SOMPOKE KINGKAEW

Keystone Thammasat, A814, Klong Luang, Pathum Thani 12120, Thailand
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EDUCATION

Ph.D. Candidate in Environmental Engineering and Management

2015-2023 **Asian Institute of Technology (AIT)**, Thailand. **CGPA: 3.92/4.00**. Coursework focused on Advanced Remote Sensing, Advanced Applications and Spatial Methods in GIS, and Advanced Digital Mapping. Special Study: “Development of Near Real-Time Emission Estimation for Northern Thailand”. Ph.D. Dissertation: “Estimation of Biomass Open Burning Emissions for Air Quality Forecast during Haze Pollution in Northern Thailand”.

M.Sc. (The Most Outstanding) in Environmental Engineering and Management

2011-2013 (Environmental Technology and Management)
Asian Institute of Technology (AIT), Thailand. **CGPA: 3.94/4.00**. Coursework focused on Air Pollution Engineering and Management, Air Pollution Modeling and Applications, Design of air Pollution Control System, The Science of Climate Change and Co-benefit, Environmental Chemistry and Laboratory, Environmental Impact Assessment, and Environmental Quality Management. Master Thesis: “Application of Photochemical Smog Modeling System for Ozone Air Quality Management in Bangkok Metropolitan Region (BMR) under Transport Fuel Scenarios”.

B.Sc. (The Most Outstanding of First-Class Honors) in Public Health

2007-2011 (Environmental Health Science)
Environmental Health Science, Faculty of Public Health, **Mahidol University**, Bangkok, Thailand. **CGPA: 3.74/4.00.** Coursework focused on Air Pollution Control and Management, Environmental Health Engineering Survey and Practice, Sanitation Abatement and Control, Environmental Epidemiology and Toxicology, and Principle of Environmental Impact Assessment. Senior Project: “Application of the AAMA Community Noise Modeling on Traffic Noise Level Estimation in Different Residential Areas of Bangkok Vicinity”.

PROFESSIONAL EXPERIENCE

Oct 2023 – Present	**Principal Investigator** (Founder), Collaborating Center for Clean Air and Climate Change (CCCACC), Thammasat University, Thailand. **Senior Editor** for HTAPC Newsletter.
Oct 2015 – Sep 2023	**Full-time Lecturer**, Thammasat University (Rangsit Center) Instructed in the coursework of ▪ Air Pollution Management and Control ▪ Environmental Health Engineering ▪ Modeling for Environmental and Occupational Health ▪ GIS and Database Applications in Environmental Health Information Systems
Jun 2013 – Mar 2015	**Research Associate**, Asian Institute of Technology (AIT)
Mar – May 2010	**Intern**, TEAM Consulting, Bangkok, Thailand

RESEARCH AREAS

- AI-powered near real-time environmental data service platform
- Air quality and climate modeling (e.g., WRF-Chem, WRF-CAMx, MPAS, CMIP6)
- Atmospheric remote sensing and GIS with near real-time web-based applications
- Severe climate extreme event mitigations and adaptation

TECHNICAL SKILLS

- Numerical Modeling: WRF, WRF-Chem, WRF-CAMx, MPAS
- Programming Language: R, Python, Unix, Fortran, HTML, NCL, CDO, NCO
- Operating System: Linux Server, Windows Server, MacOS System
- Other Tools: PowerBI, WordPress, LINE Developer, Looker, Google AppScript

PAST AND CURRENT RESEARCH PROJECTS

Experienced PI of more than 10 projects and Co-PI for more than 7 projects.

Apr 24-Sep 24 [PI]	Scoping review: Thailand National Emission Inventory (Funding: Hub of Talents on Air Pollution and Climate (HTAPC))
Mar 23-Mar 24 [PI]	Development of thunderstorm and rainfall risk prediction system considering the effects of aerosol-cloud interactions in Thailand using WRF-Chem simulations (Funding: National Research Council of Thailand)

