SMART CITY AIR QUALITY ASSESSMENT

COMPARING PM2.5 LEVELS IN URBAN AND DAM AREAS

Nanthapope Chansraku, Jiratthiphan Suwannasindhu, Thanapon Manont, Napat Srithai, Yannapon Loangoen, Napassorn Pamali, Krongkran Somasa, Parin Srirat, Kananek Thongplub, Kittipod Norkam, Chithayagorn Sinthunarong, Suppanut Chuangchot, Natthanun Sumalu, Sirawit Thithong, Theethatchanon Sanphae

OUR TEAM

INTRODUCTION

PM2.5 to particulate matter with a diameter of 2.5 micrometers or smaller. These microscopic particles are about 30 times smaller than the width of a human hair. Due to their small size, they can penetrate deep into the respiratory system, posing significant health risks. (Hung et al., 2020)

NATURAL SOURCES

Dust storms

Volcanic eruptions

Forest fires

RESPIRATORY DISEASES

Asthma

Chronic bronchitis

Lung cancer

MAN-MADE SOURCES

Burning fossil fuels

Industrial activities

Construction and demolition

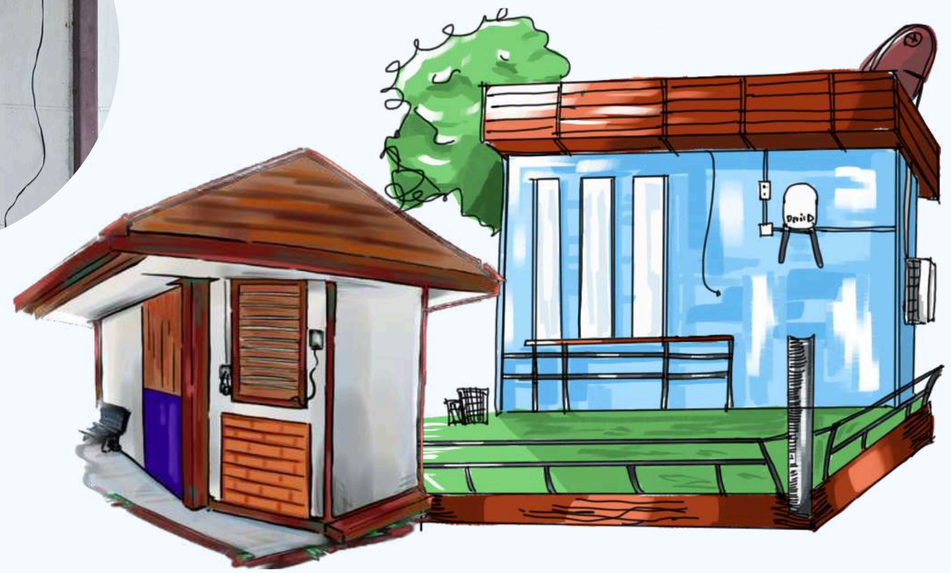
CARDIOVASCULAR DISEASES

Heart attacks

Stroke

OBJECTIVE

This research paper aims to investigate and compare the levels of PM2.5 air temperature, and relative humidity levels in the city and the dam area, using Davis AirLink to provide a more granular understanding of air quality in these three distinct environments

