

THE STUDY OF AIR POLLUTION PROBLEM IN RATCHABURI PROVINCE BY  
GEOGRAPHIC INFORMATION SYSTEM AND REMOTE SENSING

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M.Sc. (TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT)

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ABSTRACT

This research is to study the concentrations of particulate matters (PM<sub>10</sub>) and sulfur dioxide (SO<sub>2</sub>) spreading in Ratchaburi province. Several sources can contribute to the Ratchaburi province air pollution problem such as power plants, industries, and agricultural activities. The PM<sub>10</sub> and SO<sub>2</sub> can cause health hazards if their concentrations are larger than the allowable standards. It is therefore very important to monitor the concentrations regularly so that an alert can be deployed if the concentrations are higher than standard values. Presently, there are four air quality motoring stations measuring PM<sub>10</sub> and SO<sub>2</sub> concentrations continuously. However, only four stations may not be enough to cover the entire province, but building more motoring stations to cover the extended area requires a high budget and operating cost.

This study shows that remote sensing can be used to estimate PM<sub>10</sub> and SO<sub>2</sub> concentrations. The concept is to create relationships between the atmospheric path radiances of Landsat 8 OLI/TIRS (independent variable) and PM<sub>10</sub> concentration (dependent variable). The same concept was applied to the SO<sub>2</sub> estimation. With these relationships ( $R^2$  is 0.69 for PM<sub>10</sub> and 0.75 for SO<sub>2</sub>), the temporal and spatial concentrations of PM<sub>10</sub> and SO<sub>2</sub> can be estimated.

KEY WORDS: ATMOSPHERIC PATH RADIANCE / REMOTE SENSING /  
LANDSAT / PARTICULATE MATTER / SULFUR DIOXIDE

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