial Regional Forum on Environment and Health in South-East and East Asian Countries

- ▶ The 2<sup>nd</sup> Ministerial Regional Forum on Environment and Health in South-East and East Asian Countries held on 14–15 July 2010 in Jeju, Republic of Korea. (1<sup>st</sup> in Bangkok, 2007, 3<sup>rd</sup> will be in Kuala Lumpur in 2013).



# MICS Asia

## (Model Inter-Comparison Study (MICS))

- ▶ To have a common understanding of model performance and uncertainties in Asia,
- ▶ A model inter-comparison study on long-range transport and deposition of sulfur, called MICS-Asia Phase I, was carried out during the period from 1998 to 2000.
- ▶ Eight models participated in the Phase-I study.

# MICS Asia– Phase 2

- ▶ Further model inter–comparison study (MICS–Asia Phase II) tried to improve the understanding of the long–range transport of air pollutants in Asia.
- ▶ Ozone, aerosols, deposition and relationship with global model were prepared.
- ▶ Many workshops took place.

# MICS Asia– Phase 3

- ▶ Modeling and Emission Inventories: Multi-scale models (Global, Regional, Meso, and Urban)
- ▶ Phase III activities:
  - (1) Connection to HTAP,
  - (2) Boundary conditions of Asian region using HTAP experiment,
  - (3) Source–Receptor relationship analysis in Asia (Urban–Regional),
  - (4) Ensemble predictions and common framework for inter-comparisons,
  - (5) Studies related to climate,
  - (6) Studies related to emission scenarios.

# Model International Workshop on Atmospheric Modeling Research in East Asia

- ▶ International Workshop on Atmospheric Modeling Research in East Asia was held on 18–19 March 2010 in Dalian, China.
- ▶ Based on the outcomes at the Model Inter-Comparison Study (MICS) workshops.
- ▶ Research activities of MICS Asia Phase III, etc.

# MICS Asia– Phase 4

- ▶ Integrated numerical models for assessment and policy analysis

# Others

- ▶ Joined the 26<sup>th</sup> Task Force Meeting of International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests), UNECE, which was held from 29 May to 1 June 2010.
- ▶ Joined the 11<sup>th</sup> Annual Collaborative Action Network (CAN) Meeting.
- ▶ Co-benefit meeting.



# Cooperation with data exchanges, International/Regional Programmes

- ▶ Scientific cooperation with CLRTAP EMEP, WMO were strengthened in the past years.
- ▶ New partnerships were explored, such as UNEP–WHO Regional Forum on Environment and Health.
- ▶ Collaborative activities conducted with IIASA in the Model Inter–Comparison Study in Asia (MICS–Asia) project.
- ▶ A joint Workshop with TF HTAP was held back to back with SAC9 in 2009.

# Close links between EANET and CLRTAP

## Existing Cooperation

- ▶ Participation in TF HTAP and LRTAP Convention meetings.
- ▶ Participation in EANET meetings by CLRTAP members.
- ▶ Cooperation with ICPs under WGE:
  - participation in meetings,
  - review of the Sub-Manual on Forest Vegetation Monitoring in EANET by experts of ICP Forests,
  - participation in inter-laboratory comparison projects.

## Possible Future Cooperation

- ▶ Participation in preparation of Assessment Report on hemispheric transport by TF HTAP.
- ▶ Exchange of air pollution monitoring data.
- ▶ Participation in cooperative modeling and assessment activities.
- ▶ Participation in monitoring activities in Central Asia.

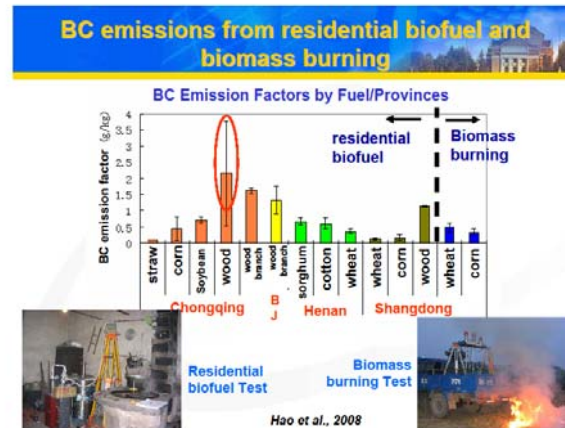
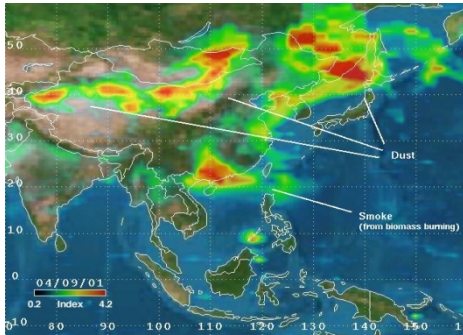
# Development of an appropriate Instrument for Strengthening the EANET

- ▶ The Twelfth Session of the Intergovernmental meeting on EANET adopted the Decision 1 /IG12 on Instrument for the Strengthening the Acid Deposition Monitoring Network in East Asia (EANET).
- ▶ Signing in the High Level Segment during IG12 and thereafter. (7/13 members, Cam, Jp, Mon, My, Ph, ROK, Th)
- ▶ Instrument will become operational on the date on which all participating countries have signed it, or on 1<sup>st</sup> January 2012.



# Instrument for Strengthening the EANET

- ▶ There are 17 Items.
- ▶ Item 1 is a Definition. Acid deposition means deposition of major acidifying species and related chemical substances.



# Objectives and scope of the Instrument (Item 2)

- ▶ To create a common understanding of the state of 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; and
- ▶ To contribute to cooperation on the issues related to acid deposition among the Participating Countries.

# 10<sup>th</sup> Anniversary of EANET

- ▶ EANET held its 10<sup>th</sup> Anniversary Ceremony at the evening of 23 November, 2010.
- ▶ Mr. Young-Woo Park, the Regional Director and Representative, United Nations Environment Programme, Regional Office for Asia and the Pacific (UNEP ROAP) delivered the opening remarks.
- ▶ Mr. Achim Steiner, the Executive Director of UNEP, also delivered the video message congratulating the celebration of the 10<sup>th</sup> Anniversary of EANET.



# Medium Term Plan for EANET (MTP) (2011–2015)

- ▶ IG12 adopted the MTP 2011–2015 which shall continue to focus on enhancement of the monitoring network, supported by the participating countries, through the implementation of strategic activities to improve geographical coverage, ensure site representativeness, and strengthen monitoring procedures, particularly sampling and analysis, to achieve more comprehensive and precise data.

# Some research results of EANET

- ▶  $\text{HNO}_3$ ,  $\text{NO}_2$ ,  $\text{NO}_3^-$ ,  $\text{NO}_x$ ,  $\text{NH}_4^-$
- ▶  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$
- ▶  $\text{O}_3$
- ▶  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$
- ▶ pH

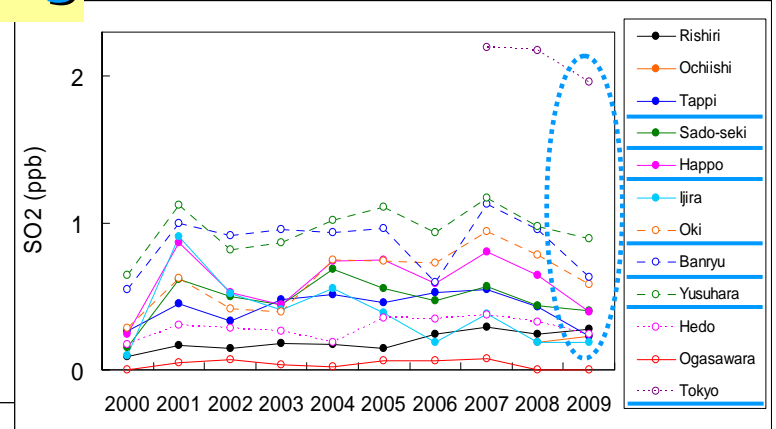
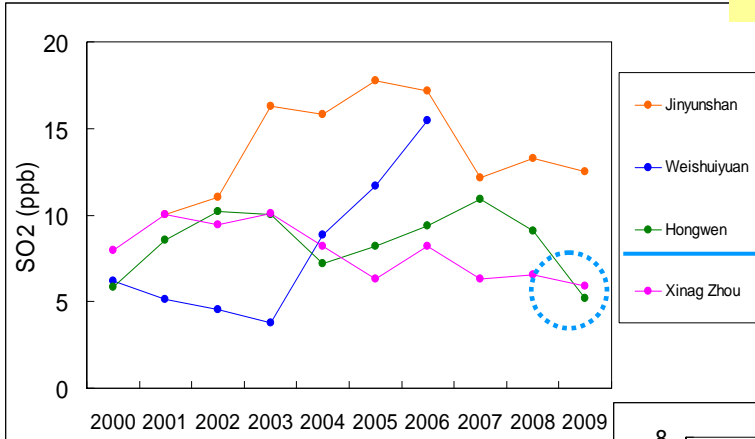


