



The Network Center for the Acid Deposition Monitoring Network in East Asia

SUMMARY OF THE TWENTIETH ANNIVERSARY OF THE EANET



OUTLINE

- (1) Background of development of the Summary**
- (2) Introduction of the contents of the Summary**
- (3) Progress since IG22**
- (4) Action required**



(1) BACKGROUND OF DEVELOPMENT OF THE SUMMARY

Purpose of Development of the Summary

- **At turning point of the 20th Anniversary and scope expansion of the EANET,**
- **Evaluate the data accumulated by the EANET over the past 20 years from the scientific point of view and,**
- **Summarize as a message that is easy to understand the situation of the acid deposition in East Asia for policy makers, the general public and various organizations that can be expected as partners with the EANET in the near future,**
- **Are critically important to consider and design the future of EANET.**



(1) BACKGROUND OF DEVELOPMENT OF THE SUMMARY

IG22 decided

- **To request the Secretariat and the NC**
- **To prepare a draft document**
- **Which summarizes the common understanding of the state of acid deposition problem gained through the EANET 20-years operations for further discussions and scientific inputs from SAC,**
- **To finalize it by IG23, with the view that such document would be useful to attract potential partners of EANET.**



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CONCEPT OF THE SUMMARY

Look back on these 20 years

and **think forward** into the EANET's future:

- What has the EANET been done these 20 years?
- What kind of challenges is the EANET facing?
- How can the EANET deal with the challenges?
- What is the way forward for the EANET?



the Summary also can be fully utilized as an important **outreach material**.



STRUCTURE OF THE SUMMARY

- What is the reason of establishment of the EANET ? What kind of activities that the EANET has been implementing?
- How has the EANET helped to solve air pollution problems in the East Asian region?

PAST

- What is the current state of acid deposition in East Asia?
- How important acid deposition as an environmental problem at present?

PRESENT

- How to understand the importance of co-benefits towards a cleaner environment and sustainable development?
- What are the serious problems of air pollution, and why do we need to assess it in East Asia?

CHALLENGES

- How will the EANET activities change in the future?

**THE WAY
FORWARD** ⁷

(3) What is the current status of acid deposition in East Asia?⁴⁾

In Northeast Asia, the annual amount of acid deposition has decreased in the last twenty years, especially because of decrease of sulfuric acid deposition. At the global level, the amount of acid deposition in the EANET is comparatively higher than the amount reported by the European Monitoring and Evaluation Programme (EMEP) in Europe and reported by the National Atmospheric Deposition Program (NADP) in the North America. This may be partly due to volcanic activity and naturally larger precipitation in East Asia.⁴⁾

Summary of the answer is provided for those who want to review it quickly.



- In the Northeast Asian region, the wet deposition amount of non-sea-salt sulfate ion (nss-SO₄²⁻) and hydrogen ion (H⁺), which are major (representative/typical) indicators of acid deposition, have decreased remarkably not only in urban but also in rural and remote sites.⁴⁾
- In the Southeast Asian region, large wet deposition of these two species and nitrate ion (NO₃⁻) are prominent at some urban sites, showing regional diversity.⁴⁾
- The amount of wet deposition indicated by these indicators is currently higher than those reported by the EMEP (for Europe) and the NADP (for North America), which do not target urban air pollution. Therefore, a higher amount of acid deposition in the EANET region may be due to urban sites monitoring. Additionally, volcanic activity in Northeast Asia and large precipitation amounts in Japan and Southeast Asia may partially be attributed to the large acid deposition observed in this region.⁴⁾

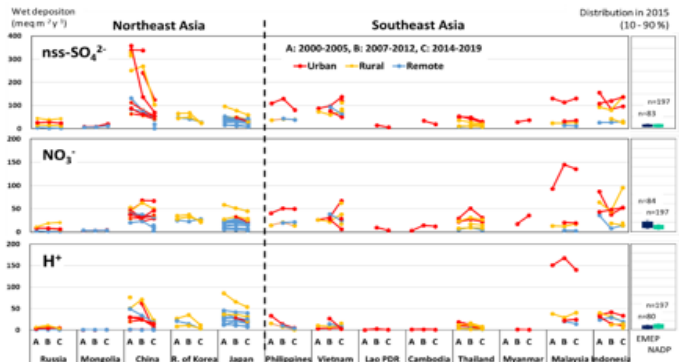


Figure 3. Trends of wet deposition in EANET monitoring sites⁴⁾

(Source: EANET; Data Reports 2001-2020, NADP)⁴⁾

EXAMPLE OF Q&A

The detailed description is provided for those who have the intention to read more or have a strong interest in the contents.