Mar 22-Aug 23 [PI]	Development of air quality management data platform for Bangkok Metropolitan Administration (BMA) (Funding: BMA)
Jul 21-Aug 23 [PI]:	Development of $PM_{2.5}$ assimilative capacity forecasting system for effectively reducing $PM_{2.5}$ emission from open burning activities at local administrative levels in Thailand (Funding: National Research Council of Thailand)
Apr 23-Apr 24 [Co-PI]	Evaluation of the implemented measures for $PM_{2.5}$ reduction and development of the future measures (Funding: National Research Council of Thailand)
July 22-Nov 23 [Co-PI]	New roadmap for Free Haze ASEAN (Funding: ASEAN Secretariate)
Jul 22-Nov 23 [Co-PI]	Prediction of short-term health impacts from $PM_{2.5}$ pollution in Bangkok (Funding: Thai Health Organization)
May 21-Aug 23 [Co-PI]:	Contribution of Inside and Outside-city Air Pollution Sources to the $PM_{2.5}$ Concentration of the Mitigation Measures of the Transport Sector in Bangkok (Funding: National Research Council of Thailand)
2021-2024 [Co-PI]:	e-Asia Project: Health Impacts of Climate Change in Thailand: Current Impacts and Its Implication (Funding: National Research Council of Thailand)
Nov 21-Nov 22 [Co-PI]	Identification of PM Sources in Na Phra Lan Pollution Control Zone, Saraburi Province (Funding: Pollution Control Department of Thailand)
Jul-Sep 20 [PI]:	Compilation of Emission Factors for Crop Residue Open Burning (Funding: Pollution Control Department)
Jul-Aug 20 [PI]:	Automated WRF Processing (Funding: Pollution Control Department of Thailand)
May-Aug 20 [PI]:	The Study of Infectious Waste Management in Thailand and Recommendations on Framework of Management Policy (Funding: Department of Health, Ministry of Public Health)
Jan-Aug 20 [PI]:	Development of Emission Inventory for Transport Sector in Thailand under Scenarios of Alternative National $PM_{2.5}$ Management Policy (Funding: Thailand Development Research Institute)

2019-2020 [PI]:	Development of Air Quality Data Management System for Bangkok Metropolitan Administration (Funding: Sithiporn Associates Co., Ltd.)
2018 [Co-PI]:	Reducing Mercury Emission from Coal Combustion in the Energy Sector in Thailand (Funding: UN Environment)
2012-2014 [RA]:	Study of Ground-level Ozone in Bangkok Metropolitan Region by Advanced Mathematical Modeling for Air Quality Management. (Funding: PTT Public Co., Ltd.)

SELECTED CONFERENCE PRESENTATIONS:

- **Kingkaew, S.**, Paijityotee, K., Kamkon, R., Saphankaew, P., Kajonpetch, P., Kaewwongsa, N., Kingkaew., K., Wangwongwatana, S., Winijkul, E., Kirtsaeng, S., & Sriyotha, P. (2024). Development of a Thunderstorm and Rainfall Risk Forecasting System for Thailand: Considering the Effects of Aerosol-Cloud Interactions Using WRF-Chem. In 2024 APARC Reanalysis Intercomparison (A-RIP) Planning Workshop, Boulder, CO, USA.
- **Kingkaew, S.**, Kim Oanh, N. T., Winijkul E. & Paijityotee, K. (2023). Development of top-down FRP-based biomass fire emission inventory for $PM_{2.5}$ air quality modeling using WRF-Chem modeling system in northern Thailand. In the 20th Global Emission InitiAtive (GEIA) Conference: Towards mitigating air pollutant and greenhouse gas emissions, Brussels, Belgium.
- **Kingkaew, S.**, Paijityotee, K., & Wangwongwatana. S. (2023). Performance of Next Five-day $PM_{2.5}$ Air Quality Forecasting using WRF-Chem Modeling System in Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.
- **Kingkaew, S.**, Kajonpet P., Paijityotee, K., Wangwongwatana, S., Winijkul, E. & Kingkaew, K. (2023). Development of $PM_{2.5}$ assimilative capacity forecasting system for effectively reducing PM2.5 emission from biomass burning at local administrative levels in Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.
- Paijityotee, K. & **Kingkaew, S.** (2023). Estimation of Semi-real-time Bottom-up Traffic Emissions Using GPS Traffic Probe Data for $PM_{2.5}$ Simulation using WRF-Chem Modeling in Bangkok, Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.

