

The Twenty-third Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network in East Asia
28 and 29 September 2022, Online Platform

MINUTES OF THE MEETING

I. Introduction

1. The Twenty-third Senior Technical Managers' Meeting (STM23) on the Acid Deposition Monitoring Network in East Asia (EANET) was held online on 28 and 29 September 2022. The Meeting was organized by the Network Center (NC) for the EANET in collaboration with the Secretariat for the EANET.
2. Senior technical officials, who were involved in the EANET monitoring activities from Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Russia, Thailand and Viet Nam, participated in the Meeting. The Secretariat of the EANET and the representatives of the NC attended the Meeting. The List of Participants is attached as Annex.

II. The opening of the Meeting (Agenda 1)

3. The meeting was opened by the NC.
4. Dr. Shiro Hatakeyama, Director General, Asia Center for Air Pollution Research (ACAP), delivered the Opening Remarks. He expressed the objectives of this annual meeting to exchange information on the current status of the EANET monitoring activities, including the draft Data Report 2021, the results of the Inter-laboratory Comparison Project 2021, and the National Monitoring Plans (NMPs). He also mentioned the scope expansion of the EANET and the implementation of the EANET Project would hopefully contribute to get more fruitful results of monitoring in each country.
5. Mr. Bert Fabian, Coordinator, Secretariat for the EANET, delivered the Welcome Remarks. He welcomed to all participants for the twenty-third Senior Technical Managers meeting on behalf of the United Nations Environment Programme and the Secretariat for the EANET. He also appreciated your efforts, hard work, and strong ambition to support the EANET and to improve the Region's problems on acid deposition and air pollution. He believes that the participating countries and the EANET can play a more leading role in managing air pollution issues in the Region.

III. Election of the Officers (Agenda 2)

6. Basically, at the STM meetings, two Co-chairpersons have been elected from the participating countries. However, as STM23 was held virtually and its meeting time was significantly shortened, the NC proposed to Dr. Tsuyoshi Ohizumi, the QA/QC Manager of the EANET, Head of Data Management Department, to proceed with the meeting smoothly as a moderator.

IV. Adoption of the Agenda (Agenda 3)

7. The Agenda was adopted as proposed (EANET/STM 23/3/1).

V. Progress of EANET activity (Agenda 4)

8. The NC presented the progress of the EANET activity since STM22 (EANET/STM 23/4), which includes the decision on scope expansion of the EANET, the mechanism of Project Fund and Project Activity, and draft project plans in 2023. The meeting was invited to discuss and provide comments, as appropriate.
9. Major discussions on this agenda included the following:
- There is no comment or suggestion.

VI. Overview of the Preliminary Draft Data Report 2021 (Agenda 5)

10. The NC presented the Preliminary Draft Data Report 2021 (EANET/STM 23/5), which contains wet deposition, dry deposition (air concentration), soil and vegetation, inland aquatic environment and catchment-scale monitoring based on monitoring data submitted by the participating countries.. The meeting was invited to discuss and provide comments, as appropriate.
11. Major discussions on this agenda included the following:
- (Wet deposition)
- i. The NC informed that Gunung Brinchang, Malaysia was newly registered as the EANET monitoring site instead of Tanah Rana.
 - ii. The NC requested Cambodia and Lao P.D.R to submit their data, and informed that the data from Philippines and Russia had not been reflected in the Data Report 2021 yet.
 - iii. The NC recommended re-checking data to analysts whether there is something wrong when the deviation showing as the arrows is huge.
 - iv. No comment was given in this item.
- (Dry deposition)
- i. The NC explained that the report hasn't been finalized yet, still expected some results from some countries to be submitted, and still discussed with some countries how to compile their data. Additionally, the NC received some FP results from Russia and the Philippines's Metro Manila recently, so that their results should be updated and reflected by the SAC meeting.
 - ii. Three FP results of 2020 from R of Korea arrived, since the Data Report 2020 was already published, their compiled results will be put in Appendix on the Data Report 2021.
 - iii. It was confirmed if the calculation of dry deposition flux will be conducted for the Data Report.