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PROGRESS SINCE IG22

Draft of the Summary

Submission

**LA2 and DC2
for PRSAD4**
(no comments)

**1st
WG**
(comments)

**LA3 and DC3
for PRSAD4**
(comments)

**2nd
WG**
(comments)

1st revision

No Comment

2nd revision

**IG
23**
(Endorsed)

Submission

**3rd revision
If needed**

**SAC
21**
(Approved)



ACTIONS REQUIRED

The SAC21 is invited to review this report and may wish to consider, discuss, make comments and suggestions, and adopt it as appropriate.



The Network Center for the Acid Deposition Monitoring Network in East Asia

REFERENCES



(1) WHAT IS THE REASON FOR THE ESTABLISHMENT OF THE EANET ? WHAT KIND OF ACTIVITIES THAT THE EANET HAS BEEN IMPLEMENTING?

In 1990s, the concern of acid deposition as one of the serious issues arising from the rapid increase in sulfur dioxide (SO₂) emissions was raised in many East Asian countries, mainly because of the fast growing development of secondary industries. For this reason, the Acid Deposition Monitoring Network in East Asia (EANET) was established in January 2001. In 20 years of its existence, the EANET has been implementing various activities such as Monitoring and Reporting, Data acquisition, Capacity Building, Research and Public Awareness.



Figure 1. 2nd Intergovernmental Meeting (Niigata, 2000)

(2) HOW HAS THE EANET HELPED TO SOLVE AIR POLLUTION PROBLEMS IN THE EAST ASIAN REGION?

- To solve acid deposition and related air pollution problems, the essential action is to understand the current status and trends of acid deposition and related air pollution in the region by referring to monitoring data. The EANET has been providing comprehensive monitoring data in the East Asian region, and continuously expanding its monitoring network in the last 20 years. To support policymakers, the EANET has been regularly producing regional assessment reports based on monitoring results from its activities.

