Hub of Talents on Air Pollution and Climate

HTAPC Newsletter

Issue 15, April 2025

Highlights

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Image : GISTDA

Source : https://it24hrs.com/2024/gistda-nasa-fly-survey-air-quality-solve-pm2-5-thailand/

Accomplished Activities of Hub of Talents on Air Pollution and Climate (HTAPC)

Issue 15

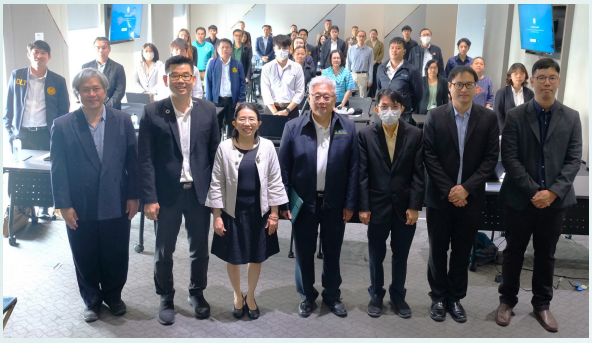
Consultation Meeting on the Presentation of Research Findings from the Project: "Research and Development of a Processing and Reporting System for Monitoring Open Burning Areas through the Application of High-Resolution Satellite Imagery for $PM_{2.5}$ Pollution Mitigation"



On April 29, 2025, the Hub of Talents on Air Pollution and Climate (HTAPC), under the National Research Council of Thailand (NRCT), Ministry of Higher Education, Science, Research and Innovation (MHESI), organized a consultation meeting to present the findings of the project titled **"Research and Development of a Processing and Reporting System for Monitoring Open Burning Areas through the Application of High-Resolution Satellite Imagery for $PM_{2.5}$ Pollution Mitigation."** The meeting was held at the boonnak meeting room, NRCT building 3, 1st floor, Bangkok.

This meeting underscored the importance of utilizing the research findings to address the critical issue of $PM_{2.5}$. HTAPC, as the convener, emphasized the strategic role of scientific evidence in informing mitigation measures. **Asst. Prof. Lt. Col. Dr. Soravis Supavetch**, Lecturer in the Department of Civil Engineering, Faculty of Engineering, Kasetsart University (Bangkhen Campus), served as the principal investigator of the project, which focused on the contribution of open burning to $PM_{2.5}$. To promote knowledge exchange and practical application, the organizers invited researchers undertaking similar initiatives, along with relevant stakeholders and end-users. These included **Asst. Prof. Dr. Sanphet Chunithipaisan** from the Faculty of Engineering, Chulalongkorn University, researchers from the Department of Agriculture, researchers from the Division of System Development and Plant Product Certification, and the Division of New Economic Crop Research and Greenhouse Gas Management for Agriculture, to present their research findings and participate in a discussion on the translation of research into practice.

Workshop on Technology and Innovation Transfer from the Project: "A Study on the Application of Technology and Innovation to Reduce Exhaust Emissions from Target Vehicle Groups"


On April 30, 2025, the Hub of Talents on Air Pollution and Climate (HTAPC), under the National Research Council of Thailand (NRCT), Ministry of Higher Education, Science, Research, and Innovation (MHESI), participated in a workshop for the transfer of technologies and innovations derived from the project: **"A Study on the Application of Technology and Innovation to Reduce Exhaust Emissions from Target Vehicle Groups."** The project is supported by P24 funding aimed at addressing urgent national challenges and crises, with financial support provided by NRCT. The event was held at The Quarter Ari by UHG, Bangkok. The primary objective was to reduce emissions from diesel vehicles such as pickup trucks and freight trucks through the deployment of advanced technologies and innovations.