The NC informed that the flux estimation should be calculated for the Data Report 2021 by the SAC meeting.

(Soil and Vegetation)

- i. Observation of the tree decline and surveys for soil, forest and understory were conducted in China and Japan in 2021.
- ii. No pronounced changes have been observed in soil and vegetation condition.
- iii. The NC asked QAQC manager of China some questions about dataset; if 1) checking sample No. and sub-plot No. for Zhuhai-Zhuxiandong, 2) checking their soil moisture data because they were too low, and 3) revising the description of DBHs of bushy stands (Zhuxianong forest survey), and 4) considering how to handle Geleshan site because this site was not included in NMPs.
- iv. As for changes in tree decline symptoms in the respective sites, it was clarified that the graphs showed cumulative percentages of six observed variables, which may become 600% at the maximum and therefore sometimes over 100% like those in Chinese sites. Since some sites did not conduct the observation annually, it was difficult to compare actual changes in each variable.
- v. The NC also confirmed that it was difficult to compare between 2021 and the previous years in some sites in China because the tree decline observation was not conducted every year.

(Inland aquatic environment)

- i. The NC informed that Philippines and Russia have just submitted the data before STM23. The NC requested Cambodia, Indonesia, Lao PDR, and Malaysia to submit data.
- ii. No comment was given in this item.

(Catchment-scale)

- i. The catchment-scale analysis had been conducted in Lake Ijira, Japan and La Mesa Watershed, Philippines.
- ii. The NC is still waiting for the data of La Mesa Watershed. (Please note; After the presentation, the NC realized that the data of La Mesa Watershed, Philippines had already been submitted, thus, the data will be updated soon before the SAC meeting.)
- iii. No comment was given in this item.

12. The countries, which have not submitted their monitoring data 2021 or which have the necessity of data modifications, were requested that the data be submitted to the Data Management Department as early as possible.

13. The draft Data Report 2021 will be submitted to the Scientific Advisory Committee for adoption at its Twenty-second Session (SAC22).

VII. Evaluation for the Results of the Inter-laboratory Comparison (ILC) Projects 2021 (Agenda 6)

14. The NC presented the preliminary draft Report on the Inter-laboratory Comparison Projects in 2021 for wet deposition, dry deposition (filter pack method), soil and inland aquatic environment (EANET/STM 23/6). The participating countries were requested to submit the results of the Inter-laboratory Comparison (ILC) Projects by the deadline, the end of February every year. Also, the participating countries which have not submitted the 2021 ILC data were requested to submit the data as soon as possible, so as to complete the ILC Project Report 2021 for adoption at SAC22. The meeting was invited to discuss and provide comments.

15. Major discussion on this agenda included the following:

(Wet deposition)

- i. The NC requested that the participating countries re-analyze and submit their results of the artificial rainwaters. The technical guidance was provided from the NC.
- ii. The NC requested Cambodia, Indonesia, Lao P.D.R and Malaysia to answer the number of necessary samples for the ILC 2022. Based on the request from the participating counties, the NC will ship the samples in the middle of October.
- iii. It was confirmed that the ILC sample temperature in transportation to all participating countries should be kept below 20 °C, however, it was reported that sometimes these samples arrived over 28 °C condition. The NC answered that wet-deposition ILC samples are concentrated ones and relatively stable, thus, they were unaffected by that degree of temperature.

(Dry deposition)

- i. The NC distributed ILC 2021 samples to 23 laboratories, and received their results from 19 laboratories. In the results, Mongolia submitted anion results only due to some malfunction issues for cation analysis.
- ii. The NC plans to ship ILC-2022 samples to laboratories around the second week of October, and always encourages them to analyze before December 31.
- iii. The NC suggested one thing that the participating laboratories request one more set of the ILC-2022 dry samples to improve their analytical skill, and requested that they should consult with the NC before the due date, Feb. 28 if they have troubles or issues.
- iv. No comment was given in this item.