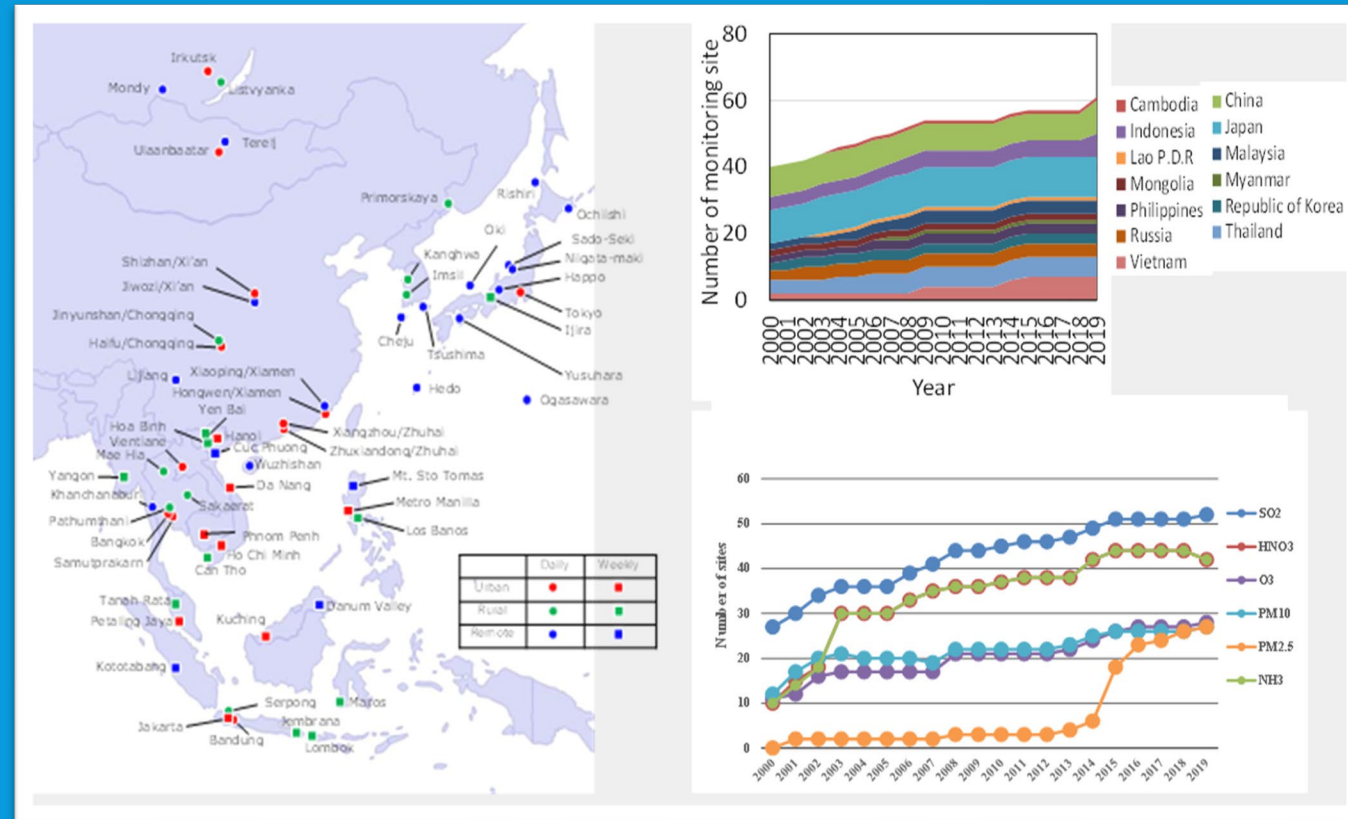


Figure 2. Location of wet deposition monitoring sites in 2019 (left), Numbers of the wet deposition monitoring sites (upper right), and numbers of dry monitoring sites (lower right) in 2000-2019

(3) WHAT IS THE CURRENT STATE OF ACID DEPOSITION IN EAST ASIA?

In Northeast Asia, the annual amount of acid deposition has decreased in the last twenty years, especially because of decrease of sulfuric acid deposition. At the global level, the amount of acid deposition in the EANET is comparatively higher than the amount reported by the European Monitoring and Evaluation Programme (EMEP) in Europe and reported by the National Atmospheric Deposition Program (NADP) in the North America. This may be partly due to volcanic activity and naturally larger precipitation in East Asia.

