Hub of Talents on Air Pollution and Climate

# HTAPC Newsletter

Issue 16, Jun 2025

## Highlights



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*Image: https://workpointtoday.com*
*Source: https://workpointtoday.com/fire-5/*

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

Issue 16

## Seminar What NASA and International Research Team Found from the Airborne and Satellite Investigation of Asian Air Quality (ASIA-AQ) campaign over Bangkok and How to Understand the Composition and Sources of Secondary Pollutants - Ozone and $PM_{2.5}$

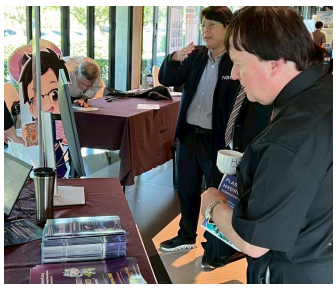


On May 14, 2025, the Hub of Talents on Air Pollution and Climate (HTAPC), under the National Research Council of Thailand (NRCT), Ministry of Higher Education, Science, Research and Innovation (MHESI), in collaboration with the Geo-Informatics and Space Technology Development Agency (GISTDA) and the Breathe Cities project, organized a training seminar titled **"Seminar What NASA and International Research Team Found from the Airborne and Satellite Investigation of Asian Air Quality (ASIA-AQ) campaign over Bangkok and How to Understand the Composition and Sources of Secondary Pollutants - Ozone and $PM_{2.5}$"** The seminar was held at the Kasatsuek 2 Room, 4th Floor, The Twin Towers Hotel, Bangkok.

The seminar was honored by the opening remarks from **Mr. Pornprom Vikitsreth**, Advisor to the Governor of Bangkok, and the keynote address by **Dr. Wiparat De-ong**, Executive Director of NRCT. The event brought together both domestic and international experts to share interdisciplinary knowledge, spanning from field data collection and scientific modeling to local-level planning and policy integration. Key highlights included presentations by **Dr. James Crawford** from NASA and **Prof. Junsu Gil** from Korea University, who shared insights from recent aerial survey missions over Bangkok conducted in collaboration with international research teams. Thai experts, including **Dr. Nantaporn Noosai** and **Assoc. Prof. Dr. Savitri Garivait**, provided contextual explanations on the mechanisms of secondary ozone and $PM_{2.5}$ formation in Bangkok. **Dr. Pakorn Petchprayoon** delivered a technical session on airborne monitoring and spatial management strategies. **Dr. Panwadee Suwattiga** and **Assoc. Prof. Dr. Nares Cheusuwan** presented chemical analysis of historical pollution monitoring data, while **Assoc. Prof. Dr. Surat Bualert** discussed vertical profiling of secondary $PM_{2.5}$ to support policy formulation. The event concluded with an in-depth panel discussion on the challenges and opportunities in air quality management in Bangkok, featuring **Dr. Chanika Sukwattanawijit** and **Dr. Wanisa Surapipit.** Finally, **Dr. Supat Wangwongwatana**, Director of HTAPC, wrapped up the session by summarizing the outcomes and gathering feedback from participants to inform the development of future air pollution initiatives. This seminar served as a vital platform for knowledge exchange and collaboration, aimed at advancing sustainable air quality management in Bangkok.

## Participation in the 24th National Environmental Conference and the 14th International Conference on Environmental Engineering, Science and Management





On May 20–21, 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 "the 24th National Environmental Conference and the 14th International Conference on Environmental Engineering, Science and Management"** held at Bangsaen Heritage Hotel, Chonburi Province.

At the event, **Dr. Wiparat De-ong**, Executive Director of the NRCT, assigned **Dr. Supat Wangwongwatana**, Director of the HTAPC, and **Ms. Kannika Durongkadech**, Director of the National Research and Innovation Mission for Natural Resources and Environment, to represent the NRCT and present research outcomes through an exhibition booth. A total of seven NRCT-supported research projects were showcased, emphasizing the advancement of knowledge and innovation in air pollution and environmental management. The exhibited projects included: Calibration of Low-Cost $PM_{2.5}$ Sensors Using Artificial Intelligence (Assoc. Prof. Dr. Thongchai Kanabkaew), Dust Emission Reduction from Diesel Engines Using Technological Innovations (Dr. Nuwong Chollacoop), Development of a Continuous Online Monitoring System for $PM_{10}$, $PM_{2.5}$, and $PM_{10}$ Emissions (Assoc. Prof. Dr. Panit Inta), Spatial Vulnerability Analysis to $PM_{2.5}$ Using Space Technology and Geoinformatics (Ms. Woranuch Chanson), Modeling and Mapping of Burned Areas through Wildfire Data and Web-Based Applications (Assoc. Prof. Dr. Sanphet Chunithipaisan), Monitoring Open Burning Areas Using High-Resolution Satellite Imagery (Asst. Prof. Lt. Col. Dr. Soravis Supavetch), and Reduction of Black Smoke and $PM_{2.5}$ from Diesel Engines Using Fuel Additives (Ms. Thitiporn Wattanakul). The participation not only served as a platform for public dissemination of research and innovation but also played a pivotal role in driving the development of practical knowledge and solutions for sustainable environmental management. These efforts are in alignment with national policies aimed at strengthening environmental systems and promoting public well-being, as well as fostering the practical application of research for tangible societal benefit.