(Soil)

- i. In 23rd ILC Project on soil, 14 laboratories from 7 countries participated.
- ii. There were both random and systematic errors for factors of variabilities in measurements.
- iii. Ratio of outliers was higher than usual.
- iv. The NC asked some specific question to some laboratories, and recommended that analyst recheck the error of the calibration and the data handling such as copy and paste to prevent the

extremely-large variation of Ex-base cations shown in the ILC 2021.

- v. No comment was given in this item.

(Inland Aquatic Environment)

- i. 23 laboratories participated in this project, and 19 laboratories submitted their analytical data.
- ii. The NC pointed out that the flagged data percentage of all the reported data was lower than the last attempt.
- iii. The NC recommended that analysts pay more attention to NH_4^+ analysis such as the possibility of contamination in the laboratory, the calibration curve by using the appropriate concentrations of the standard solutions, and the separation of NH_4^+ and Na^+ in ion chromatography.
- iv. No comment was given in this item.

- 16. For the countries which have not submitted the ILC 2021 to the NC or have the necessity of data modifications, it was requested that the data be submitted to the Data Management Department of the NC as early as possible.

VIII. Consideration of the National Monitoring Plans (NMPs), Current Monitoring Activities for the EANET and Overall Air Concentration Monitoring Status of the Participating Countries (Agenda 7)

- 17. Each representative of the participating countries made presentations on their NMPs and the current EANET activities, including monitoring capacities, technical problems, future plan and so on, for improvement of the EANET activities. The NC requested for the participating countries to submit the NMPs as early as possible. (EANET/STM 23/7).
- 18. The meeting was invited to review the above issues and to discuss with their experiences and knowledge to solve the problems for their future innovation.
- 19. Major discussion on this agenda included the following:
 - i. Cambodia
 - There was no change of the location and number of the EANET monitoring sites in Cambodia.
 - The current monitoring data of $\text{PM}_{2.5}$ and O_3 in Phnom Penh was reported.
 - It was informed that there were several challenges such as the lack of engineering to conduct the maintenance and calibration, limitation of the budget plan, limitation of the cooperation with sub-national level, and too old equipment to respond the sample analysis.
 - The technical and financial support from the EANET were requested.
 - It was clarified that the $\text{PM}_{2.5}$ data in 2022 were introduced in the presentation, while the data have not been compared with those in 2021, also.
 - It was informed that the $\text{PM}_{2.5}$ monitor is working without problems.

- The NC suggested that diurnal variations of O₃ concentration also be shown, and clarified that the air concentration monitoring is conducted by another organization.

ii. China

- There were 11 monitoring sites in 6 cities as the EANET monitoring sites, which was as same as the previous year.
- It was informed that the regular monitoring activities, and QA/QC activities such as ILC and technical mission were done in 2021.
- The current monitoring results such as EC, SO₄²⁻, NO₃⁻, SO₂, NO_x, and PM₁₀ and ILC results were reported.
- It was informed that an online meeting would be held in October to analyze the monitoring data and train sampling and analysis technicians.
- It was reported that the wet deposition samples in Lijiang would be sent to analyze them, because many of R1 and R2 results were regarded as outliers. As one of the problems on analysis, the laboratory equipment was old, so that their exchange or replacement of equipment was needed.
- In response to the presentation regarding that many ion balance results of Lijiang site were not appropriate or mostly out of their ranges, the NC shared the R1 and R2 graphs on screen, which were compiled by the NC, and the NC asked China to make sure if there were any differences between them.

iii. Indonesia

- The current monitoring results such as wet deposition and dry deposition of filter pack was reported.
- It was informed that the structure of the organization has been changed which caused the different policies, including the organization structure, future plan project, and financial support, and the directorate of air pollution control, MoEF conducted air quality monitoring in 50 monitoring sites.
- It was reported that the filter pack monitoring at Jakarta has been stopped since June 2022 due to the technical problem.
- It was announced that monitoring on inland aquatic environment, soil and vegetation would not be conducted in the near future. The NC suggested that re-surveys on inland water and soil chemical properties would be informative even after 5 or 10 years to know the recovery status from acidification.
- It was clarified that monitoring on wet and dry deposition at Serpong and Jakarta sites could be continued by EMC after the rearrangement of organizations.