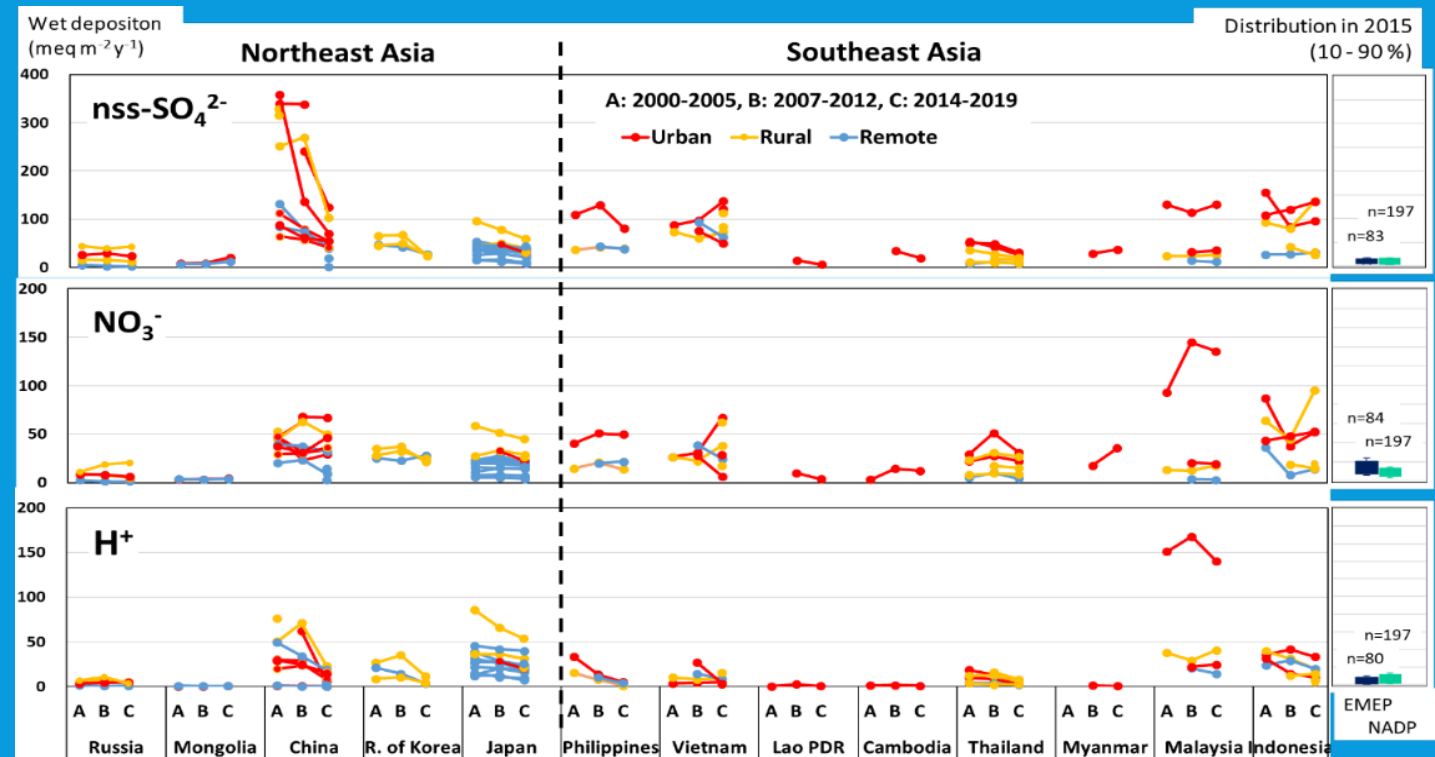


Figure 3. Trends of wet depositio in EANET monitoring sites (Source: EANET; Data Reports 2001-2020, NADP)



(4) HOW IMPORTANT ACID DEPOSITION AS AN ENVIRONMENTAL PROBLEM AT PRESENT?

- The acid deposition problem is not only an acidification problem, but also a problem of various other related pollutants, including nitrogen compounds, which deposit together with acidic substances. Excessive nitrogen deposition in addition to acidic substances can influence the health and resilience of eco-systems.
- Atmospheric ozone and particulate matters (PMs), generated in connection with the acidic pollutants, can also cause similar adverse effects on ecosystems including crops. It is important to monitor and control the various acid deposition and related air pollutants. With great effort of Participating Countries, the acid deposition problem in the region has been greatly improved. These experiences and best practices accumulated during the past 20 years can contribute to the control and management of other air pollutants.



(5) HOW TO UNDERSTAND THE IMPORTANCE OF CO-BENEFITS TOWARDS A CLEANER ENVIRONMENT AND SUSTAINABLE DEVELOPMENT?

The evidence suggests that the climate change and atmospheric issues are likely to be solved simultaneously if coordinated measures and actions from the governments, enterprises and the public are undertaken, with consideration on co-benefits during the design and implementation of related strategies.

Sectoral Mitigation Measures	Effect on Environment
Energy Supply	
Nuclear replacing coal power	Ecosystem impact via air pollution (m/h) and coal mining (l/h)
Renewable energy (wind, photovoltaic (PV), concentrated solar power (CSP), hydro, geothermal, bioenergy) replacing coal	Ecosystem impact via air pollution (except bioenergy) (m/h)
Transport	
Reduction of fuel carbon intensity: electricity, hydrogen (H ₂), compressed natural gas (CNG), biofuels	Ecosystem impact of electricity and hydrogen via urban air pollution (m/m)
Reduction of energy intensity	Ecosystem and biodiversity impact via reduced urban air pollution (m/h)
Compact urban form and improved transport infrastructure Modal shift	Ecosystem impact via reduced urban air pollution (r/h)
Journey distance reduction and avoidance	Ecosystem impact via urban air pollution (r/h)
Buildings	
Fuel switching, incorporation of renewable energy, green roofs, and other measures reducing GHG emissions intensity	Health impact in residential buildings via outdoor air pollution (r/h), indoor air pollution (r/h)
Retrofits of existing buildings (e.g., cool roof, passive solar, etc.) Exemplary new buildings efficient equipment	Health impact via outdoor air pollution (r/h), indoor air pollution (r/h)
Industry	
Material efficiency of goods, recycling	Ecosystem impact via reduced local air and water pollution and waste material disposal (m/m)
Human Settlements and infrastructure	For co-benefit of compact urban form and improved transport infrastructure, see also Transport
Increased accessibility	Air quality and reduced ecosystem and health impacts (m/h)
Mixed land use	Air quality and reduced ecosystem and health impacts (m/h)