# Annual trend in 2001–2009 (SO<sub>2</sub>)

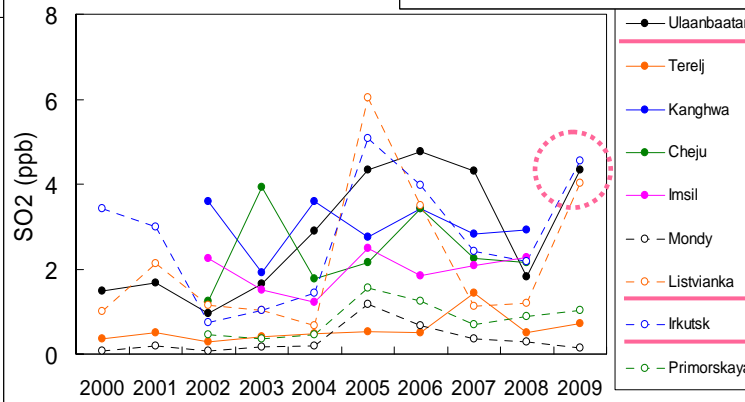
China

Decreasing

Japan

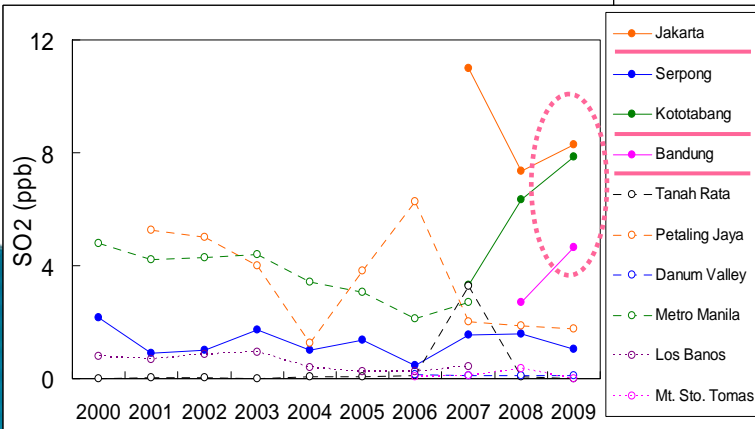


Mongolia, R.Korea, Russia

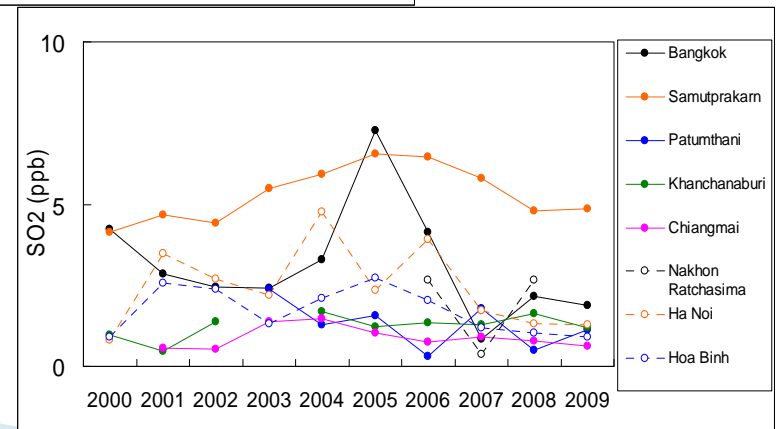


Increasing

Indonesia, Malaysia, Philippines

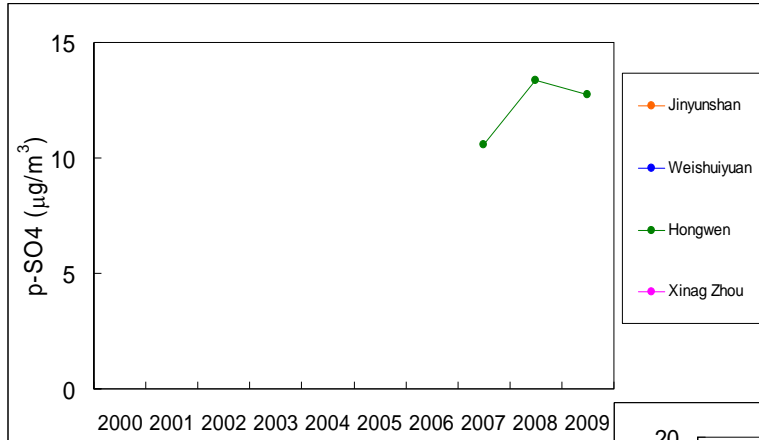


Thailand, Vietnam

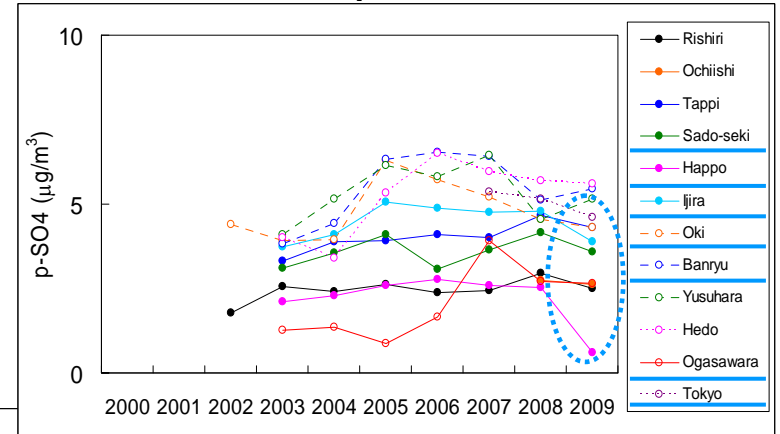


# Annual trend in 2001–2009 ( $\text{SO}_4^{2-}$ in PM)

## China



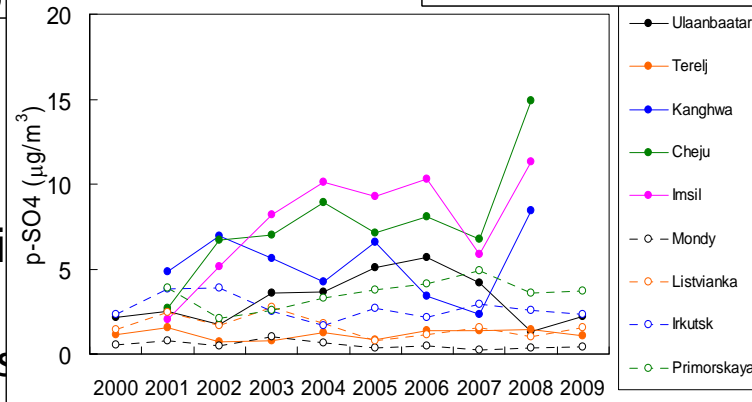
## Japan



**Increasing**

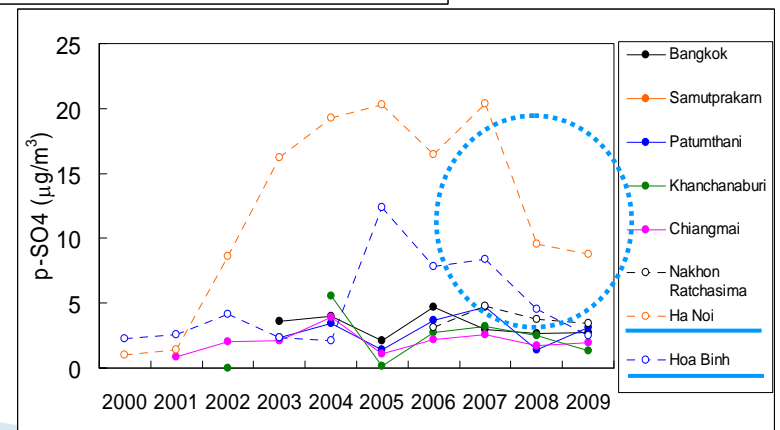
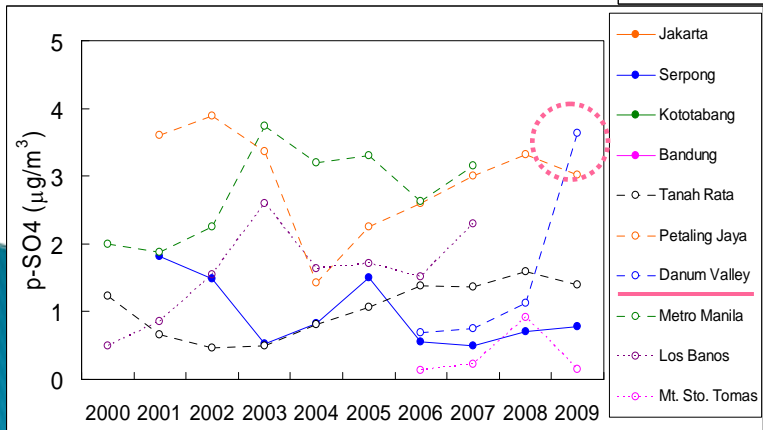
Mongolia, R.Korea, Russia