iv. Japan

- The location and number of the EANET monitoring stations was not changed in 2021.
- The data validation procedure, the MOEJ and the EANET Website as the real time data disclosure system, and site audit were introduced as a part of QA/QC activities.
- The current monitoring results of wet and dry deposition, soil and vegetation, inland, and

catchment were introduced.

- No comment was given in this item.

v. Lao PDR

- It was reported that there were 1 site for wet and dry deposition monitoring and 1 site for the inland aquatic monitoring. There was no change of the location and monitoring items.
- It was informed that the stationary air quality monitoring mainly PM_{2.5} was conducted in 8 monitoring sites including 1 EANET monitoring site. The mobile monitoring station and intensive monitoring were also utilized.
- It was reported that the training to staffs in NRESRI and province would be enhanced and the existing air quality monitoring station would be upgraded by installing additional equipment such as NO_x, SO_x, O₃ and CO.
- It was confirmed that the monitoring items was limited as PM_{2.5} mass concentration. The manual method of PM_{2.5} mass concentration was shared.
- Consumables for PM_{2.5} monitoring, mainly their filters, are needed for continuous monitoring. In response to the presentation, the NC shared an agent in Vietnam, which handles some consumables of DKK-TOA, with LAO PDR via email.

vi. Malaysia

- The wet and dry deposition monitoring were conducted, and inland aquatic monitoring in Kuala Tahan site was still under the administrative proceed at ministry level, and would start in mid-2022.
- It was informed that there were many challenges for wet and dry deposition, such as technical problems with certain instruments, postage problems with local logistic provider including late delivery and sample missing, and lack of staff are cited currently. Also, as challenges for inland aquatic environment, technical problems with on-site instruments were found out.
- There was a plan to expand the monitoring sites for dry deposition using filter pack method. Kapit and Kuching would be registered as dry deposition monitoring sites. It was reported that the inland aquatic monitoring sites would be expanded.
- The NC requested to show the information of new dry deposition monitoring site.
- It was clarified that the Kapit station will be the rural station.
- Because Indonesia's capital will be moved to Kalimantan, it was suggested that the new Kapit station would be useful to investigate future changes in air quality in the area.

vii. Mongolia

- The wet deposition monitoring was conducted from May to October because of the problem on the meteorological condition.
- Anion data were lacking because of IC problems.
- It was reported that the water distillation system had been broken since last year. The NC suggested any possibilities, such as receiving pure water from the National University of

Mongolia, or purchasing “ready-made” pure water from suppliers, however, Mongolia did not trust its quality, and added that the issue would be resolved if the water generator was repaired. Their collected samples are stored in refrigerator until fixation of the problem.

- The data on cations in wet deposition are quite different from those in previous years, in particular, Na^+ concentration in Terej was significantly high, although Mongolia is far from sea. It was suggested that Mongolia to confirm the data carefully.
- The NC requested to show the anion concentration and R1, R2 for checking error on Na^+ concentration in remote site. However, it is difficult to show due to the IC problem.

viii. Myanmar

- The monitoring of wet and dry deposition using filter pack method, and $\text{PM}_{2.5}$ was conducted in Yangon Kaba-Aye monitoring site. The support on extended monitoring network was requested.
- Myanmar conducted the regular monitoring and QA/QC activities, current pH, EC and ion concentration in 2021, and found out the extremely high concentration of nitrate and ammonium in mid of 2021, however the re-analysis had not been conducted due to the lack of the necessary reagent.
- There were many challenges such as the electricity shortage, old equipment, and lack of the spare parts in the market.
- It is very important for Myanmar to strengthen monitoring activities.
- The NC asked Myanmar if $\text{PM}_{2.5}$ monitoring at Mandalay should be excluded from their national monitoring plan because $\text{PM}_{2.5}$ monitoring at Mandalay has been stopped now.
- The NH_4^+ concentration was the ion concentration in particle. NH_4^+ concentrations in March and April are very high. However, any reasons have not been clarified.