(6) WHAT ARE THE SERIOUS PROBLEMS OF AIR POLLUTION, AND WHY DO WE NEED TO ASSESS IT IN EAST ASIA?

- Impacts of air pollution on public health and ecosystems remain a significant concern in East Asia. Research about human health and possible impacts of particulate depositions on tree species and atmospheric ozone pollution on agricultural production have been developed in East Asia.
- Recent studies suggest the complexity of atmospheric behaviors of air pollutants and those effects. Assessment on effectiveness of various measures contributing to emission reduction of acid deposition and related air pollution considering the adverse effects caused by multiple air pollutants is necessary, which could lead to applicable measures to further improve the air quality.



(7) HOW WILL EANET ACTIVITIES CHANGE IN THE FUTURE?

- The EANET could expand its scope from current activities focusing on monitoring acid deposition to atmospheric environmental substances and related activities, subject to the approval of all Participating Countries.
- The EANET could continuously enhance and strengthen cooperation and collaboration among Participating Countries by introducing new joint projects.
- At the same time, the EANET could strengthen its cooperation with relevant international organizations, research institutes, and countries, including the diversification of its funding mechanisms. Subsequently, the EANET could flexibly deal with atmospheric environmental problems and exert synergistic effects in the East Asian region.

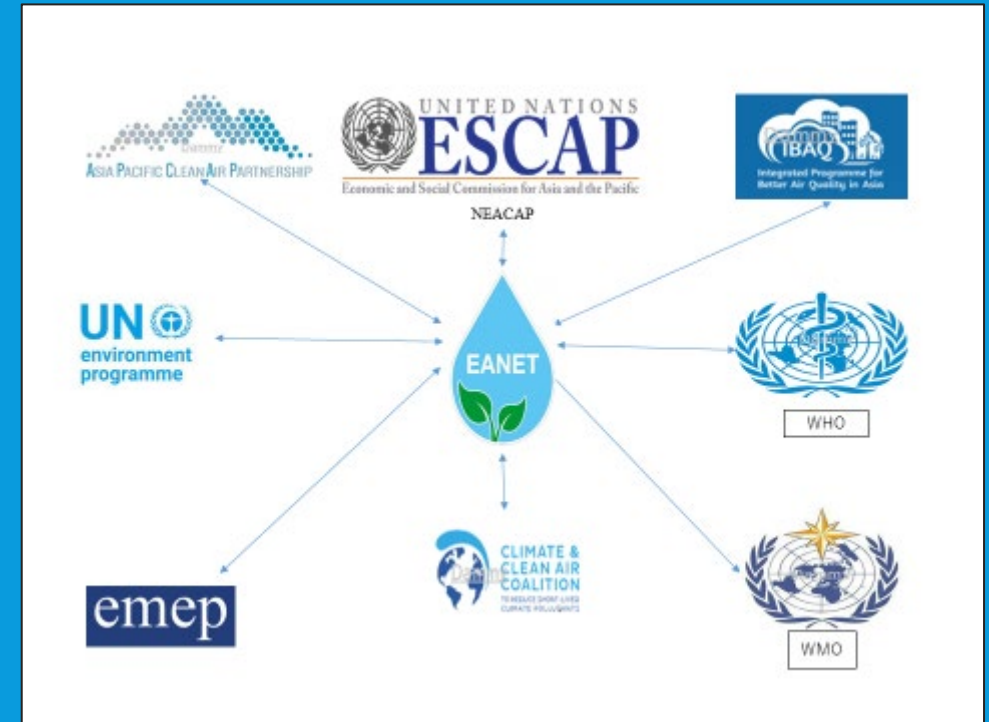


Figure 4. Strengthening cooperation with other international organization