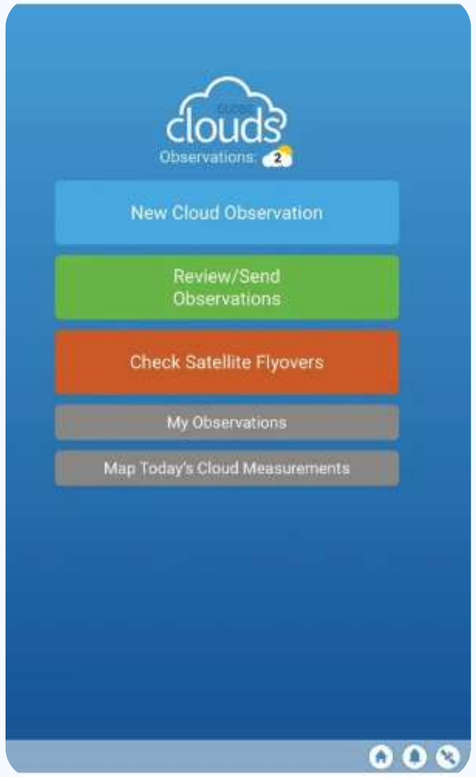


MATERIALS AND METHODS

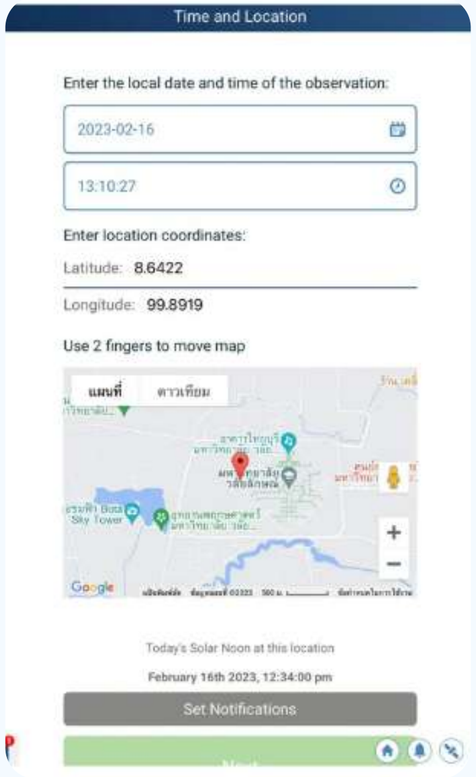
Figure 2 Map of Saraburi and Nakhon Si Thammarat provinces, Thailand. (a) Map of the Pa Sak Museum, Saraburi Province and (b) Map of Suphattra Resort and (c) Map of Walailak University, Nakhon Si Thammarat.

MATERIALS AND METHODS

1.Choose Cloud App.



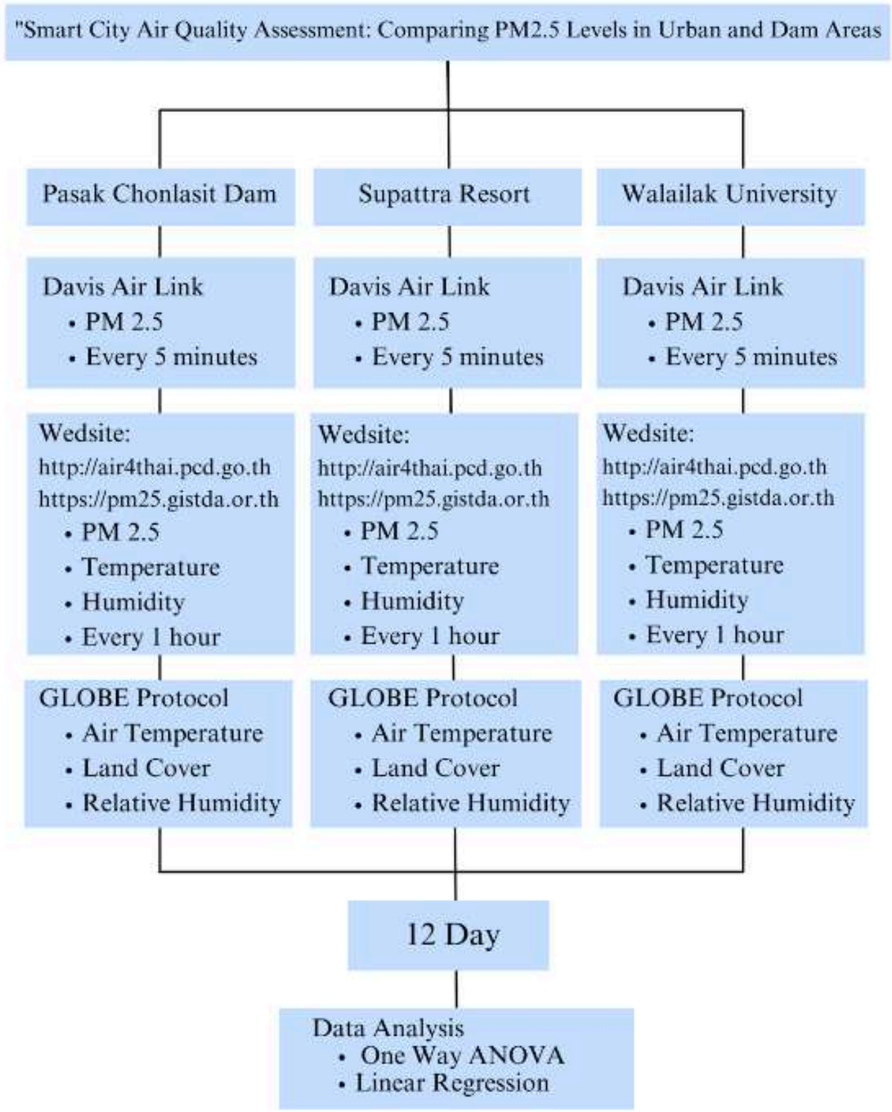
2. Choose New cloud observation.