ix. Philippines

- There were 3 wet/dry deposition monitoring sites, 2 inland aquatic monitoring sites, 2 soil and vegetation monitoring sites, and 1 catchment monitoring site, which were kept as same as the previous year.
- The capacity development for new staff will be conducted and lake profile will be uploaded and nationwide awareness will be hold.
- The NC clarified that the catchment scale monitoring data in La Mesa Watershed would be included in the Data Report 2021 to be submitted to SAC22.
- The runoff rate data is necessary to analyze the stream water chemistry in the catchment-scale monitoring. Cooperation with relevant experts in UPLB will be helpful for this purpose. It was clarified that cooperation with UPLB scientists would be reactivated after COVID-19.
- Linear regression analysis was used to interpret the annual datasets of rainwater, stream water, and lake water. It was suggested that the data in same month/season be compared to those in previous years taking account of their seasonality.
- $\text{PM}_{2.5}$ monitoring at Mt. St Tomas site has been conducting since the relocation. The NC mentioned that the $\text{PM}_{2.5}$ concentration was not high due to the remote site, which means their

data would be useful to observe the long-range transport, so the NC added its importance to keep monitoring. The NC requested sharing the ppt of final version files after the STM meeting.

x. Republic of Korea

- There were 3 EANET monitoring sites which have kept as same as the previous year.
- There were 52 wet deposition monitoring sites, 555 dry deposition monitoring sites in the whole nation, and 3 dry deposition sites would increase in 2023.
- No comment was given in this item.

xi. Russia

- There were 4 EANET monitoring sites which have kept as same as the previous year. There are two laboratories for EANET monitoring. For the future EANET program, Russia asked for any financial supports.
- The NC requested to provide the ppt of final version files after the STM meeting
- Dry deposition flux was calculated for nitrogen and phosphorous by the Russian National Center. The NC suggested discussing the results and recommended adding to the Data Report, thus, the NC proposed to check their calculation method of dry deposition flux.

xii. Thailand

- There was 3 EANET monitoring sites for wet deposition, dry deposition, soil and vegetation and inland aquatic monitoring.
- A wet only sampler in PCD was exchanged to new one in 2021.
- There were 137 monitoring sites in Thailand. In addition to the national monitoring station, there were many air quality monitoring sites in the private sector, big industry etc. The total number of air quality monitoring sites would be more than 200.
- The air quality monitoring station will be expanded in the near future. In 2023, there would be 96 monitoring sites in 65 provinces (increasing 19 monitoring sites compared with that in 2021).
- It was clarified that the permanent station is located in Kanchanaburi city, which was once registered. The PCD reported that the wet and dry deposition monitoring was conducted using a mobile unit in Vajiralongkorn Dam.
- The NC requested the monitoring data in Kanchanaburi, again, to compare with the data in the last years.

xiii. Vietnam

- There were 3 urban, 3 rural, and 1 remote monitoring sites, which was kept as same as in the previous year.
- The regular monitoring data of wet and dry deposition and PM_{2.5} was reported.
- Regular monitoring of the EANET and QA/QC activities will be continued, and challenges were equipment needs to be regularly maintained or replaced.
- Monitoring of ozone and PM_{2.5} will be promoted including the research cooperation, and

workshop for raising public awareness on air pollution, acid deposition and their impact will be organized.