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

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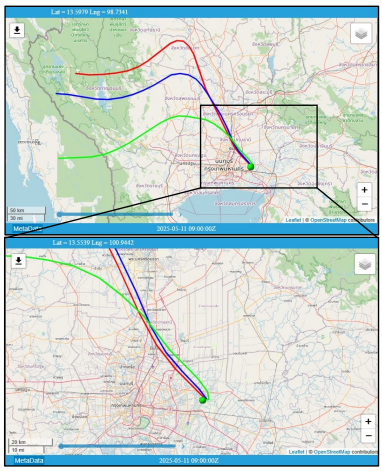
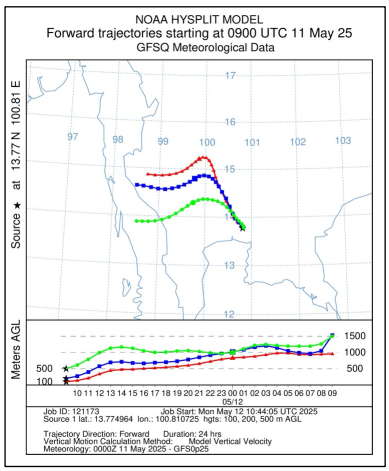
## Analysis of Air Mass Movement Using HYSPLIT Trajectory: The furniture warehouse fire in Lad Krabang

**On May 11, 2025, at approximately 4 p.m. local time, a fire broke out at a furniture factory located on Chalong Krung 55, Soi Lad Krabang 20. The incident resulted in the emission of a large smoke plume, which ascended into the lower to mid-level atmosphere. The HYSPLIT trajectory model was utilized to analyze the dispersion and movement patterns of the air masses associated with this event.**

## Analysis of Air Mass Movement Using HYSPLIT Trajectory

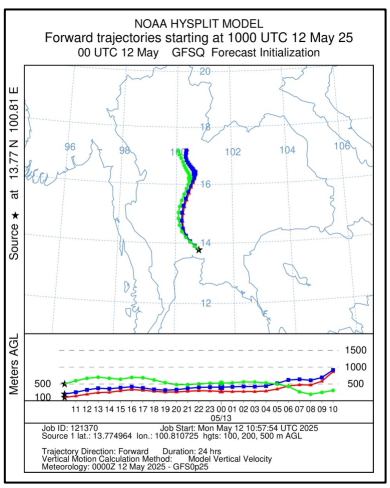


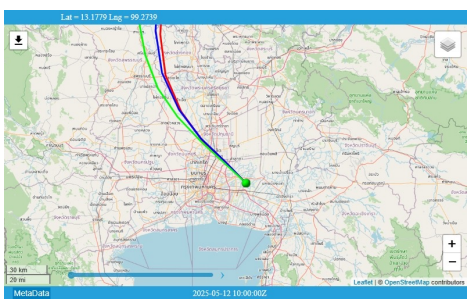


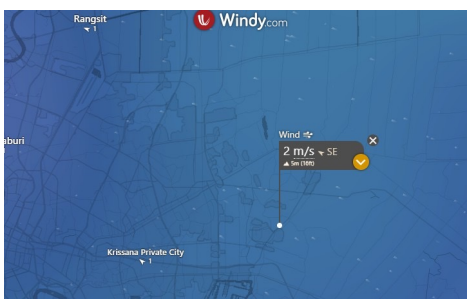

On May 11, 2025, at approximately 4 p.m. local time, the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model was utilized to simulate the forward trajectory of air mass movement following a fire incident. The source location was set at the fire origin, and the simulation projected the trajectory for a 24-hour period at three altitudinal levels above ground: 100 meters (green line), 200 meters (blue line), and 500 meters (red line). This modeling approach aimed to illustrate the direction of smoke plume transport and its potential impact on surrounding areas.

According to the simulation results (see attached figure), air parcels at altitudes between 100 and 500 meters are projected to move in a northwesterly direction. The projected trajectories of the smoke plume intersect several key urban districts, including Min Buri, Sai Mai, Lak Si, and Rangsit. Additionally, the model indicates that the smoke plume is expected to remain at a low to moderate altitude (below 1,500 meters) during the first 24 hours, suggesting a potential impact on air quality in areas along the projected path of dispersion.