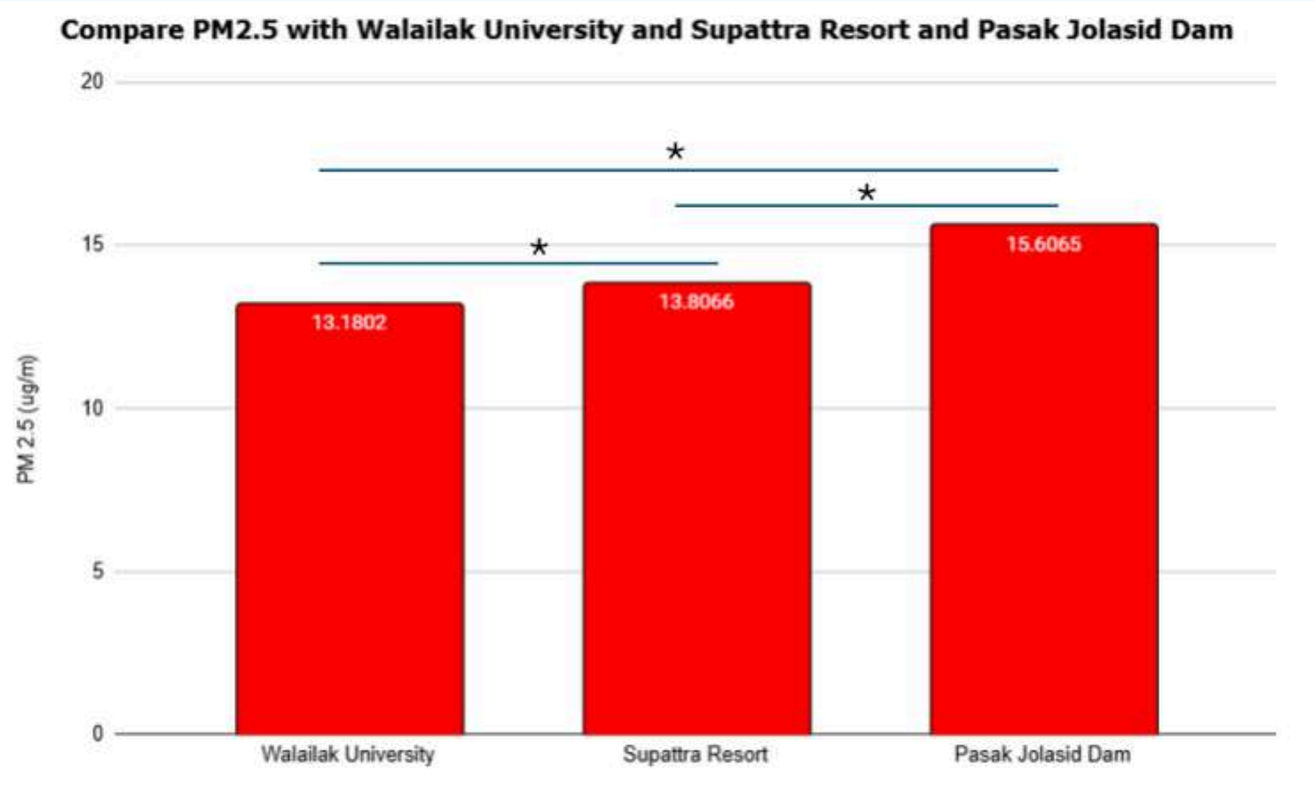
3.Observe the sky, the clouds.

4.don't forget the clouds at the edge of the cloud.

