

The Eighth Senior Technical Managers' Meeting  
of the Acid Deposition Monitoring Network  
in East Asia  
1-3 August 2007, Bogor, Indonesia

## Overview of Past, Ongoing and Future Research Activities

Network Center for EANET

NC has implemented research activities in the cooperation with the organizations in participating countries of EANET and independently. Past and ongoing major activities are introduced in the followings.

- Joint research project with Mongolia on plant sensitivity

NC and Central Laboratory of Environmental Monitoring (CLEM), Mongolia, continue passive sampling of O<sub>3</sub> and SO<sub>2</sub> and measurement of tree growth in the Bogdkhan Mountain, where tree decline is reported. Two scientific papers were published in the international journal of plant science, *Phyton*, Austria, in 2005, based on the joint research project on plant sensitivity in Mongolia. Those data and their analytical results will be informative for discussion on acid deposition impacts on forest ecosystems.

- Joint research project with Republic of Korea on dry deposition (aerosol concentration) monitoring methodology

In the discussion at SAC4 for the improvement of dry deposition monitoring methodologies, it was suggested that a study on PM<sub>10</sub>, PM<sub>2.5</sub> and their components in special sites should be considered. In line with the suggestion of SAC4, the project on aerosol monitoring was planned as a joint research between National Institute of Environmental Research (NIER), Ministry of the Environment, Republic of Korea and NC. A workshop to discuss the results was held in February 2006 in Republic of Korea. In order to evaluate aerosol sampling methodology and PM<sub>2.5</sub> behavior in Japan and Republic of Korea, intensive monitoring was conducted on 12-27 October 2006 and 16-31 May 2007. The results have been summarized each other and the results and future plan will be discussed in a small workshop held in NC technical mission to Korea.

- Joint research project with Russia on evaluation of East Siberian atmospheric environment

NC has implemented the joint research project Phase III with the Limnological Institute, Russian Academy of Science, Siberian Branch (RAS/SB) in cooperation with National Institute for Environmental Studies, Japan. Annual acid deposition as well as heavy metals (mercury and lead)

and lead isotope ratio in rain and snow have been determined at four sites in East Siberia and Primorsky Region in Russia. The monitoring data are expected to be important for evaluation of long-range transportation of air pollutants from Europe and industrial regions of Russia to East Asia. The methodologies on data analysis used in the project are expected to be useful for evaluation of EANET monitoring data.

➤ Joint research project with Thailand on dry deposition flux

In order to investigate the deposition velocities above specific surfaces in East Asia, NC had been promoting a joint research project on dry deposition flux with Pollution Control Department (PCD), Thailand. A flux observation system using micrometeorological techniques was established in a teak forest located in Mae Moh, Lampang Province, Thailand, and the observation was started in late 2001. Since the available data for more than four years were accumulated, both organizations decided to finish the project in December 2005. Data evaluation was delivered in two papers by Japanese experts (Asian Center for Environmental Research, Meisei University, Japan).

➤ Joint research project with Thailand on dry deposition (gas concentration) monitoring

Following the termination of the Joint Research on dry deposition flux (Phase I) from January 2000 to December 2005, NC and PCD agreed to establish Phase II of the Joint Research Project focusing on QA/QC of gas concentration monitoring method in tropical region in August 2005. The difference of gas concentrations among some different types of monitoring methods (automatic monitor, filter-pack method, and passive sampling method) in Bangkok EANET site will be evaluated through the joint research between both organizations in cooperation with Asian Center for Environmental Research, Meisei University, Japan. The observation was started in December 2006.