Indonesia, Malaysia, Philippines



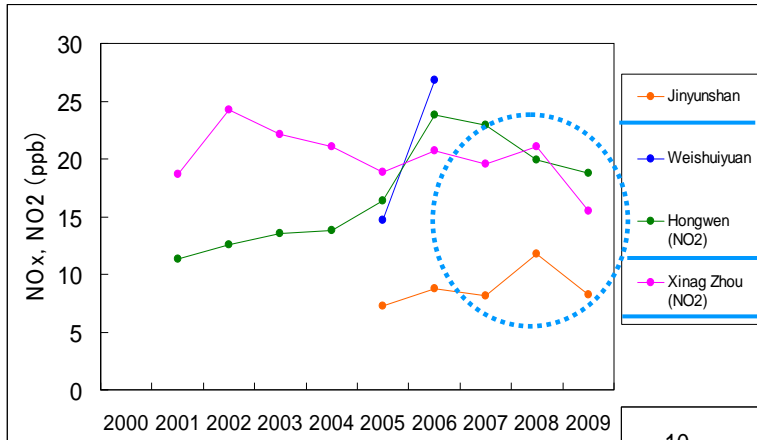
**Decreasing**

Thailand, Vietnam

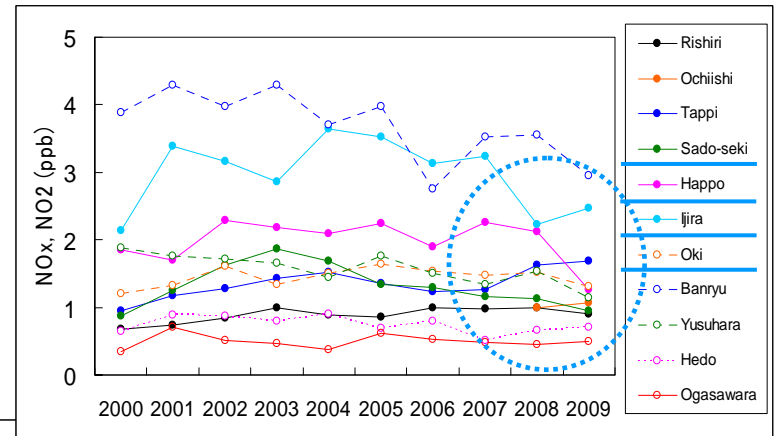


# Annual trend in 2001–2009 (NO<sub>2</sub>, NO<sub>x</sub>)

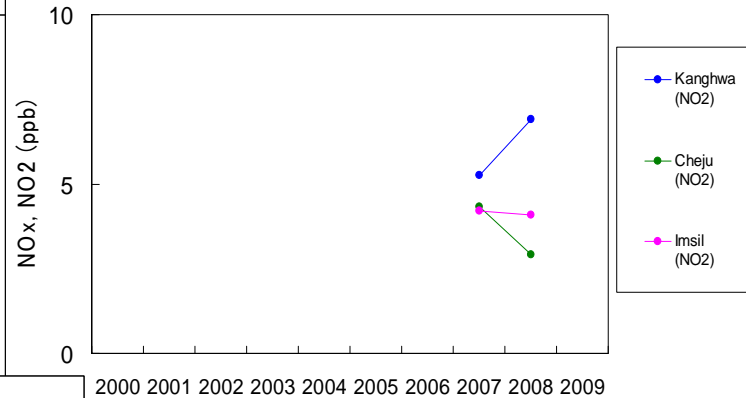
## China



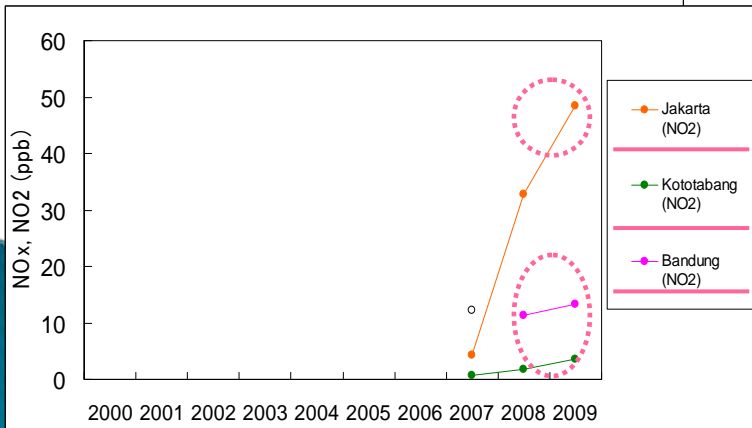
## Japan



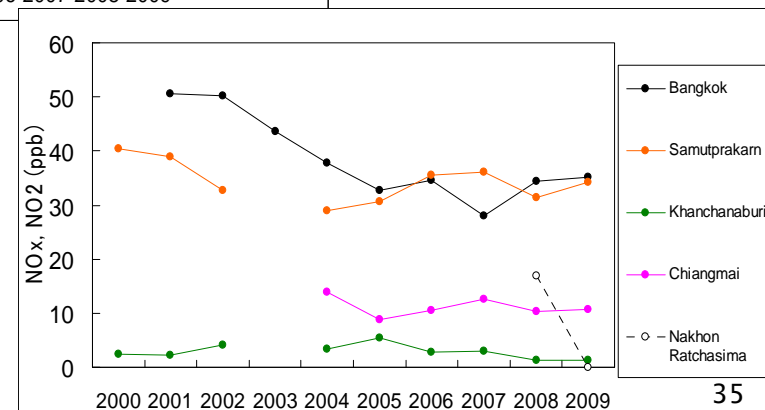
## R.Korea



## Indonesia

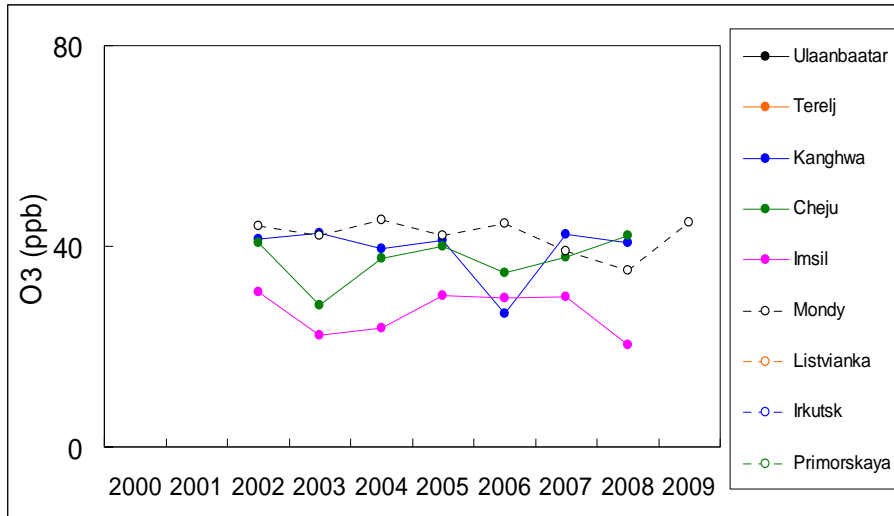


## Thailand



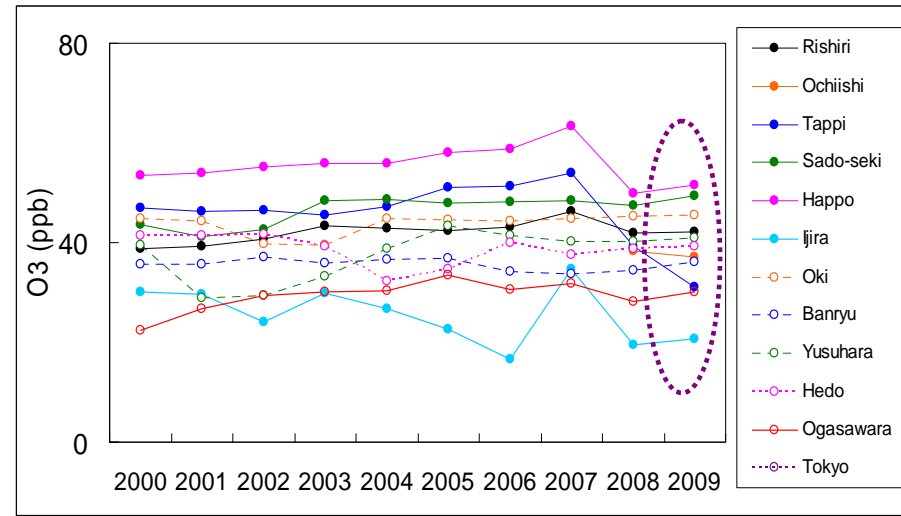
# Annual trend in 2001–2009 (O<sub>3</sub>)