MATERIALS AND METHODS

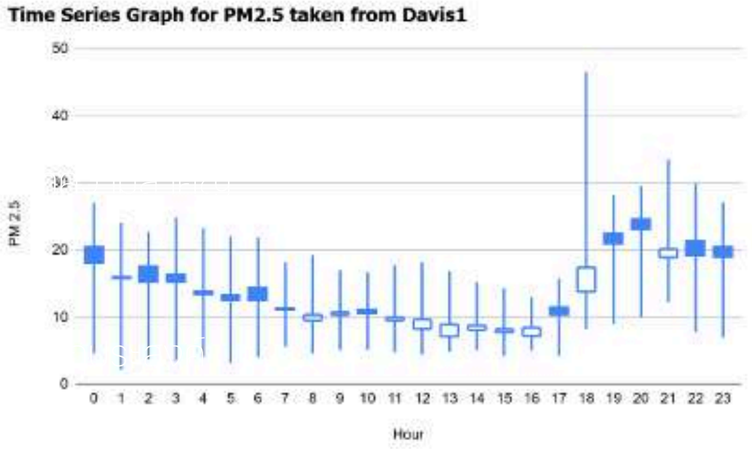


RESULTS AND DISCUSSION

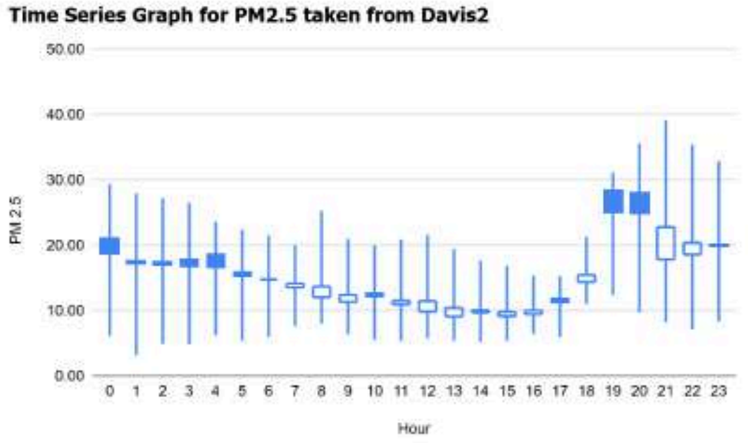


PM2.5 levels at Walailak University, Supattra Resort, and Pasak Jolasid Dam showed no significant correlation. Walailak University had the lowest levels due to its greenery and minimal pollution sources. Supattra Resort had slightly higher levels, likely from tourism, while Pasak Jolasid Dam recorded t he highest, influenced by topography, agriculture, and transportation.

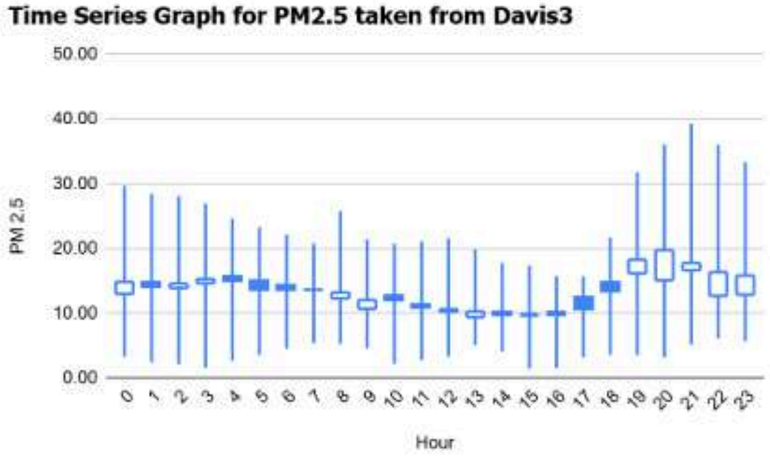
RESULTS AND DISCUSSION



(a)



