The Twenty-second Session of the Scientific Advisory Committee
on the Acid Deposition Monitoring Network in East Asia
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Annual report of the activities by Task Force on Soil and Vegetation Monitoring in 2021/2022

Chair of the Task Force
Secretariat of the Task Force

Ⅰ. Introduction

1. The Task Force on Soil and Vegetation Monitoring of the EANET and the Network Center for the EANET (NC) as the Secretariat of the Task Force have been making efforts to implement activities in line with the "***Strategy Paper for Future Direction of EANET on Monitoring of Effects on Agricultural Crops, Forest and Inland Water by Acidifying Species and Related Chemical Substances",*** which was updated and adopted by the Scientific Advisory Committee at its Twentieth Session (SAC20) in 2020.

2. The Task Force members and NC restarted the activities accordingly, although the EANET started discussion on reformation of the task forces with the scope expansion.

3. The Chair and Secretariat of the Task Force compiled progress of the respective activities and circulate among the members for their confirmation annually. In this document, we review major outputs from the activities implemented by the members and NC scientists in 2021/2022.

Ⅱ. Major outputs

4. In the updated Strategy Paper (EANET 2020), it was suggested that the activities be implemented taking into consideration the following subjects:
   - Recovery of ecosystems from acidification
   - Loads of atmospheric nitrogen to ecosystems and its cycle
   - Effects of ozone and PM on trees/crops

5. Major outputs from the respective activities can be summarized as follows:

   i. Accumulation of information on air pollution effects in forest area and agricultural field

   - Task Force members and the NC have been sharing the latest scientific information, such as new journal papers and scientific reports from other networks, by e-mail communications.

- Task Force members contributed to some of the following publications as (co-)authors.
  - *ICP Forests Technical Report Forest Condition in Europe - The 2021 Assessment*, by the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests), the United Nations Economic Commission for Europe (UNECE), http://icp-forests.net/page/icp-forests-technical-report?xg_source=msg_mes_network
  - Tanikawa T et al. 2022. Sulfur accumulation in soil in a forested watershed historically exposed to air pollution in central Japan. *Geoderma* 407, 115544. https://doi.org/10.1016/j.geoderma.2021.115544
  - Sase H et al. 2022. Nitrogen saturation of forested catchments in central Japan - Progress or recovery? *Soil Science and Plant Nutrition* 68:1, 5-14. https://doi.org/10.1080/00380768.2021.1991228
  - Feng Z et al. 2022. Ozone pollution threatens the production of major staple crops in East Asia. *Nature Food* 3, 47-56. https://doi.org/10.1038/s43016-021-00422-6
  - Kalugina OV et al. 2021. Changes in the fatty acid composition of pine needle lipids under the aluminum smelter emissions. *Ecotoxicology* 30, 2083–2095. https://doi.org/10.1007/s10646-021-02479-2
  - De Marco A et al. 2022. Strategic roadmap to assess forest vulnerability under air pollution and climate change. *Global Change Biology* 28, 5062-5085. https://doi.org/10.1111/gcb.16278
  - Akimoto H et al. 2022. Development of science and policy related to acid deposition in East Asia over 30 years. *Ambio* 51, 1800–1818. https://doi.org/10.1007/s13280-022-01702-6
  - Zhigacheva ES et al. 2022. Stream water acidification in the Far East of Russia under changing atmospheric deposition and precipitation patterns. *Limnology* https://doi.org/10.1007/s10201-022-00696-0
  - Xu M et al. 2022. Ammonia fluxes over an agricultural field in growing and fallow periods using relaxed eddy accumulation. *Atmospheric Environment*, 284, 119195. https://doi.org/10.1016/j.atmosenv.2022.119195
  - Mohad Isa MNA et al. 2022. Potential of urban forest trees as bioindicators for heavy metal elements in urban areas of Bintulu, Sarawak. *The Malaysian Forester* 85: 65-77. http://malaysianforester.my/forestry/archives_journal_volume.php?volume=85&nombor=1
  - Yamashita N et al. 2022. Assessing critical loads and exceedances for acidification

and eutrophication in the forests of East and Southeast Asia: a comparison with EANET monitoring data. *Science of the Total Environment* 851, 158054. http://dx.doi.org/10.1016/j.scitotenv.2022.158054

- Ding W et al. 2022. Tracing the source of nitrate in a forested stream showing elevated concentrations during storm events. *Biogeosciences*, 19, 3247–3261, https://doi.org/10.5194/bg-19-3247-2022.

ii. Promotion of catchment analysis

- The NC has been continuing field surveys at the Kajikawa catchment (KJK), Niigata, Japan, together with the data analysis of the Lake Ijira catchment (IJR), the regular monitoring site. Scientific outputs from the activities have been published in international journals:
  - Tanikawa T et al. 2022. *Geoderma*
  - Sase H et al. 2022. *Soil Science and Plan Nutrition*
  - Ding W et al. 2022. *Biogeosciences*
- A colleague from the Institute of Global Climate and Ecology (IGCE), Russia, has published a scientific paper on data assessment for the Komarovka River catchment, the regular monitoring site, as her Ph.D. Thesis study at Niigata University, Japan. The NC scientist supervised the Ph.D. study as the Visiting Professor of the university.
  - Zhigacheva ES et al. 2022. *Limnology*
- Additional scientific papers are being prepared by researchers of the NC in cooperation with external grant projects, such as the KAKENHI projects in Japan.
- The detailed progress of activities will be presented in a different agenda.

iii. Promotion of regional impact assessment

- NC scientists have been collaborating with a scientist from the Forestry and Forest Products Research Institute (FFPRI), Japan, to assess regional impact assessments of acidification and nitrogen saturation using the Critical Load Approach. The manuscript has just been published.
  - Yamashita N et al. 2022. *Science of the Total Environment*

Ⅲ. Actions required at the 22nd Session of SAC (SAC22)

6. SAC 22 is invited to review the outputs above.