Mongolia, R.Korea, Russia



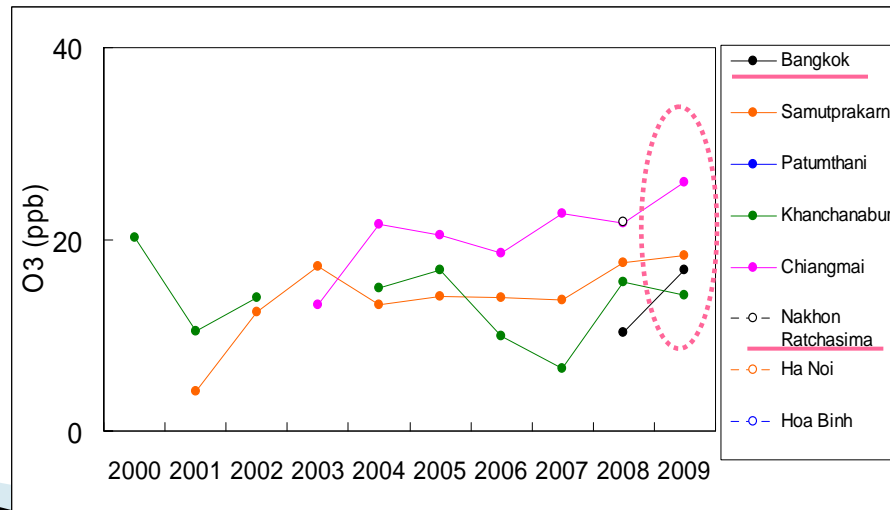
Japan

Same level



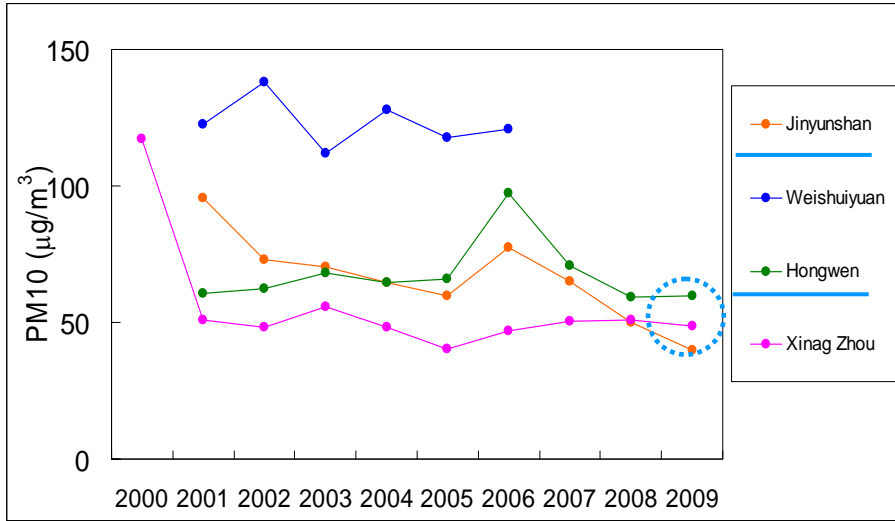
Thailand, Vietnam

Increasing

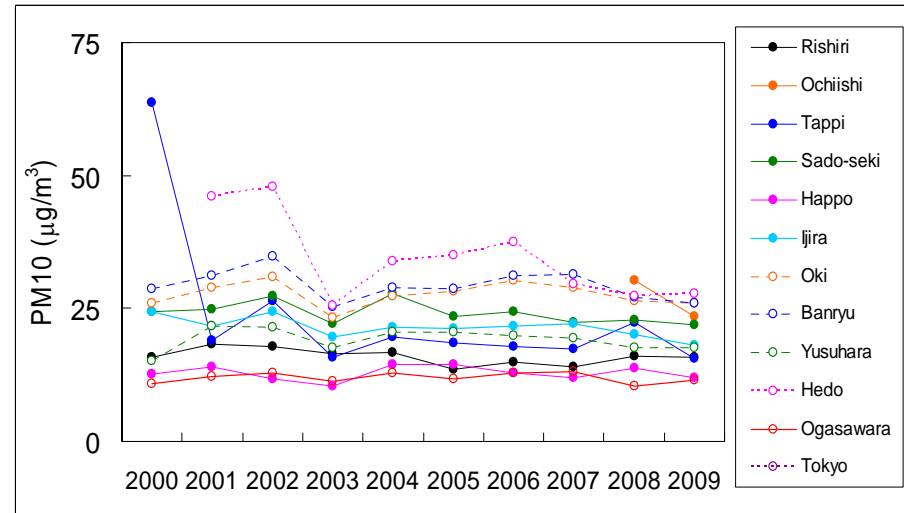


# Annual trend in 2001–2009 (PM<sub>10</sub>)

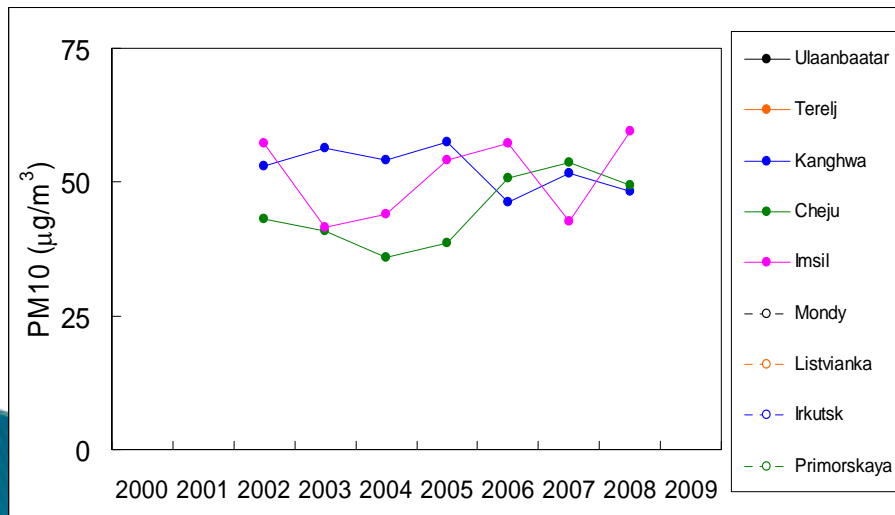
China **Decreasing**



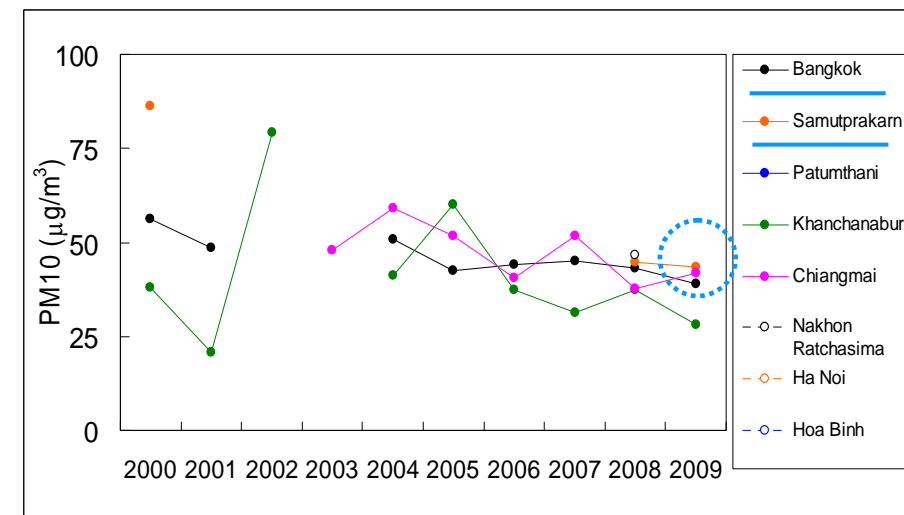
Japan



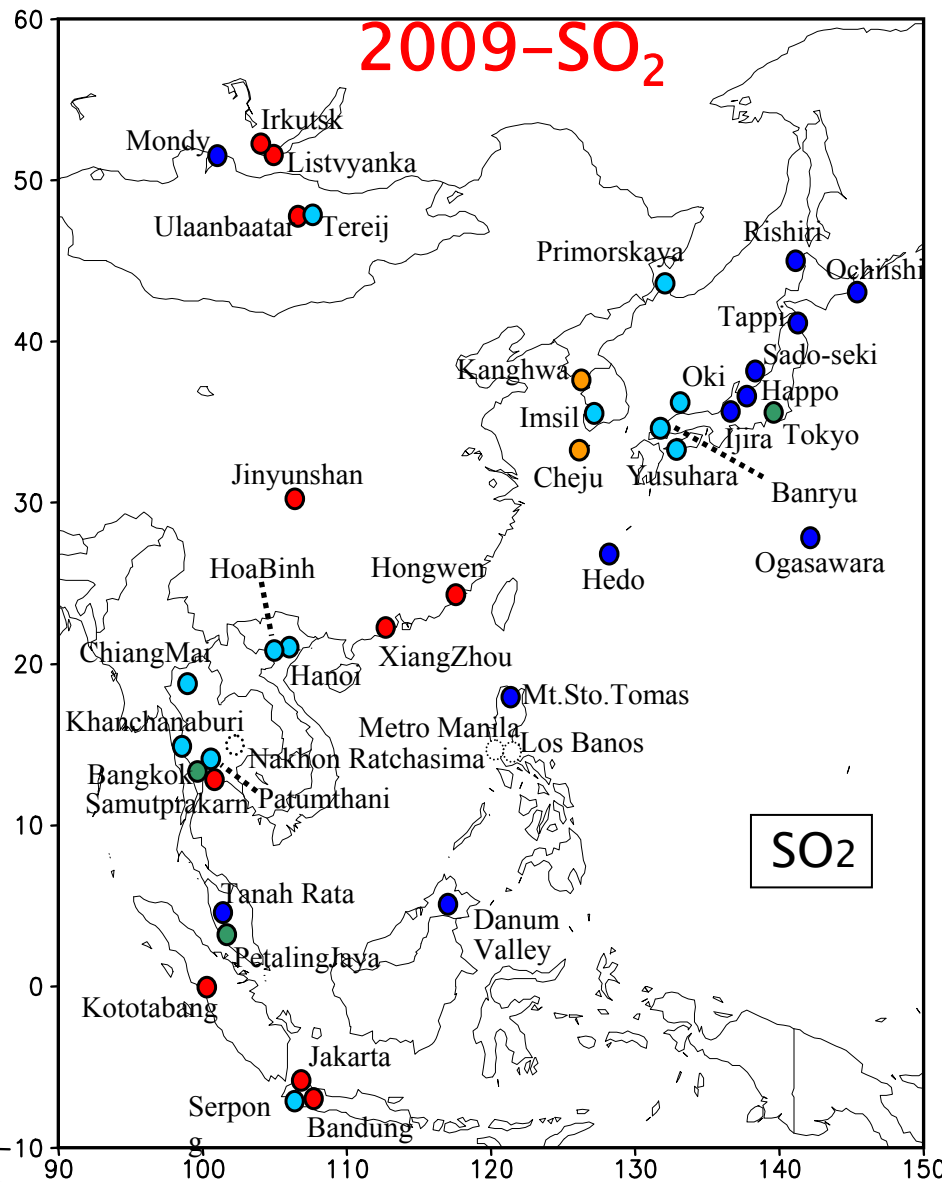
Mongolia, Korea, Russia