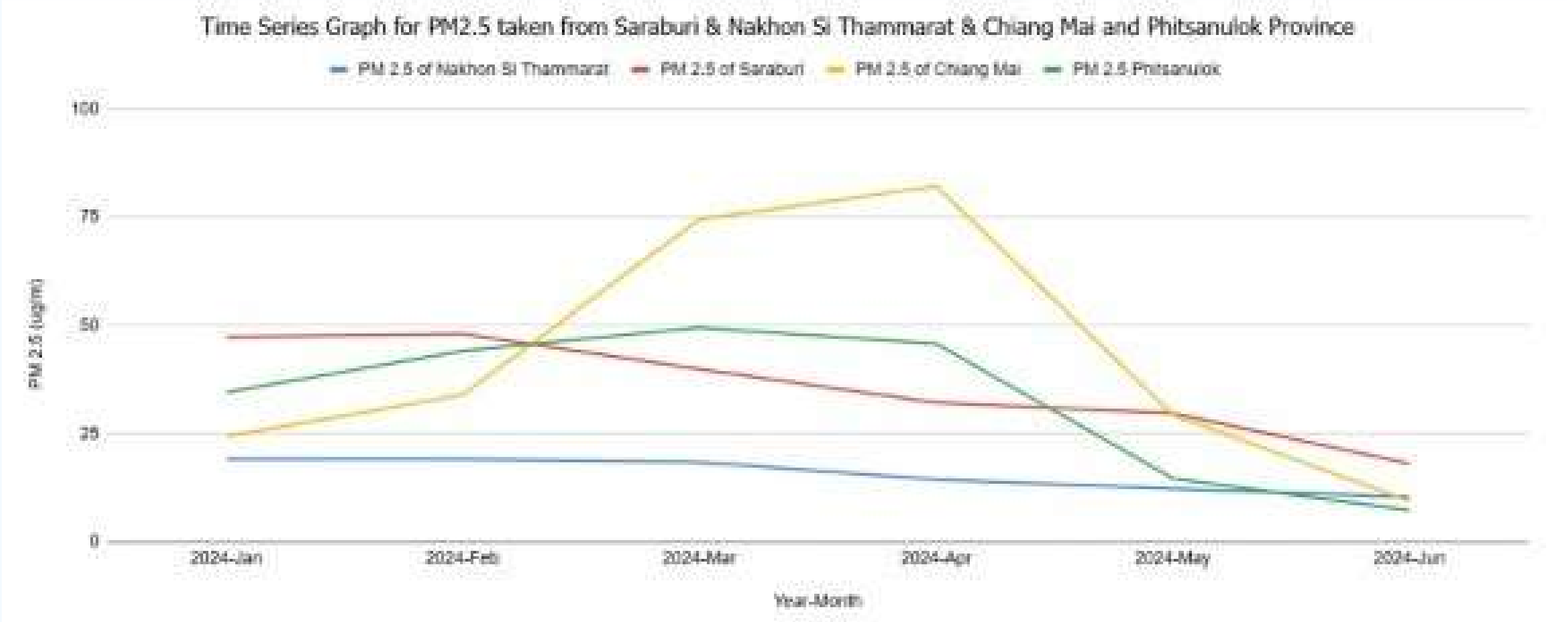
(b)



(c)

Both PM2.5 levels drop in the morning and afternoon and rise in the evening and overnight. In Graph 1, the nighttime rise is due to burning sappanwood and fires for mosquito repelling. In Graph 2, nearby factories are the cause, while in Graph 3, vehicle emissions are responsible.

RESULTS AND DISCUSSION



PM2.5 levels showed a contrasting trend across provinces. In Saraburi and Nakhon Si Thammarat, levels decreased steadily from nearly 50 µg/m³ in January to about 20 µg/m³ in May. Conversely, Chiang Mai and Phitsanulok saw a sharp increase from 37 µg/m³ in February to a peak of 85 µg/m³ in April, before gradually declining.

GLOBE PROTOCOL

Cloud information was collected using the GLOBE Cloud Protocol, as clouds can influence air quality in various ways. Clouds can reduce sunlight, affecting pollutants like ground-level ozone, a major component of smog. As masses of condensed water vapor, clouds can impact air composition, temperature, wind, and humidity, with variations depending on their size, formation time, movement, and dissipation.

CONCLUSION

This research monitored PM2.5 levels over 12 days, showing higher concentrations at Supattra Resort and Walailak University due to burning sappanwood and heavy traffic. PM2.5 levels peaked during the dry season (February-May) and decreased afterward. The study highlights health risks and provides insights for future air quality management. It connects local air pollution to global concerns, with recommendations for reducing pollution. Collaboration with STEM professionals and the use of student-designed sensors improved accuracy. We thank our mentors and supporting institutions.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THANK YOU.