The workshop was honored by the presence of **Dr. Nuwong Chollacoop**, director of the Low Carbon Energy Research Group at the National Energy Technology Center (ENTEC), representing the National Science and Technology Development Agency (NSTDA), who serves as the project leader. **Dr. Supat Wangwongwatana** delivered the opening remarks on behalf of the NRCT director. **Dr. Peerawat Saisirirat** then presented the background and significance of the project. Following the opening, **Asst. Prof. Dr. Mongkol Ekpanyapong** conducted a training session on the use of a computer vision-based system to measure vehicular smoke opacity. This remote sensing system is designed to screen high-emitting diesel vehicles and estimate $PM_{2.5}$ emissions based on measured smoke opacity levels. Subsequently, **Dr. Mati Horprathum** and **Dr. Rungroj Jintamethasawat** introduced a data processing, visualization, and management platform for screening and tracking target vehicle groups. They also demonstrated the use of a dashboard system designed to display real-time data on particulate emissions from the transportation sector and its application in supporting Low Emission Zone (LEZ) policies. In the final session of the workshop, the presenters summarized key points and addressed questions regarding the digital tools and systems developed to enhance vehicle emission control. Recommendations were provided for the practical application of these tools in designated pollution control zones.

HTAPC
Knowledge Dissemination

Issue
15

What NASA Try to Find with the Aircraft Campaign: (ASIA-AQ and How to Understand Thailand Air Quality) ?

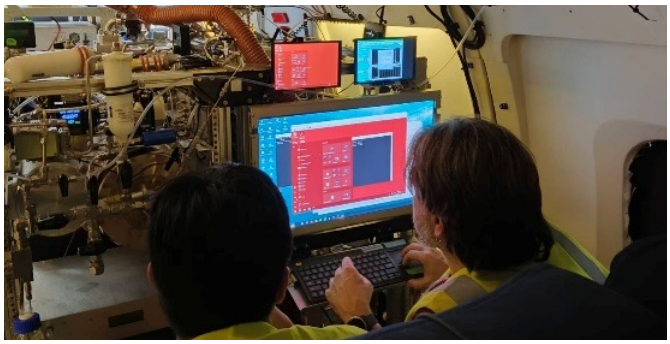


Figure 1 and 2 The Team of Thailand Atmospheric Scientists joined the study with the international team on board DC-8 at U-Tapao, Eastern Thailand

During March 15 – 25, 2024, NASA and the international team have conducted the field campaign of atmospheric scientific research in which the air over Thailand was sampled via 2 aircrafts, i.e. DC-8 (Figure 1 and 2) and G-III. Both the aircrafts have flown over South Korea, the Philippines and Taiwan for investigating and finding out about the composition in order to identify the sources and long-range transport of those aerosol and other pollutants in the air. For Thailand, such the kind of research has never happened before. This research campaign gains success through the leading effort of Geo-Informatic and Space Technology Development Agency, Ministry of Higher Education, Science, Research and Innovation. This campaign was conducted in collaboration with Thai scientists. The whole international team has developed the Rapid Science Synthesis Report (RSSR). This article reviews some parts of the RSSR.

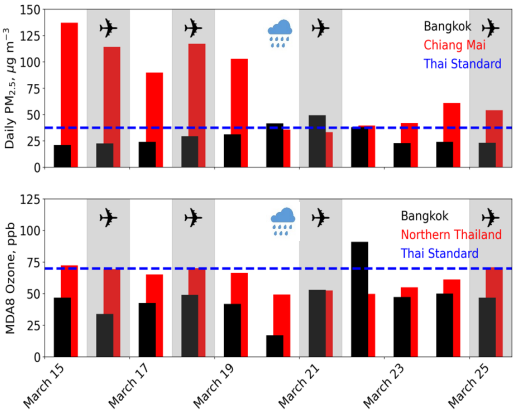


Figure 3 Daily $PM_{2.5}$ concentrations and eight-hourly average ozone measured above ground during NASA's week of flight.