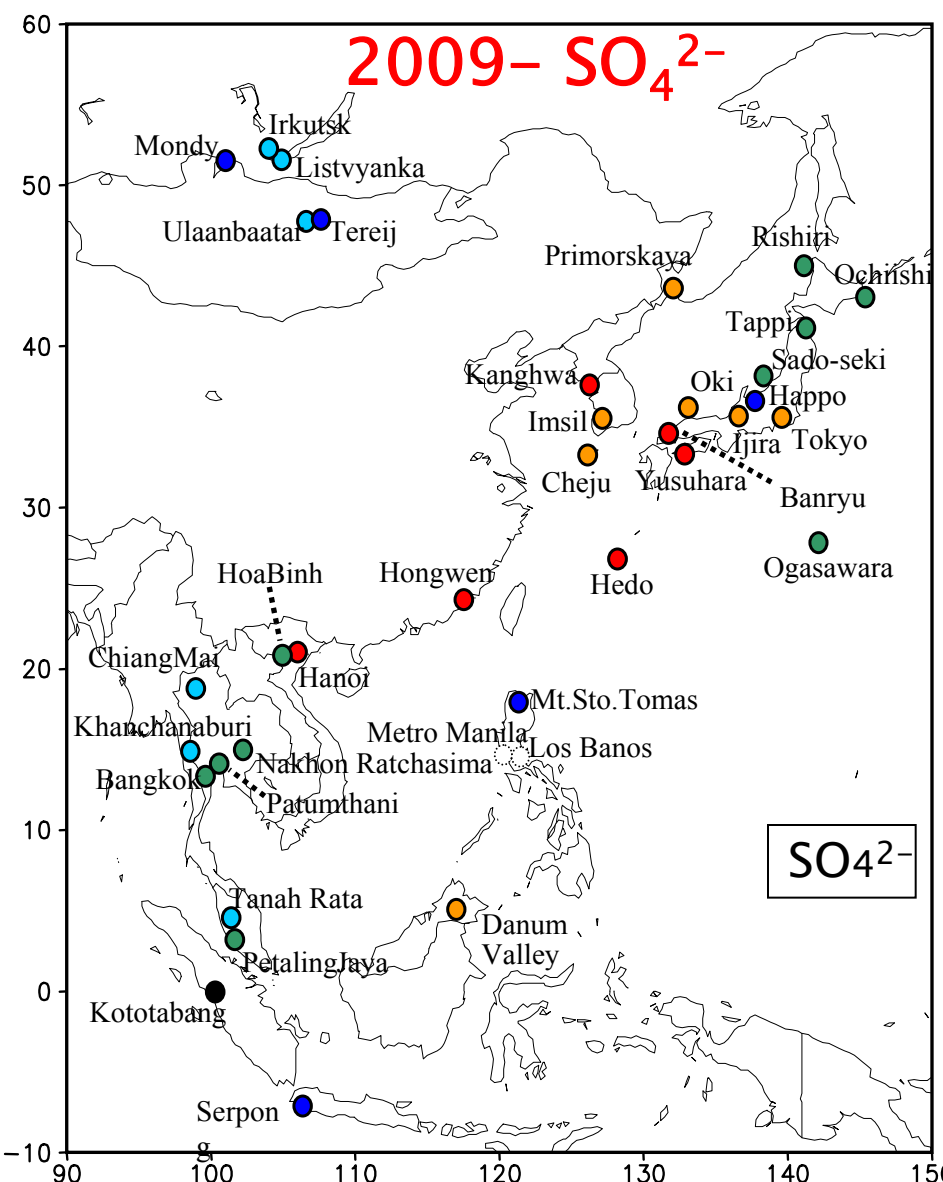
Thailand, Vietnam



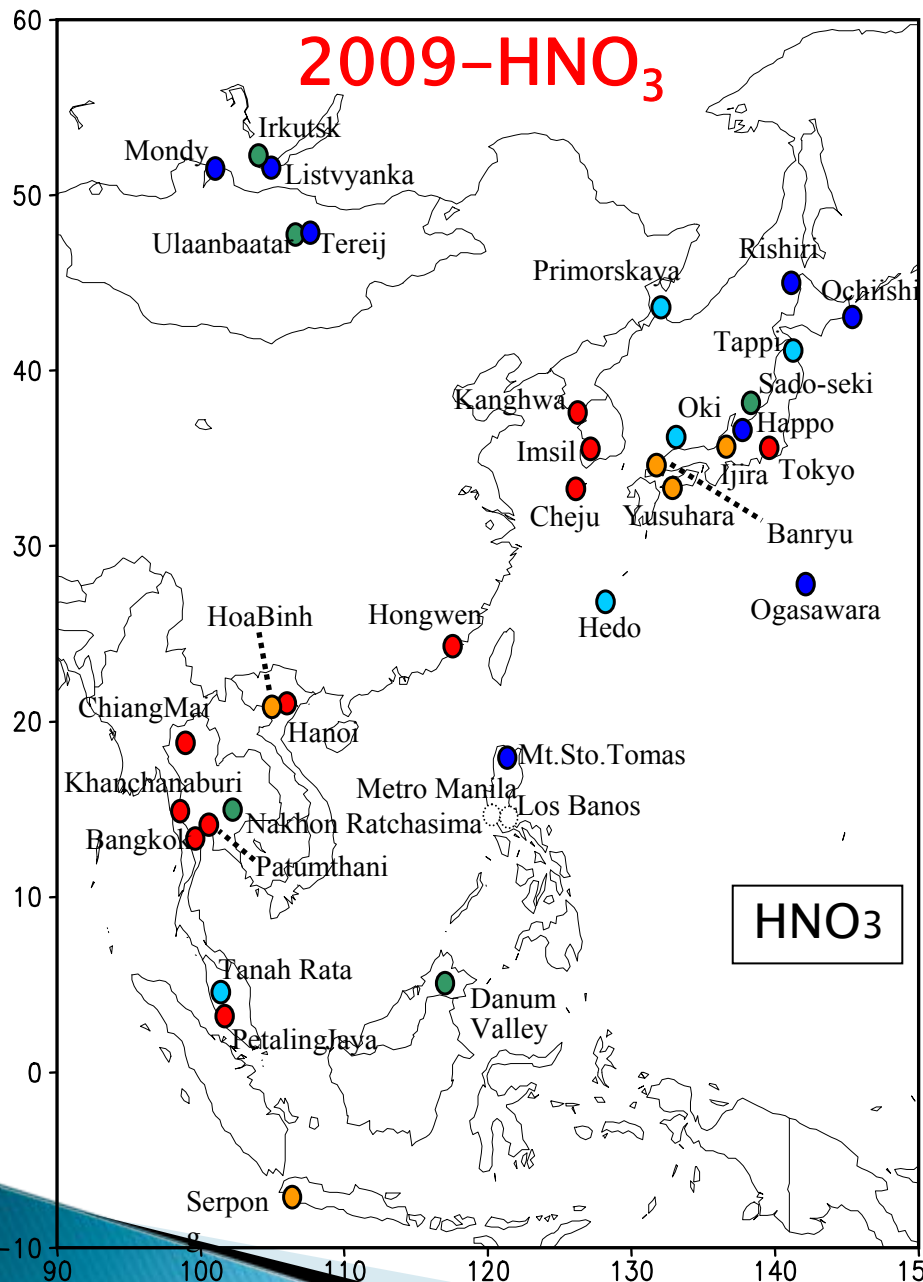
2009-SO<sub>2</sub>



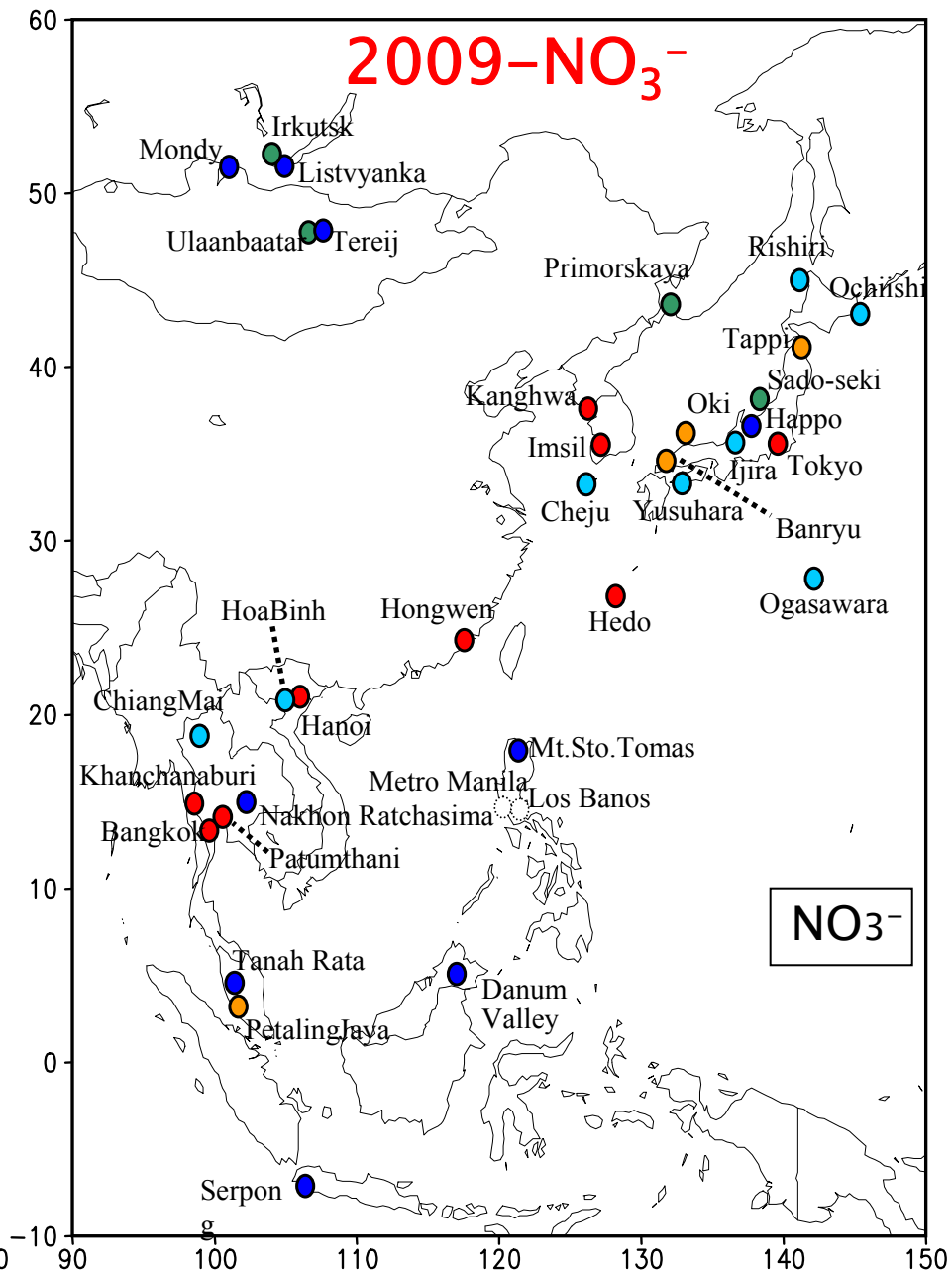
2009-SO<sub>4</sub><sup>2-</sup>



# 2009-HNO<sub>3</sub>



# 2009-NO<sub>3</sub><sup>-</sup>



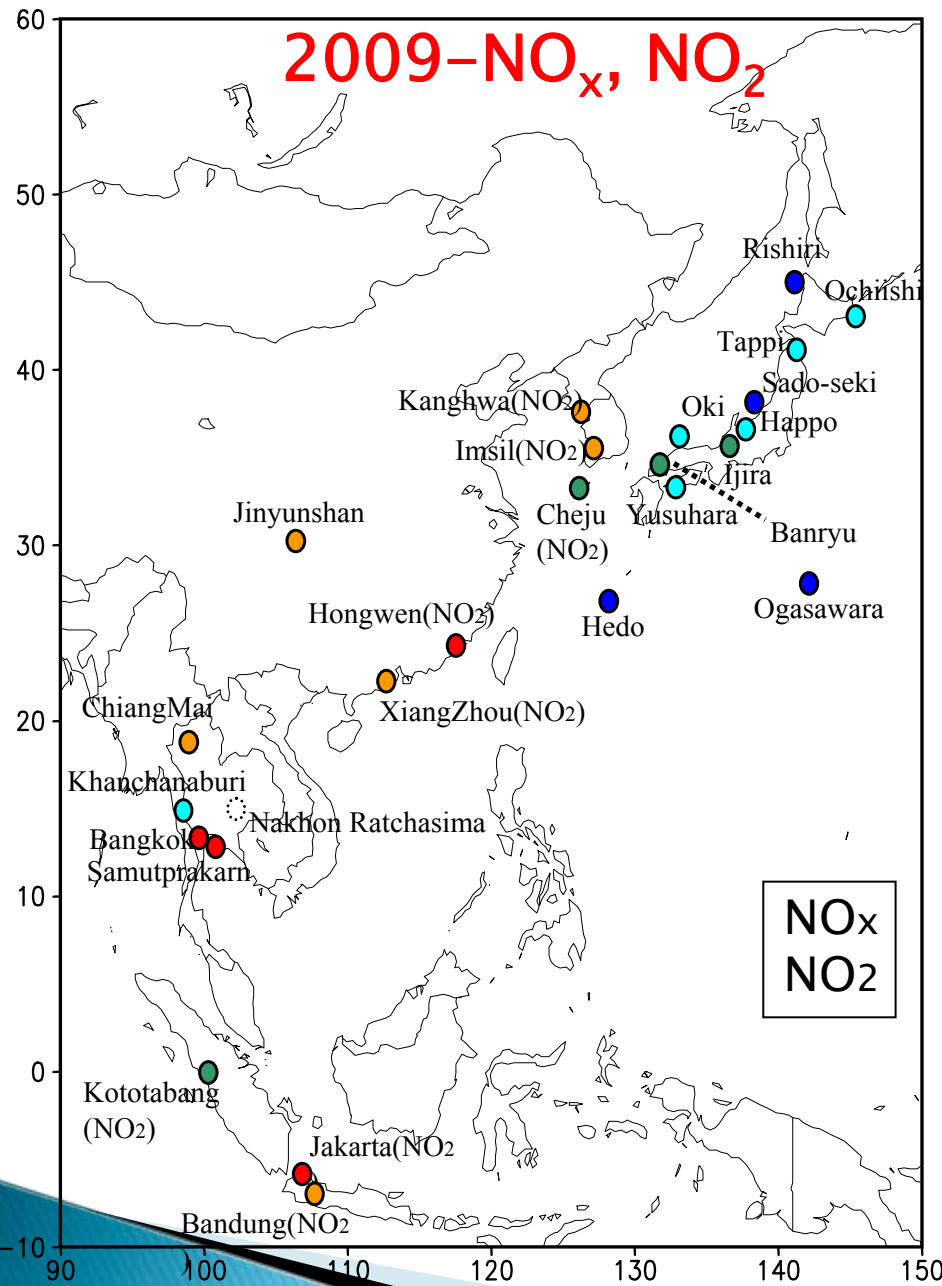
No data < 0.1 0.1-0.2 0.2-0.3 0.3-0.4 0.4-1.0 (ppb)



No data < 0.4 0.4-0.8 0.8-1.2 1.2-1.6 1.6-10 (µg/m<sup>3</sup>)



