**Title :** Impact of Meteorological Factors on PM2.5 Concentrations During Biomass Burning Seasons in Chiang Mai from 2020 to 2024

**Author(s) :** **1.** Sadanon Jaisaksern **Student ID :** 640515008

**Major :** Environmental Science

**Advisor(s) :** **1.** Assistant Professor Dr. Wan Wiriya

**Type of presentation*** *(choose 1)* **:**

- ☐ **Oral Presentation** (เฉพาะ ตัวแทนนศ.ที่สาขาเลือกให้นำเสนอแบบบรรยาย)
- ☑ **Poster** (กรณี นำเสนอผลงานปัญหาพิเศษ/การค้นคว้าอิสระ)
- ☐ **Cooperative Education** (กรณี นำเสนอผลงานสหกิจศึกษา)

## ABSTRACT

Smoke haze in northern Thailand is primarily caused by biomass burning. Fine particulate diameter less than 2.5 micrometers (PM2.5) was polluted during the dry season from February to April. This study focuses on investigating the influence of meteorological factors on PM2.5 concentrations in Chiang Mai over a five-years period (2020-2024). The data were obtained from air quality monitoring stations and the Northern Meteorological Center of Thailand. The result indicates that PM2.5 concentrations exceeded the national standard of 37.5 µg/m³. The 24 hours average PM2.5 concentrations were ranged from 5 to 236 µg/m³ (58.63 ± 30.91) during the biomass burning season. The highest PM2.5 concentration peaked in 2023. Fire hotspot activity exhibited a strong positive correlation with PM2.5 ($r = 0.59$, $p < 0.01$), confirming that biomass burning is a major pollution source. Humidity and wind speed played critical roles in pollution dispersion. High humidity contributed to particulate removal, while strong winds helped clear pollutants, reducing PM2.5 concentrations. Weak winds and stagnant atmospheric conditions, combined with low ventilation rates, led to pollutant buildup. Ventilation rates in the morning were negatively correlated with PM2.5 concentrations ($r = -0.32$, $p < 0.01$). Mixing height variations also influenced pollution dispersion. Lower mixing heights in the morning trapped pollutants near the surface, whereas higher afternoon mixing heights facilitated their dilution. Backward

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*

trajectory analysis using HYSPLIT confirmed that transboundary pollution from Myanmar and Mae Hong Son significantly contributed to PM2.5 levels in Chiang Mai. These findings emphasize the urgent need for stricter biomass burning regulations, improved fire prevention measures, and stronger regional cooperation to mitigate transboundary air pollution. Enhancing early warning systems based on meteorological forecasting can support proactive interventions, ultimately reducing public health risks associated with PM2.5 exposure.

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*