- Saphankaew, P., Kamkon, R. & **Kingkaew, S.** (2023). Near Real-time Retrieval of Ground-level $PM_{2.5}$ Concentrations from Different Five MODIS Aerosol Optical Depth Products Over Bangkok, Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) workshop, Dhaka, Bangladesh.
- Diwatthanaphong S., Seesoddee T., Suwanrerk S., Paijityotee K. & **Kingkaew S.** (2019). Roadside Fine Particulate Matter and Its Bounded Heavy Metals in Bangkok and Pathumthani, Thailand. In National Conference on Air Quality in Thailand: $PM_{2.5}$.
- **Kingkaew, S.**, Paijityotee, K. & Eaktasang, N. (2019). Development of a next-day prediction for spatial PM2.5 distribution in Bangkok Metropolitan Region, Thailand. In TU-KU-MU-NAVY Conference 2019, Thammasat University, Pathumthani.
- Paijityotee, K., Rachachan, S. & **Kingkaew, S.** (2019). Fine particulate matter concentrations and size distributions during the post monsoon in northern Bangkok Metropolitan Region, Thailand. In the 2nd National Environmental Conference, Mahasarakham, Thailand.
- Chommanee, K., Paijityotee, K. & **Kingkaew, S.** (2019). Health risk assessment of particulate matter exposure from different means of public transport in Bangkok, Thailand. In the 2nd National Environmental Conference, Mahasarakham, Thailand.
- **Kingkaew, S.** & Eaktasang, N. (2018). Contribution of Transboundary Emissions of Biomass Open Burning to Haze Pollution in Bangkok Metropolitan Region, Thailand. In The 10th Better Air Quality Conference 2018, Kuching, Malaysia.
- Paijityotee, K., Sithprasert, C., Wootisen, W. & **Kingkaew S.** (2018). Thunderstorm Risk Mapping in Thailand. National Environmental Conference on Environment, Energy, and Health 2018, 76-77.
- **Kingkaew, S.** (2017). Variations of $PM_{2.5}$-to-PM_{10} ratios in Bangkok Metropolitan Region, Thailand [Poster]. In The Third Workshop on Atmospheric Composition and Asian Monsoon, Guangzhou, China.
- Permadi D.A., Kim Oanh, N.T., **Kingkaew, S.** & Chatchupong, T. (2016). Photochemical smog modeling for ozone air quality management in Bangkok Metropolitan Region [Poster]. In The International Global Atmospheric Chemistry (IGAC) Project 2016 Science Conference, CO, USA.
- **Kingkaew, S.**, Kim Oanh, N. T. & Permadi, D. A. (2015). Development of a high spatial resolution emission inventory and application of ozone air quality simulation in Bangkok Metropolitan Region, Thailand [Poster]. In The Second Workshop on Atmospheric Composition and the Asian Summer Monsoon (ACAM), Bangkok, Thailand.

- Chatchupong, T., **Kingkaew, S.**, Permadi, D.A. & Kim Oanh, N.T. (2014). Ozone air quality management in Bangkok Metropolitan Region, Thailand: PTT scientifically perspective strategies and plan. In The Air and Waste Management Association's Annual Conference and Exhibition, AWMA, CA, USA. 2, pp. 1345-1349.

REPORT AND BOOK CHAPTERS:

- **Kingkaew, S.**, Kajonpetch, P., Kingkaew., K., Paijityotee, K., Kamkon, R., Saphankaew, P., Kaewwongsa, N., Wangwongwatana, S. & Winijkul, E. (2024). *Development of $PM_{2.5}$ Assimilative Capacity Forecasting System for Effectively Reducing $PM_{2.5}$ Emission from Open Burning Activities at Local Administrative Levels in Thailand*. National Research Council of Thailand.
- Winijkul, E., **Kingkaew, S.** & Paijityotee, K. (2023). *Contribution of Inside and Outside-city Air Pollution Sources to the $PM_{2.5}$ Concentration of the Mitigation Measures of the Transport Sector in Bangkok*. National Research Council of Thailand.
- **Kingkaew, S.**, Paijityotee, K., Kamkon, R., Saphankaew, P., Kajonpetch, P., Kingkaew., K., & Wangwongwatana, S. (2023). *Development of Air Quality Management Data Platform for Bangkok Metropolitan Administration*. CCCACC, Thammasat University.
- Tangkitvanich, S., Thampanishvong, K., Israngkura Na Ayutthaya, A., Pongpiachan, S., Attavanich, W., Jarungratanapong, R., **Kingkaew, S.**, Bhumiwat, P., Tanmanthong, S., & Vichitanan, A. (2021). *Policy Options of $PM_{2.5}$ Emission Control Scenarios in On-road Transport Sectors, Thailand*. Thailand Development Research Institute (TDRI), presented to the Thai Automotive Industry Association.
- Watchalayann, P., Soonthornchaikul, N., Laokiat, L., Leelapaiboon, S., Eaktasang, N., Wongsoonthornchai, M., Thitanuwat, B. & **Kingkaew, S.** (2018). *Final Report Reducing Mercury Emission from Coal Combustion in the Energy Sector in Thailand: A UN Environment Report*. UN environment: Chemicals and Wastes Branch.
- Kim Oanh, N.T., Pongkiatkul, P., **Kingkaew, S.** & Surapipith, V. (2015). Chapter 2: Air quality management in Bangkok Metropolitan Region, Thailand. In Kim Oanh, N.T. (Eds.), *Air Pollution Research Network for Improving Air Quality in Asian Developing Countries: Compilation of Findings*. NARENCA, ISBN: 978-604-904-410-6, pp. 19-40.
- Kim Oanh, N.T., Permadi, D.A., **Kingkaew, S.**, Chatchupong, T. & Pongprueksa, P. (2015). *Study of Ground-level Ozone in Bangkok Metropolitan Region by Advanced Mathematical Modeling for Air Quality Management*. PTT Public Co., Ltd.