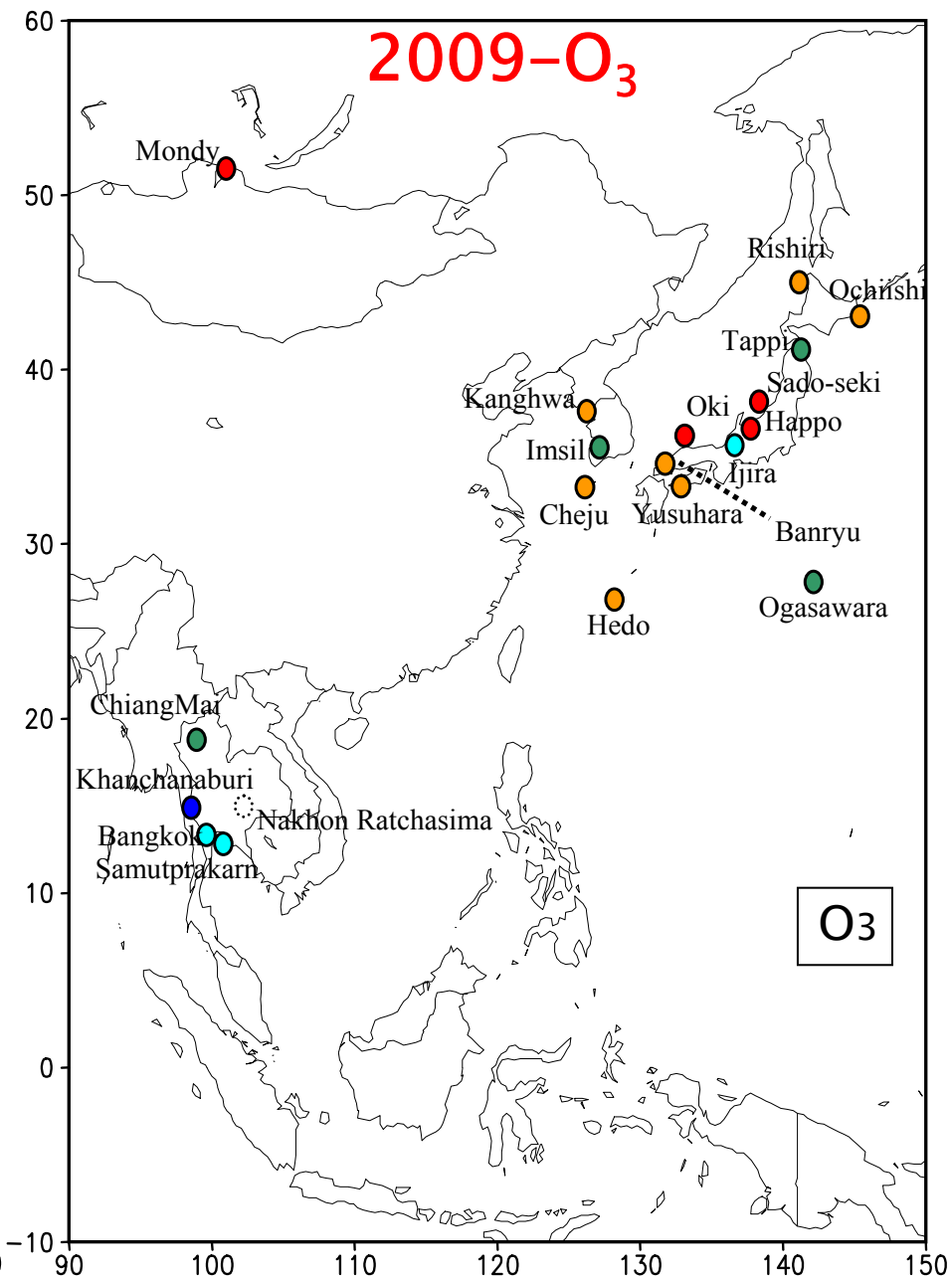
# 2009-NO<sub>x</sub>, NO<sub>2</sub>



No data < 1.0 1.0-2.0 2.0-4.0 4.0-16.0 16.0 < (ppb)



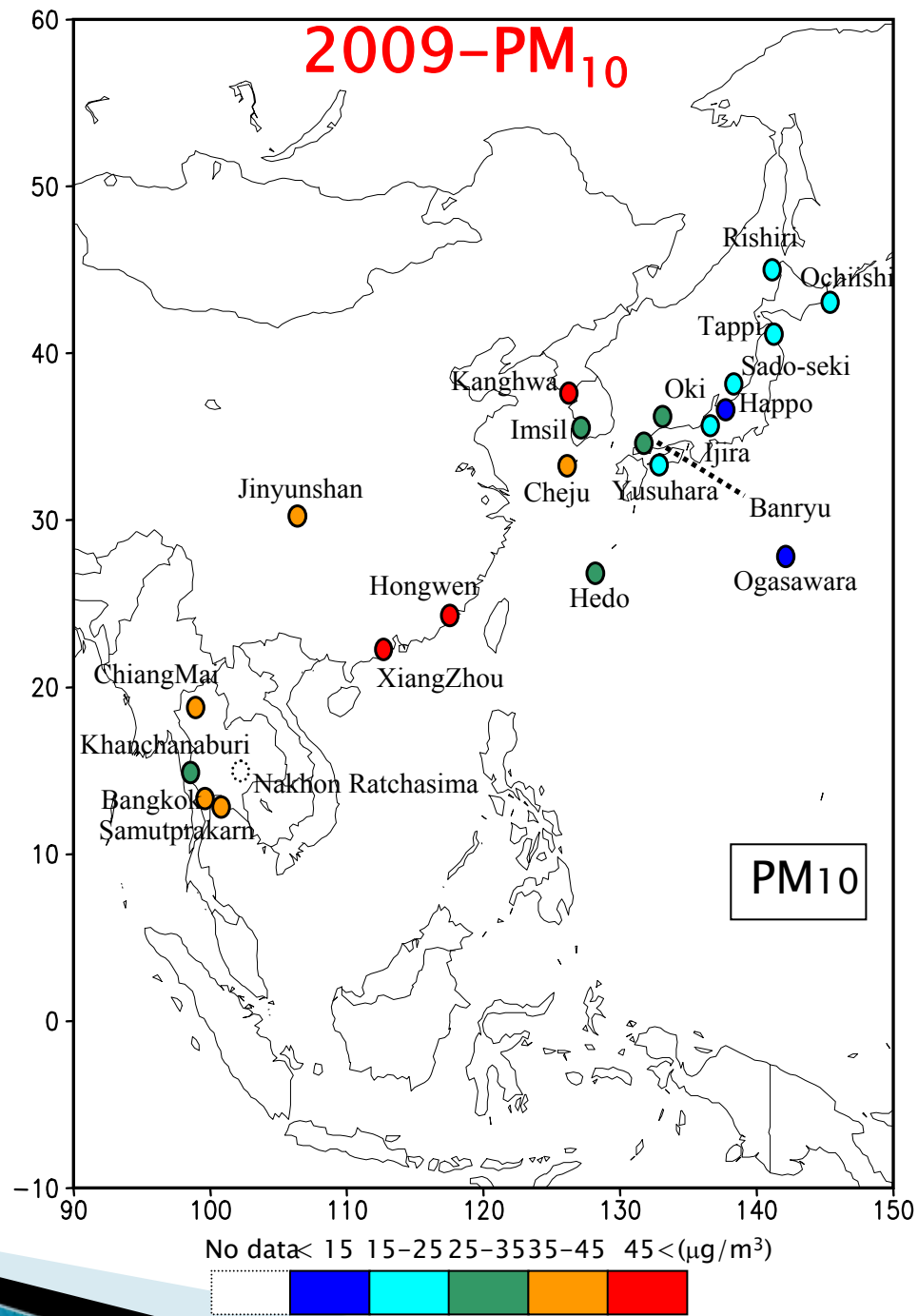
# 2009-O<sub>3</sub>



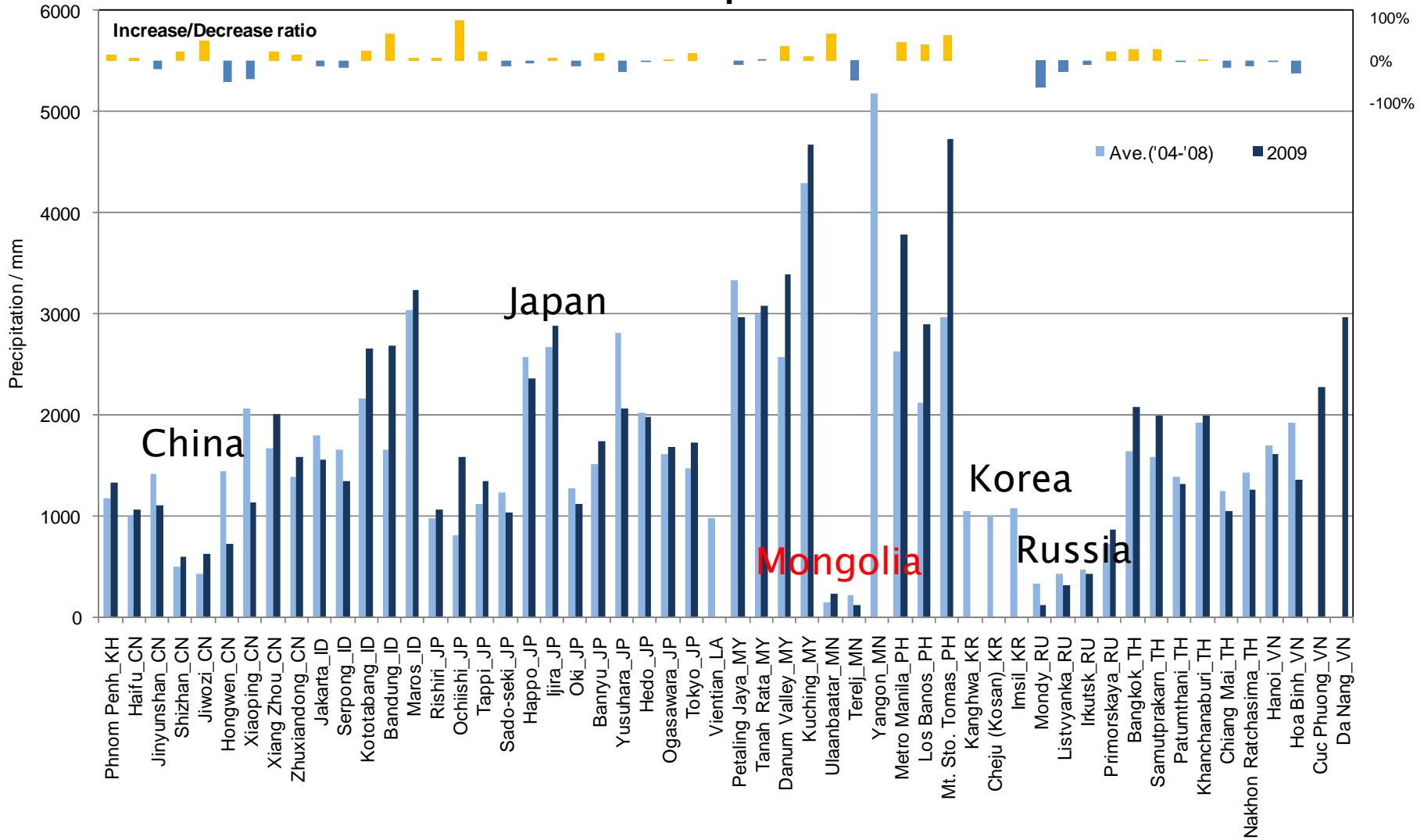
No data < 15 15-25 25-35 35-45 45 < (ppb)