Figure 3 shows the level of daily-average concentration of $PM_{2.5}$ (top) and 8-hourly averages of the ground-level Ozone (MDA8 O_3) (bottom) during the campaign over Thailand when the flight campaign was possible on only 4 days, i.e. March 16, 18, 22 and 25, 2024. The data indicates the concentration of $PM_{2.5}$ at the ground-level in Chiang mai (red bar) exceed the National Ambient Air Quality Standards on March 15, 17 and 19, 2025. While the concentrations were higher than in Bangkok indicates that the aircraft campaign has collected the data on the haze-episodic day and the rainy day when rain has washed down much of the air pollutants, resulting in the cleaner air in comparison to those during the previous 2 days.

For Ozone, the concentrations were fluctuated with concentrations higher in the northern region than in Bangkok, which exceeded the standard for air quality in Thailand. The highest values were seen on March 23, which was above the standard even in Bangkok. Analysis of $PM_{1.5}$ composition at 1 km altitude (Figure 4) over all areas revealed that organic compounds (green) were the main component, followed by sulfate (red), with little variation over the four sampling days. This study indicates that the main source of aerosols is biomass burning, especially in the northern region, which has higher aerosol concentrations than other areas during the study period. The detailed study results can be read further from the RSSR which is currently being published. Everyone can also follow more details from the online seminar organized by HTAPC in collaboration with GISTDA and the Breathe Cities project for Bangkok officials on May 14, 2025.

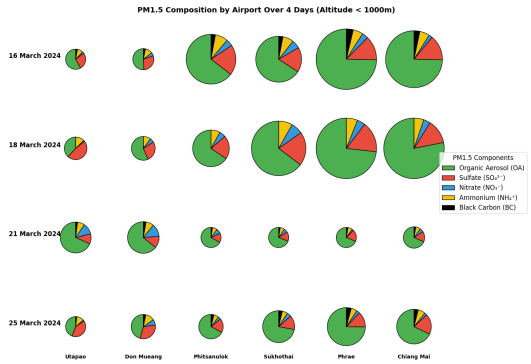


Figure 4 The proportion of $PM_{1.5}$ components collected from the air at a height of 1 km above the areas along the flight path, including U-Tapao, Don Mueang, Phitsanulok, Sukhothai, Phrae and Chiang Mai.

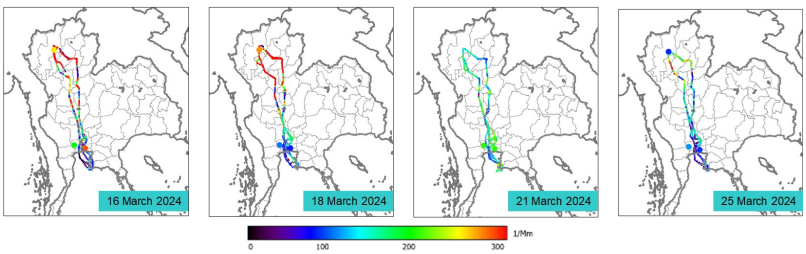


Figure 5 Extinction Coefficient of the aerosol at 532 nm along the flight path on the 4 days

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Hub of Talents on Air Pollution and Climate: HTAPC)

We cordially invite you to join us

Hub of Talents on Air Pollution and Climate

HTAPC Membership Form for Experts

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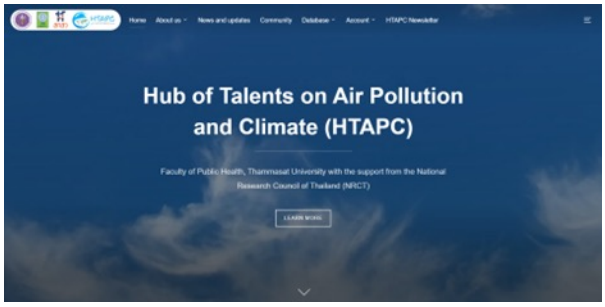
https://www.htapc.info



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Monthly Newsletter

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