➤ Joint research project with Thailand on catchment analysis

NC started the joint research project on catchment analysis in Thailand in 2005 with Royal Forest Department (RFD) and Environmental Research and Training Center (ERTC) in cooperation with Kyoto University (Japan) as a part of the Global Environment Research Fund (C-052: Project Leader, Dr. Junko Shindo, NIAES), the Ministry of the Environment of Japan. Monitoring on input (deposition) and output (stream water) fluxes in/from a small catchment area, and analyses on other biogeochemical aspects have been carried out continuously, and nutrient dynamics related to acid deposition in the area would be discussed. The project will be informative for the future catchment monitoring as one of activities in line with the Strategy Paper for Future Direction of

## Soil and Vegetation Monitoring of EANET.

### ➤ EANET research fellowship using the saving of the Secretariat

In 2005, two researchers of China and Philippines were invited on fellowship research in NC. Chinese researcher (WANG E-YI, China National Environmental Monitoring Center) studied on the theme entitled “Assessment of ozone variability in East Asia during recent years”. The variability of ozone concentration observed at sixteen sites in East Asia during recent years (from 2000 to 2004) was analyzed by using EANET monitoring data

The researcher from the Philippines (ARCELY C. VIERNES, Environmental Management Bureau, Department of Environment and Natural Resources) investigated on the theme entitled “Determination of unanalyzed components in rainwater”. In order to obtain good quality data on wet deposition monitoring, unanalyzed components on routine analysis, hydrogen carbonate ( $\text{HCO}_3^-$ ), fluoride ( $\text{F}^-$ ), bromide ( $\text{Br}^-$ ), nitrite ( $\text{NO}_2^-$ ), phosphate ( $\text{PO}_4^{3-}$ ), hydrogen phosphate ( $\text{H}_2\text{PO}_4^-$ ), formate ( $\text{HCOO}^-$ ) and acetate ( $\text{CH}_3\text{COO}^-$ ) were determined in addition to the ten major parameters in rainwater samples collected at EANET wet deposition monitoring sites in the Philippines.

In 2006, two fellowship researchers of Mongolia and Russia were invited in NC. The researcher from Mongolia (Bulgan TUMENDEMBERAL, Central Laboratory of Environment and Meteorology) investigated on the theme entitled “Determination of unanalyzed components in rain water”. Unanalyzed components in rainwater samples collected in Mongolia were determined as well as Ms. Viernes research in the previous year.

The researcher from Russia (Elena GRITSAN, Division of Meteorology and Climatology, Geographical Department, Moscow State University) studied on the theme entitled “Application of scientific climatological approach and statistical methods for optimization of EANET network”. In order to determine the areas for disposition “optimal” EANET network’s station, the precipitation chemistry ( $\text{nss-SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ ,  $\text{nss-Ca}^{2+}$ ,  $\text{H}^+$ ) data obtained for 2000-2005 were calculated by using the statistical method.

In 2007, NC sent an announcement of the fellowship to the National Focal Points (NFPs), SAC members of participating countries on 19 June 2007. Based on evaluation of expenses for fellowship within allocated budget, NC will support the study of two researchers from participating countries in the Acid Deposition and Oxidant Research Center (ADORC). The application forms of candidates are expected to be received through the National Focal Points of EANET of their countries by Monday, August 6, 2007 (Attachment 1 and 2).

➤ Other research activities (Independent and multilateral research activities)

Catchment analysis is one of the issues described in the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET. For obtaining basic data on this issue, research activities are implemented in a small catchment area in Shibata City, Niigata Prefecture, Japan. The data will be informative for development of guidelines or manual on catchment monitoring as well as implementation of the joint research project on catchment analysis with Thailand.

In order to investigate the differences among the long-range transport models developed for East Asian region, NC has been collaborating with the Model Inter-Comparison Study in Asia (MICS-Asia) Phase II. The Ninth Workshop on the Transport of Air Pollution in Asia was held at the International Institute for Applied Systems Analysis (IIASA), Austria on 27-28 February 2007, financially supported by ADORC. The latest information and current studies progress on the model simulation and emission inventories were presented by each participant. It was decided at the Workshop that 8 scientific papers would be prepared under the cooperation with MICS participants and would be submitted to the scientific journal, "Atmospheric Environment". Moreover, it was agreed among participants to implement the interpolation of studies in Phase 2 and further investigation for the improvement of model performance on individual basis. The results and information will be exchanged in the workshop from now on. Also the possibility of the collaboration with the Task Force on Hemispheric Transport of Air Pollution (TFHTAP: <http://aqm.jrc.it/HTAP/>) and WMO GAW Urban Research Meteorology and Environment (GURME: <http://www.wmo.ch/web/arep/gaw/urban.html>) will be investigated at the next workshop.