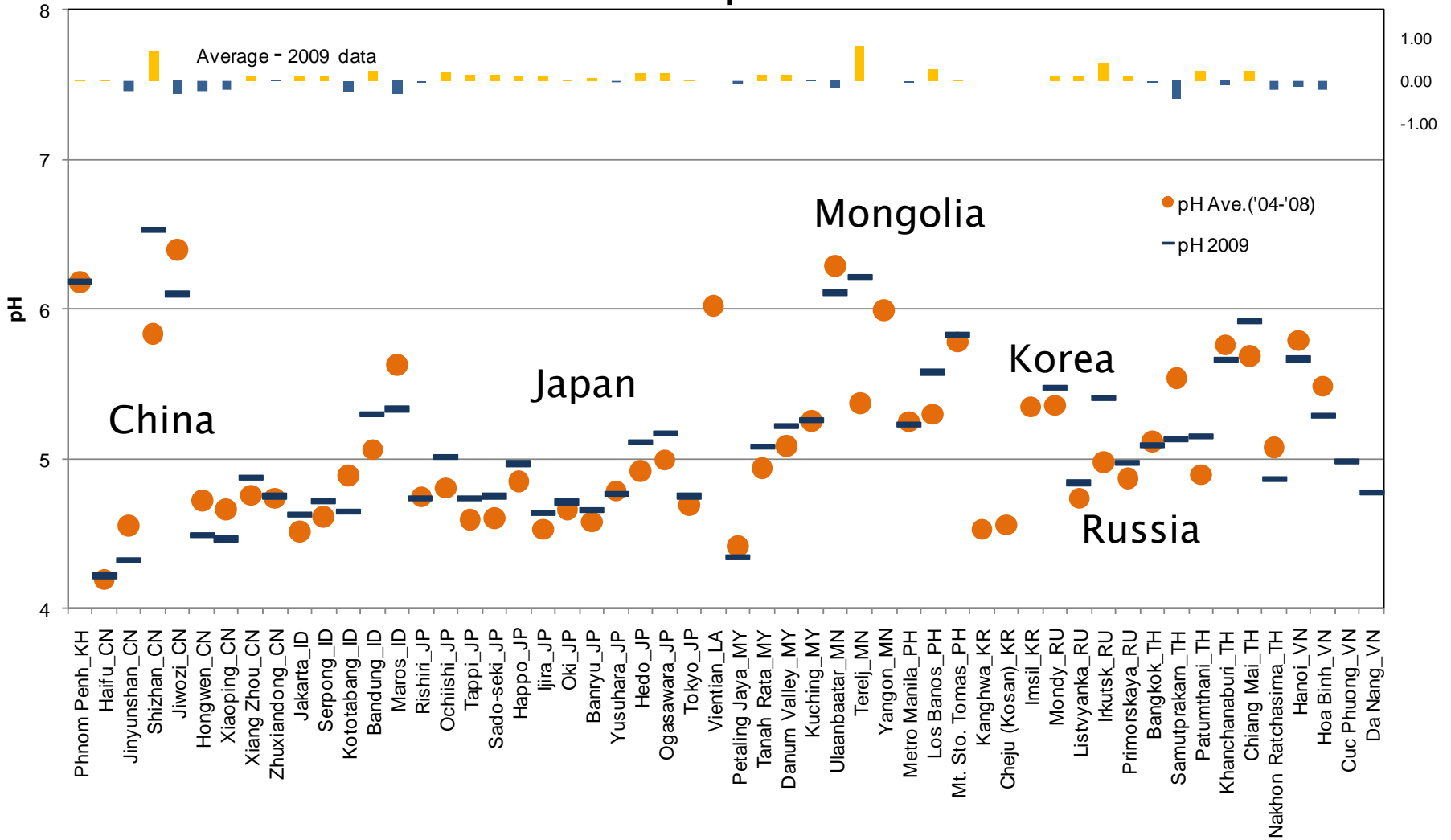




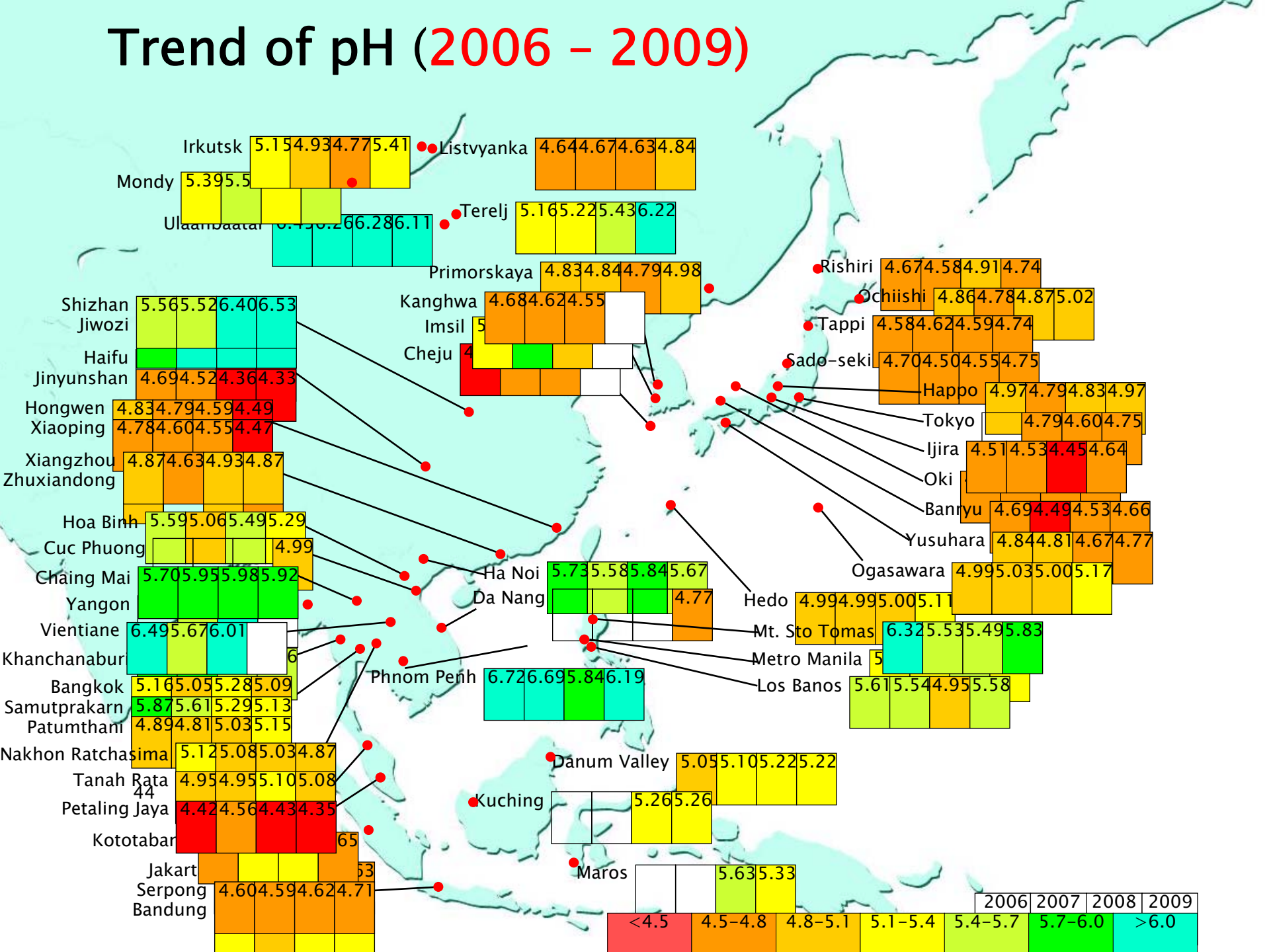
# Results: Precipitation 2009



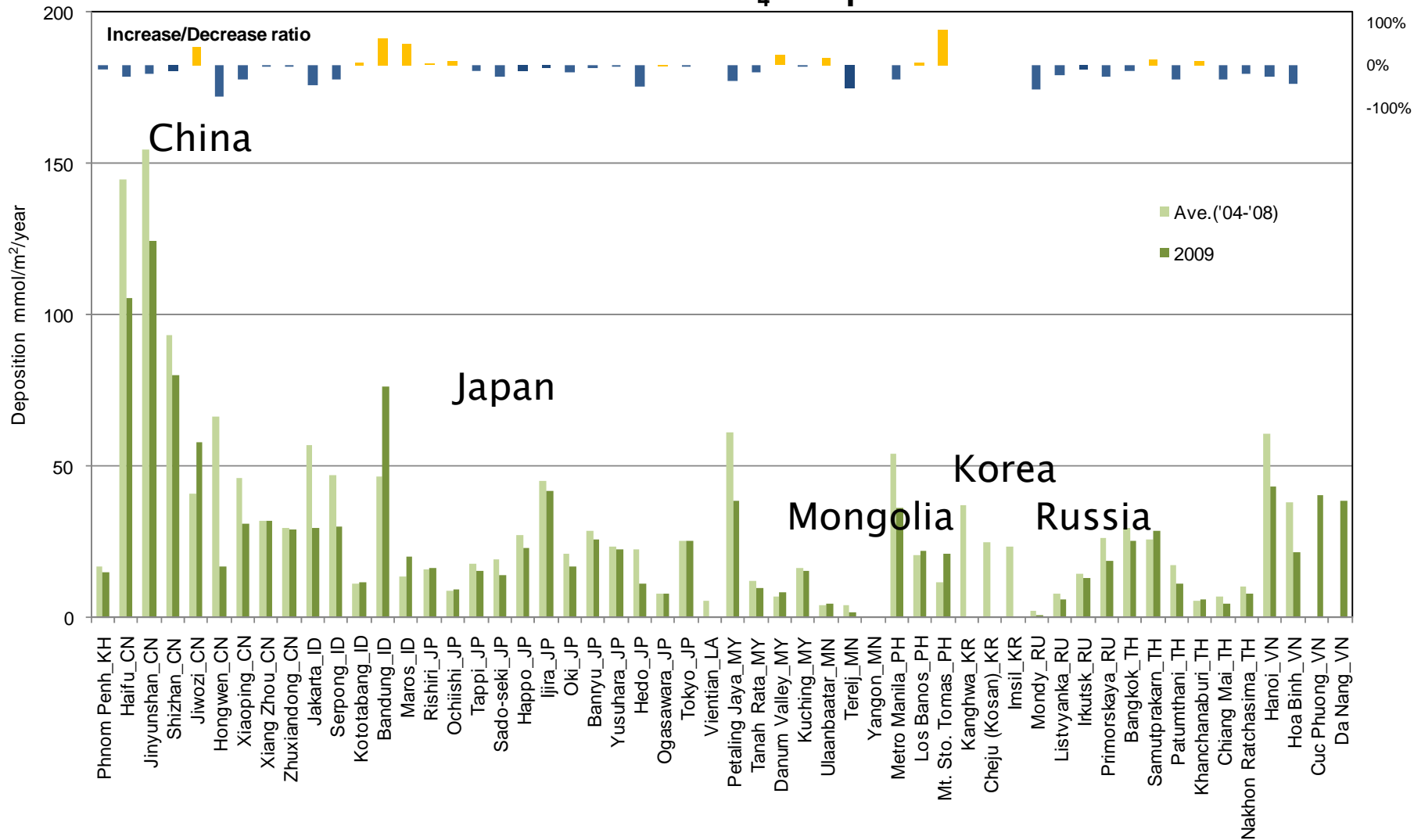
# Results: pH 2009



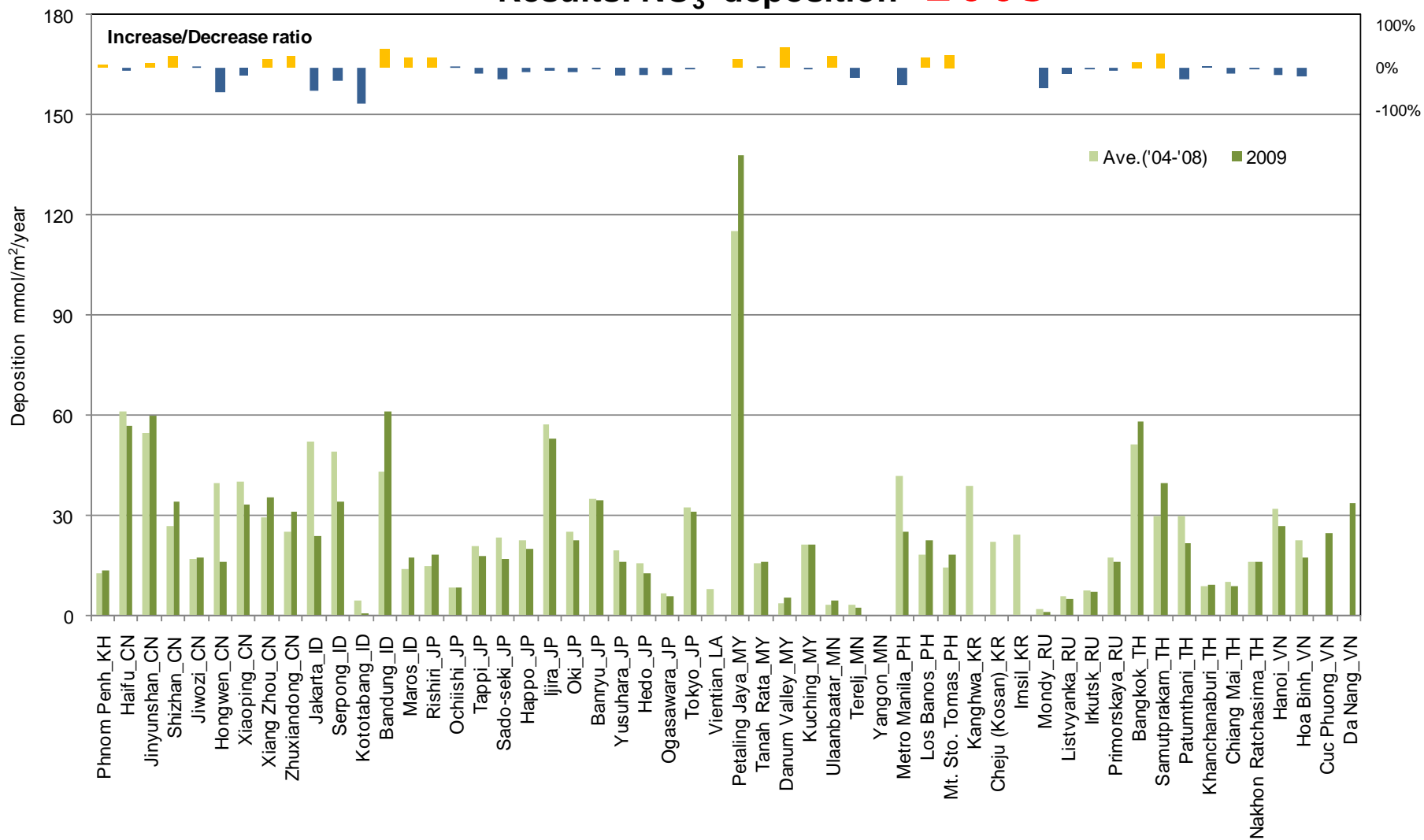
# Trend of pH (2006 - 2009)



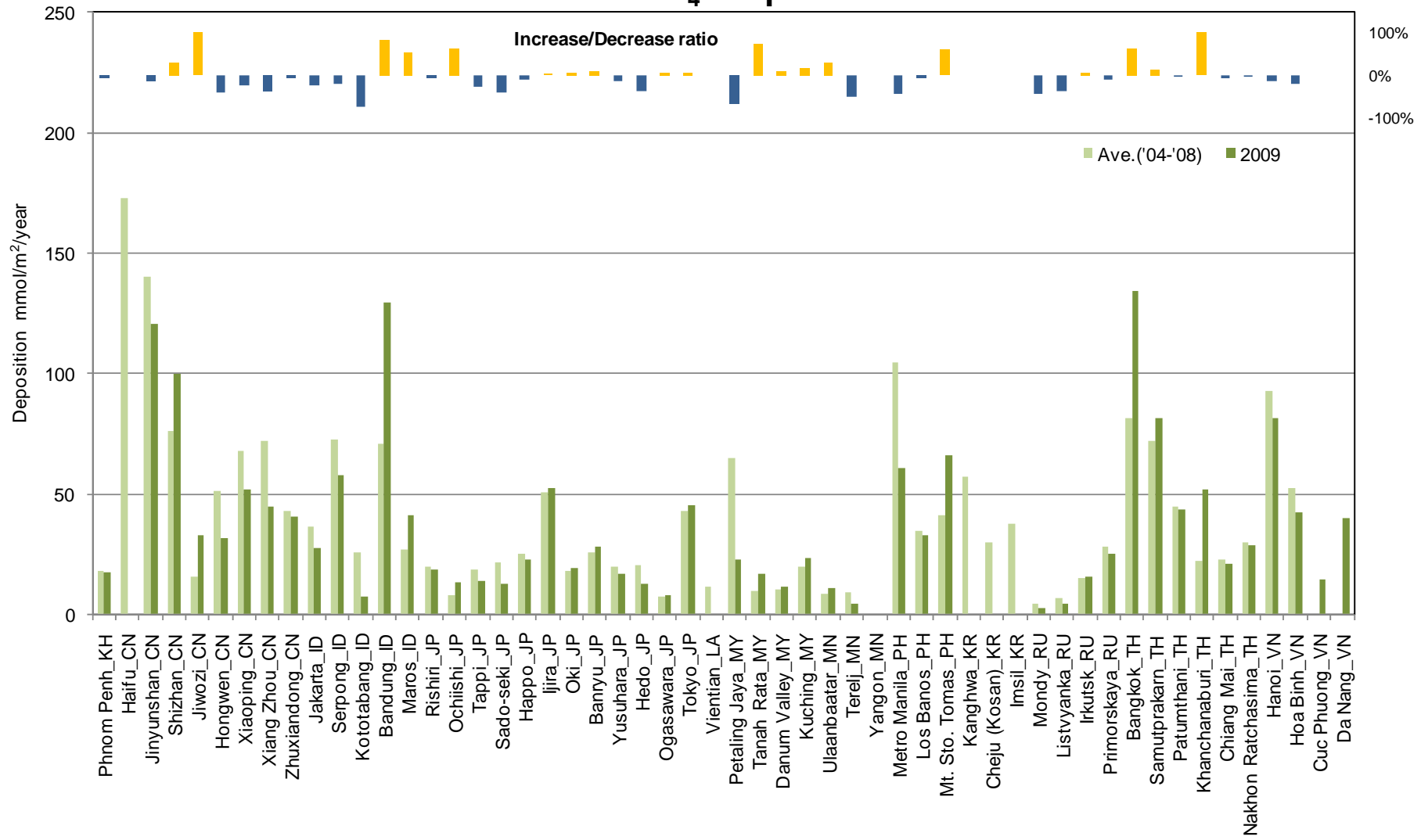
# Results: nss-SO<sub>4</sub><sup>2+</sup> deposition 2009



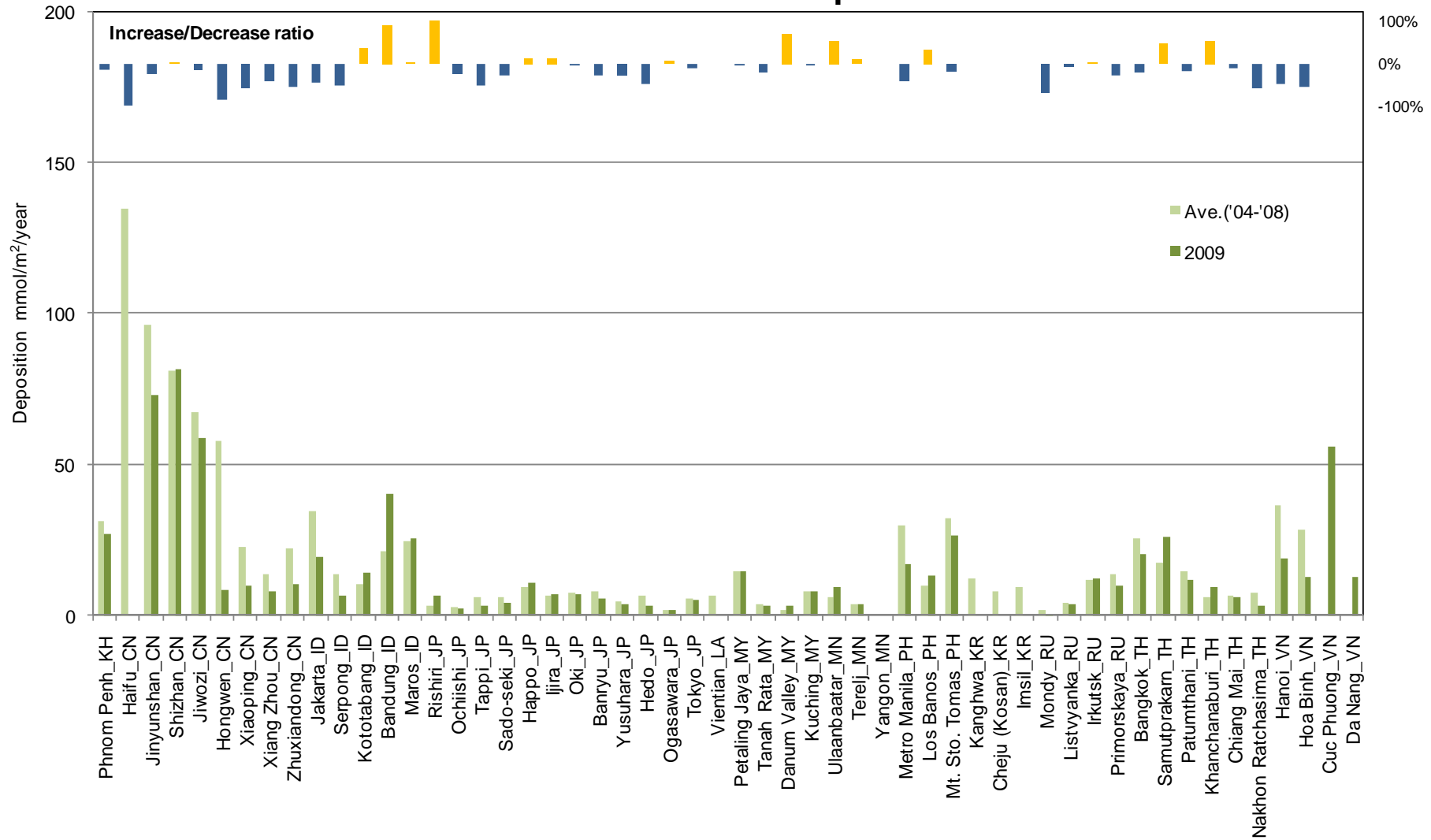
# Results: NO<sub>3</sub><sup>-</sup> deposition 2009



# Results: NH<sub>4</sub><sup>+</sup> deposition 2009



# Results: nss-Ca<sup>2+</sup> deposition 2009





# Conclusions

- Cooperation is very important for EANET participating countries.
- Scientific aspects on technical transfer are emphasised on EANET network.
- Looking forward to completing the signing of the instrument.



**Thank you very much**  
**for your attention**