UNIVERSITI TEKNOLOGI MARA

THE EVALUATION OF HIMAWARI-8 IMAGES FOR CLOUD CLASSIFICATION IN MALAYSIA

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Thesis submitted in fulfillment of requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my work unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Cloud seeding is a process to modify the clouds to produce rainfall. It is common in some countries that experience El-Nino phenomena that come with bad hazes and drought in long duration, such as Malaysia. Besides, the cloud seeding process is done by using small aircraft, which is costly and dangerous to pilots. Generally, this study is important to identify the suitable clouds for cloud seeding. Therefore, the purpose of this study is i) to compare the unsupervised classification using different bands of satellite imagery Himawari-8 ii) to identify the suitable band for the detection cloud seeding process. The method used in this study, such as ERDAS software for the processing image Himawari-8 and the area of type cloud has been used to detect the cloud classification. This study expects that comparison between the bands used in the Himawari-8 image will prove which band is suitable for the cloud seeding. Based on the comparison of image unsupervised classification done by using accuracy assessment and also a percentage of the cloud area, it shows that Fusion 2 detects more cloud types compared to Fusion 1, though the latter is more sensitive to rain-band clouds such as cumulonimbus. The cloud type detection process has been described. Finally, it is emphasized that the Himawari-8 high-frequency data usage is available every 10 minutes on full-disk and 2.5 minutes around Japan, as the image film makes it possible to detect detailed movements in the cloud system.

Keywords: Cloud Seeding, Unsupervised Classification, Himawari-8, Remote Sensing

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