➤ New catchment study in tropical rain forests in cooperation with the OP3 Project in Malaysia

Promotion of the catchment study is one of the important issues for the ecological monitoring of EANET and requires the collection of a unique dataset from a forest environment in cooperation with local scientists. It was pointed out at the 6<sup>th</sup> Session of the Scientific Advisory Committee that catchment studies should be extended to other tropical regions for the future EANET monitoring.

The OP3 Project (Oxidant and Particle Photochemical Processes above a South-East Asian tropical rain forest) is a three-year scientific research project conducted by eight groups from UK universities, Malaysian institutions (including the Malaysian Meteorological Department) and a combined group from USA. The project will be based in the Danum Valley in Sabah, Malaysia which is also one of the EANET monitoring sites. A BAe 146 research aircraft will be deployed for 3 weeks in Malaysia during the intensive measurement periods: 31 March-4 May 2008 and 23 June-27 July 2008. The overall goal of the project is to lead to a better understanding of the interactions that exist between natural forests and the Earth's climate system.

ADORC discussed the possibility of collaboration with scientists of Lancaster University, who were leading the sub-project, "Forest fluxes and atmospheric chemistry" in the Project. Based on preliminary discussions with the UK researchers and Malaysian colleagues, several scientists of ADORC will start the activity on "Atmospheric deposition impacts on soil and stream hydrochemistry" under this sub-project. Experience in Thailand can be utilized for this work. ADORC's involvement in the other sub-projects which focuses on regional air quality and climate change may be considered. ADORC is now trying to obtain research grants for this new activity. The outputs will be informative for future activities of EANET, especially for the catchment-scale monitoring/modeling and also the regional ozone issue.

Attachment 1

## Application for Research Fellowship of the Network Center in 2007

1. Name	(Family)	(First)	(Middle)		
2. Nationality					
3. Date of birth	(Day)	(Month)	(Year)	4. Sex	Male Female
	/	/			
5. Position					
6. Div./Dept.					
7. Organization					
8. Academic Background: Higher education (university and above; start from the latest one)					
Name of University/ Institution	Location	Degree	Field of specialization	Date of Graduation (Month, Year)	
9. Scientific and research interests					
10. Previous employment (start from the latest one)					
Name of institution	Location	Position	From-To		
11. Major publications of last 5 years (up to 10, starting with those for which you are the first/correspondent author)					

Authors (all), Title, Journal, Vol., No, pp-, Month, Year

12. Research plan of fellowship in NC (ADORC, Japan)

(1) Title of research

(2) Objective of proposed research

(3) Proposed work plan at NC (ADORC)

(4) Expected results and benefits

(5) Duration(maximum two months)

13. Mailing address and contacts

(1) Office

Tel:

Fax:

e-mail:

(2) Home

Tel:

Fax:

e-mail:

## **Research Fellowships at the Network Center in 2007**

### **OUTLINE**

1. The Sixth Session of the Intergovernmental Meeting (IG6) in Cambodia, November 2004 agreed that research fellowship should be established in the Network Center (NC) with the budget allocated in accordance with EANET/IG 6/9(rev2)- “Proposal on the Possible Use of the Previous Savings of the Secretariat” during 2005-2006.
2. The Guidelines for Research Fellowship are presented in Annex 1. The Guidelines were endorsed at the Seventh Session of the Intergovernmental Meeting (IG7), November 2005 in Niigata, Japan and the first batch of research fellows was selected in 2005.
3. NC had prepared the list of candidate research themes for studies to be carried out in 2005-2006 in line with “Tentative Design of the EANET” (EANET/IG 2/5/3) and other EANET documents. This list was circulated at the Fifth Session of the Scientific Advisory Committee (SAC) in September 2005 and has been applied in 2006, and will still be applied in 2007 (Annex 2).
4. Based on evaluation of expenses for research fellowships, it was decided that NC will support the attachment of two researchers from participating countries to the Acid Deposition and Oxidant Research Center (ADORC) in 2007.
5. The application forms of candidates should be submitted through the National Focal Points of EANET and should reach the NC by Monday, August 6, 2007.
6. NC will inform the Scientific Advisory Committee and the Intergovernmental Meeting on the results of completed fellowships at their Sessions in 2007.