INVITED LECTURER AND SPEAKER:

- Aug 2024. MHESI Fair 2024, Bangkok. *Air Quality Forecasting in Thailand*.
- Jun 2022. Thailand National Research Council Fair 2022. *Experience Sharing in Environmental and Natural Resources Research in Thailand*.
- Mar 2021. Thai PBS News. *$PM_{2.5}$ Disaster: Advance Forecasting and Development of Mobile Application*.
- Mar 2021. Class of Master of Environmental Engineering, Kasetsart University. *ENSO and Air Quality Situation in Thailand*.
- Feb 2021. AI Center, AIT. *INDUSTRY TRANSFORMATION WITH BIG DATA & AI: Leverage Big Data & AI to Make Optimal Operational Decisions*.
- Mar 2020. Khu khot Municipality, Pathumthani. *Air Quality and COVID-19: Situation and Prevention at Administrative Level.*
- Mar 2020. Electricity Generating Authority of Thailand (EGATT). *What to know about $PM_{2.5}$: Stituation and Coping*.
- Dec 2020. Bangkok Metropolitan Administration. *Emission Inventory Development in Bangkok Workshop*.
- Dec 2019. Environmental Impact Assessment Division, MoPH. *Climate Change and Health Effects of Air Pollution.*
- Nov 2019. Bangkok Metropolitan Administration. *$PM_{2.5}$ Air Quality in Bangkok*.
- Dec 2016. Undergraduation Class of Faculty of Public Health, Valaya Alongkorn Rajabhat University. *Introduction of Air Pollution Toxicology*.

PREVIOUS STUDENT SENIOR PROJECTS:

- Sasina Phasukkam and Fontip Songphram (2021). Protection efficiency of surgical mask on roadside mold and $PM_{2.5}$ exposure using a designed closed-box manikin experiment.
- Siriluk Chairungruengsin and Kalyakorn Poungpikul (2021). Estimation of particulate matter emissions in construction sites using low-cost sensors and mini-volume and personal environmental monitoring air samplers.
- Diwatthanaphong S., Seesoddee T., and Suwanrerk S. (2019). Roadside fine particulate matter and its bounded heavy metals in Bangkok and Pathumthani.
- Kantachai Paijityotee (Ph.D. Candidate at Thammasat University) and Satita Rachachan (2019). Fine particulate matter concentrations and size distributions during the post monsoon in northern Bangkok Metropolitan Region, Thailand

- Kanittha Chommanee and Kantachai Paijityotee (2019). Health risk assessment of particulate matter exposure from different means of public transport in Bangkok, Thailand (Poster presentation in the 2nd National Environmental Conference).
- Kantachai Paijityotee, Chanpen Sitprasert and Wissuta Woothisen (2018). Thunderstorm Risk Mapping in Thailand (Received the best poster presentation award in the 1st National Environmental Conference in climate change section).
- Racha Samermirt (Ph.D. Candidate at Kyoto University) and Rachaya Intarawichai (2017). Health effects of biomass open burning emission on residing students in a university campus of Thailand.

KEY DEVELOPED PROTOTYPES:

- **Active Fire Emission Rapid Dataset (AFERD):** Near real-time active biomass fire emission dataset for air quality modeling and forecasting
- **Thailand Anthropogenic EMIssion Processor (TAEMIP):** Fortran-based emission processor for CAMx and CMAQ air quality modeling
- **Carbon Bond Emission Processor (CBEP):** Fortran-based emission format processor for CAMx air quality modeling
- **Nong Fang Kaow System:** $PM_{2.5}$ assimilative capacity forcasting system for application of prescibed biomass open buring administration system using WRF-Box forecasting system with LINE ChatBot application
- **Na Pha Yu System:** Thunderstorm and rainfall risk forecasting system using WRF-Chem forecasting system with LINE ChatBot application
- **Akat.ai:** ChatGPT powered air quality and weather forecast

AWARDS AND HONORS

Sep 2019 Received the “First Runner-up” in Entrepreneurship Poster Competition, AIT.

Aug 2011 Received Thai Royal Government and AIT Scholarship pursued Ph.D. at AIT.

May 2013 Received “The Robert B. Banks Prize” Represented the Most Outstanding Student in Environmental Engineering and Management (ETM), AIT.

Aug 2011 Received Thai Royal Government Scholarship pursued Master degree at AIT.

Jul 2011 The Most Outstanding Student of Faculty of Public Health, Mahidol University.

Nov 2009 The Most Outstanding Student Prize” in Public Health from Prof.Tab Neelaniti’s Foundation, Bangkok, Thailand.