Furthermore, forward trajectory simulations using the HYSPLIT model conducted on May 12, 2025, at approximately 6 p.m. local time, for air parcels at altitudes of 100, 200, and 500 meters above ground level, indicate that the air masses continued to move in a northwesterly direction—consistent with the results from the previous day (May 11, 2025). When compared with wind direction data from the Windy website, it was observed that the trajectories aligned with prevailing winds, which were blowing at an average speed of approximately 2 meters per second, as illustrated in the figure below.






**Recommendations:**

The information derived from the HYSPLIT model's air mass trajectory simulations can be effectively utilized to support emergency response operations. For example, the projected movement of the smoke plume can inform timely public warnings for communities located along the forecasted path. Additionally, it can aid in the development of evacuation plans, such as relocating affected populations to safer areas located upwind of the incident site.

HTAPC
Knowledge Dissemination
Issue 16

# Understanding Forest Burning Behavior and Psychological Impacts:

## A Case Study of National Park Communities

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[4] Faculty of Public Health, Thammasat University


The $PM_{2.5}$ problem is one that academics, civil society, and the private sector are focusing on, both in terms of studying the causes, health and economic consequences, and driving tangible solutions, particularly in the northern region, where the problem is caused by forest burning and agricultural waste. There were case studies suggesting some forest firers had a history of mental illness and drug misuse, and this group of persons has been termed the "men in black". In addition, the national park plans to prevent forest fires by hiring locals to work during the dry season to keep an eye out for fires and develop a feeling of community care. This also allows people to make money throughout the dry season, perhaps reducing the problem of fires and $PM_{2.5}$ pollution.

As a result, the Hub of Talents on Air Pollution and Climate launched a study to better understand the psychosocial dimensions of those who were employed and those who had committed forest fires in the area, as well as to provide information for planning long-term future assistance.

The researchers visited a community in a national park to interview 42 Participants, their families, and their supervisors during their work.

Participants are classified into two groups depending on their history of forest burning: 13 who have or were reported to have a history of forest burning, and 29 who do not. Both groups had similar basic demographic characteristics such as gender, age range, marital status, education, family residence, and physical illnesses. However, in terms of mental health issues or drug use, participants with a history of forest burning had more problems than the other group, at 46.2% (against 10.3% in the other group). Furthermore, in both groups, 83.3% had a history of alcohol consumption, 54.8% were at risk of alcohol-related issues, and 76.2% reported a history of smoking, with smoking addiction severity ranging from low to moderate. Furthermore, around 31.0% of individuals in both groups reported problems with drug use in the current and previous three months, with methamphetamine and cannabis use being particularly prevalent.

Regarding psychosocial problems and the effects of $PM_{2.5}$ pollution, the majority of participants in both groups reported that it affected their physical health, daily life, and community. The group with a history of forest burning reported more economic problems (69.2 percent to 24.1 percent) and employment (occupational) problems (46.2 percent to 24.1 percent) than the other group.

This survey has limitations because it focuses on a single interview and relies on interview data and participant perceptions rather than establishing explicit numerical criteria for identifying psychological problems. However, the study's findings found that over half of persons with a history of forest burning have mental health and substance misuse issues, as well as psychosocial issues such as unemployment and economic problem, which are all factors that support such behavior. The study's findings may not directly conclude that psychiatric symptoms and substance abuse are the causes of forest burning behavior and $PM_{2.5}$ problems, but they can help increase understanding and awareness for communities and society about the "men in black" and those who will engage in forest burning behavior in the future. Understanding the reasons that contribute to their behaviors, as well as the underlying issues that drive each person's behavior, will lead to appropriate and successful long-term solutions. For example, psychiatric and substance abuse assessment, self-care rehabilitation and vocational training, or solving economic and community problems, these may help reduce forest burning behaviors that occur due to these factors.

**This abstract is part of the project Comments on $PM_{2.5}$ Problems and Burning Behavior and Impact on Community Psychosocial Aspect: A Case Study of National Park Communities, supported by research funding from Hub of Talents on Air Pollution and Climate, National Research Council of Thailand.*

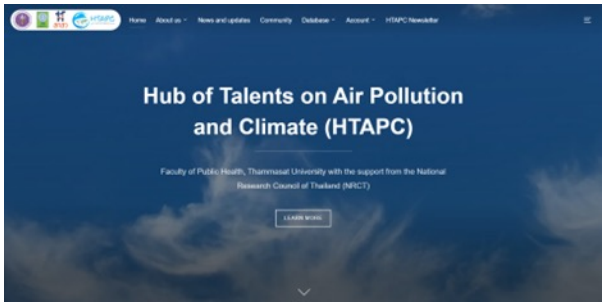
## We cordially invite you to join us

Hub of Talents on Air Pollution and Climate

HTAPC Membership Form for Experts

Official website of Hub of Talents on Air Pollution and Climate (HTAPC)

https://www.htapc.info




This newsletter is part of the project for the Hub of Talents on Air Pollution and Climate under research funding support from National Research Council of Thailand (NRCT)

## Monthly Newsletter

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