- The trend of acidity was decreasing at Da Nang, because Da Nang city has been developing, so, it would affect the acidity.

xiv. Summary of the National Monitoring Plans in the Participating Countries

- The NC explained their background, objective and procedures for preparing and reviewing the NMPs by the participating countries every year, and deadline of the submission which is usually the end of June, every year. The NC requested that all participating countries implement their EANET monitoring activities in accordance with their own NMPs.
- The NC reminded all participants to submit the modified plan as soon as possible, if there is anything they have, and added that other countries, or other important information should be shared with them.
- In the NMPs 2022, it is expected that Wet Deposition, Dry deposition, Inland aquatic environment, and Catchment scale monitoring will be performed at 59, 47, 17, and 2 sites, respectively.
- NC requested each national QA/QC manager to check the Attachment 1 (List of sites and monitoring items) and Attachment 2 (Maps and number of monitoring sites), and then report to the NC if one finds errors and necessary modifications.

IX. Progress on the Revision of the Technical Manuals for Dry Deposition Flux Estimation and Air Concentration Monitoring (Agenda 8)

20. The NC presented the results of the 2nd meeting of the Expert Group on Revision of the Technical Manual for Dry Deposition Flux Estimation in East Asia and Technical Manual for Air Concentration Monitoring in East Asia (EANET/STM23/8). Following the updated strategy paper, the NC started that the technical manuals for the dry deposition flux estimation and air concentration manuals should be revised and updated, also informed that the EG meeting had been hold and discussed the contents in 2021. The NC informed that the two more meetings will be held for finalizing the technical manuals in 2022.

21. Major discussion on this agenda included the following:

- No comment was given in this item.

X. Other issues (Agenda 9)

22. The NC announced the individual training starts from the 1st to 3rd week of November online, so invitation letters will be sent soon. If anyone wants to apply to the training, apply to the NC with related documents by October 11.

- 23 The NC informed that the webinar of “the relationship between atmospheric environment and human health and ecosystems” on October 31, and “the emission inventory workshop on open biomass Burning” on December 5th, and “the capacity building for policy making of air pollution due to car traffic” on the undecided date of 2022. Further information will be announced in the EANET website.

XI. Closing of the Meeting (Agenda10)

24 On behalf of the NC, Dr. Meng Fan, Deputy Director General, ACAP, delivered the Closing Remarks. He expressed for his great appreciation to the participating countries and all EANET colleagues for their continuous efforts and contribution to improve the EANET data quality, although maintaining a high level of monitoring data quality is challenging under the limitation of technology and instrument. He appreciated that the important technical issues of monitoring and QA/QC had been highlighted and discussed among more than 50 experts and participants from the participating countries. The results of STM23 will be considered further on SAC22 and provided as an essential background document to SAC22 and IG24. He expected that the EANET activities of monitoring, research projects and capacities building will be expanded and strengthened through the expansion of the scope of the EANET.

- 25 The Meeting was officially closed.

Participating CountriesCambodia

Dr. Monidarin CHOU
Deputy General Director, Environment Protection General Directorate,
Ministry of Environment

Ms. Serey Pagna THLORK
Deputy Director, Laboratory, General Directorate of Environmental
Protection, Ministry of Environment., Cambodia

China

Dr. Xiaofei WANG
Senior Engineer, Ambient Air Quality Monitoring Department,
National Environmental Monitoring Centre (CNEMC)

Indonesia

Ms. Nevy Rinda NUGRAINI
Expert For Environmental Impact Control, Directorate of Air Pollution
Control - MOEF

Dr. I Wayan Susi DHARMAWAN
Researcher for vegetation monitoring, Research Center for Ecology
and Ethnobiology, National Research and Innovation Agency (BRIN)

Ms. Indrawati ASRI
Researcher, National Research and Innovation Agency (BRIN)

Mr. Eka SUHARGUNIYAWAN
Researcher, Center of Climate Change Information – Climatology
Department, Meteorology, Climatology, and Geophysics Agency
Republic of Indonesia

Lao PDR

Mr. Vanhna PHANPHONGSA
Deputy Director of Environmental Laboratory (EL) , Natural
Resources and Environment and Statistic Research Institute (NRESRI),
Ministry of Natural Resources and Environment (MoNRE) Lao
P.D.R