**Guidelines for Fellowship in the Network Center of EANET**  
(EANET/IG 7/4, Annex 6)

1. Fellowship for research studies in NC for EANET (NC) is established under the decision of Intergovernmental Meeting (IG). IG decides the appropriate sizes and sources for allocated budget.
2. The general directions and scope of researches are defined based on “Tentative Design of the EANET” (EANET/IG 2/5/3), Work program and Budget for EANET and other relevant documents adopted by IG and Scientific Advisory Committee (SAC).
3. NC sends an announcement of fellowship to National Focal Points (NFPs), SAC members of participation countries. The general conditions are explained in the announcement.
4. Scientists from the participating countries of EANET can apply for fellowship.
5. The applicant should send through NFPs the proposal on study with clear identification of theme and expected results of works. The duration of study could be agreed with NC within time limits of fellowship.
6. The decision on acceptance of proposal will be done by NC. The consideration could be completed within one month after closing date of receiving the proposals.
7. NC will make necessary arrangement and procedure for the fellows.
8. The results of studies should be prepared in the form of scientific reports or papers for journals.

## **Candidate Research Themes for Fellowship Studies in the Network Center of EANET in 2007**

### Analysis of samples

- Analysis of sulfur content and its isotope ratio in tree leaves near an emission source to estimate the impacts
- Preliminary observation of wet deposition in new participating countries
- Determination of unanalyzed components like  $\text{HCO}_3^-$  in rain water
- Isotopic determination for evaluating emission sources of air pollutants

### Evaluation of existing data

- Comparison of ratios of dry to total deposition of acidic compounds from various countries in EANET region
- Seasonal variation and climatic dependence of acidic compounds and their ratios in gas, aerosol and liquid phases from different climatic zones
- Estimation of air pollutant emissions of particular interest
- Comparison of air pollution and acid deposition between several mega-cities
- Characteristics of urban air pollution and acid deposition in tropical region
- Evaluation of optimal density of monitoring network sites for assessment of regional acid deposition and transboundary atmospheric transport
- Assessment of ozone and other gaseous concentrations in East Asia

In addition to the above, other themes which are in line with the Strategy on EANET Development (2006-2010) may be considered, subject to discussion with the Network Center (NC) and considering the capacity of NC.

*The Network Center  
For  
the Acid Deposition Monitoring Network in East Asia*

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ADORC-07-014

19 June 2007

**Announcement on Research Fellowship at the Network Center in 2007**

Dear National Focal Points and Scientific Advisory Committee members of EANET,  
(CC: Heads of National Centers of EANET)

As you are aware a Research Fellowship Program was established at the Network Center (NC) for EANET during 2005-2006 based on the decision of the Sixth Session of the Intergovernmental Meeting (IG6) in Cambodia, November 2004 using the budget allocated in accordance with the "Proposal on the Possible Use of the Previous Savings of the Secretariat (EANET/IG 6/9 rev2)". Based on the "Guidelines for Fellowship in the Network Center" endorsed at the Seventh Session of the Intergovernmental Meeting (IG7), NC and the Secretariat of EANET have started a new application procedure for the research fellowship since 2006.

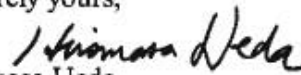
In this regard, I am pleased to announce that NC would like to offer research fellowships to two researchers from the participating countries of EANET for short-term (up to two months) attachment at NC in 2007. We wish to request National Focal Points (NFPs) to inform the scientists with relevant expertise and knowledge on acid deposition in your country of this opportunity and invite them to apply for the fellowship by completing the enclosed application form and submitting it to their respective NFPs. The NFPs of EANET are expected to forward the completed application form(s) to NC before Monday 6 August 2007. The attached documents are for your reference and necessary action.

If you have any questions on this matter, please contact the following staff of the Acid Deposition and Oxidant Research Center (ADORC):

Contact person:

Mr. Ryoichi SATO rsato@adorc.gr.jp/Mr. Ken YAMASHITA kyamashita@adorc.gr.jp

Sincerely yours,

  
Hiromasa Ueda  
Director General

1. Application form
2. Research fellowship at the Network Center in 2007