Malaysia

Mr. Mohan Kumar SAMMATHURIA
Senior Assistant Director, Atmospheric Science and Cloud Seeding
Division, Malaysian Meteorological Department

Mr. Haliza HASAN
Scientific officer, Environmental Quality Division, Dept. of Chemistry
Malaysia
Jalan Sultan, 46667 Petaling Jaya, Selangor, Malaysia

Mongolia

Ms. Altantuya BOLD
Chemist engineer, Central Laboratory of Environment and Metrology,
Mongolia

Myanmar

Ms. Wittyi SOE
remote sensing and GIS and Water Quality and Environment Quality,
Hydrological Division, Deprt. of Meteorology and Hyfrology

Ms. Wai Lwin Than THANI
Staff Officer, Hydrological Division, Department of Meteorological and
Hydrology, Myanmar

Philippines

Ms. Sammy AYTONA
Senior Science Research Specialist , Environmental Laboratory
Services Section - Environmental Research and Laboratory Services
Division (ELSS-ERLSD), Environmental Management Bureau
(EMB)/Department of Environment and Natural Resources Philippines

Republic of Korea

Dr. Jinsoo CHOI
Researcher, Air Quality Research Division/Climate and Air Quality
Research Department/National Institute of Environmental Research

Ms. Minyoung SUNG
Researcher, Air Quality Research Division/Climate and Air Quality
Research Department/National Institute of Environmental Research

Ms. Soyoung JUNG
Researcher, Air Quality Research Division/Climate and Air Quality
Research Department/National Institute of Environmental Research

Russia

Ms. Irina TOMBERG
Chief researcher, Laboratory of Hydrochemistry and Atmosphere
Chemistry, Limnological Institute, Siberian Branch of the Russian
Academy of Sciences (SB RAS), Irkutsk, Russia

Dr. Ekaterina ZHIGACHEVA
Junior Researcher, Institute of Global Climate and Ecology (IGCE)

Dr. Sergey A. Gromov
Deputy Director, Institute of Global Climate and Ecology (IGCE),
Roshydromet

Thailand

Mr. S Pichaid ATIPAKYA
Environmental, Pollution Control Department, Ministry of Natural
Resources and Environment, Thailand

Vietnam

Dr. Van Hong NGUYEN
Deputy Director, Sub-Institute of Hydrometeorology and Climate
Change/Vietnam national Institute of Meteorology, Hydrology and
Climate Change(IMHEN)

Ms. Nguyen Thi Kim Anh
Researcher, Center of Environmental Research, Vietnam Institute of
Meteorology, Hydrology and Climate change.

The Secretariats

Mr. Bert Fabian
Coordinator, SECRETARIAT FOR THE EANET
United Nations Environment Programme

Secretariat for STM23

Network Center for EANET

Asia Center for Air Pollution Research (ACAP)
1182 Sowa, Nishi-ku, Niigata-shi 950-2144, Japan

Dr. Shiro HATAKEYAMA
Director General

Dr. Meng FAN
Deputy Director General

Mr. Kenichiro FUKUNAGA
Deputy Director General

Dr. Tsuyoshi OHIZUMI
Head, Data Management Department

Dr. Ken YAMASHITA
Head, Planning and Training Department

Dr. Hiroyuki SASE
Head, Ecological Impact Research Department

Dr. Keiichi SATO
Head, Atmospheric Research Department
Data Management Department

Dr. Akie YUBA
Researcher, Atmospheric Research Department

Dr. Junichi KUROKAWA
Chief Senior Researcher, Data Management Department

Mr. Hiroyuki SASAKI
Researcher, Data Management Department

Ms. Kumiko NAKAMURA
Engineer, Data Management Department

Dr. Rieko URAKAWA
Senior Researcher, Ecological Impact Research Department

Mr. Hiroki YOTSUYANAGI
Senior Researcher, Ecological Impact Research Department

Mr. Masayuki MOROHASHI
Researcher, Ecological Impact Research Department

Ms. Ayako AOYAGI
Officer, Planning and Training Department