

# EXPECTATION FOR THE PRESENCE OF HYDROCARBON SEEPAGE IN ONSHORE TROPICAL REGION, CASE STUDY IN MIRI SERAWAK MALAYSIA

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## ABSTRACT

Long term course of hydrocarbon seepage on material sediment and water alters mineralogical composition with corresponding change in chemical and physical properties of rocks and soils. This changes color, hardness, electric, magnetic and radioactive properties of minerals. This alteration product occurs at the surface coincide with the original product of seepage, namely gas emanation, crude oil and brine water effluent resulting change in fertilities rank soils and vegetation manifest which indicated with vegetation stress and bare development. This leads to change reflection, absorption accompany with change in albedo, change in surface thermodynamic and emission properties accompany with change in land surface temperature (LST). District of Miri, Serawak state of Malaysia is used for study area. This area is an urban area, located in the tropical region with the complex land cover system around the city, potentially having some hydrocarbon seepage due to existing petroleum system. Topographic map of Miri used to make boundary of internal and external seepage potential area, and LANDSAT ETM+ used to derivate of albedo and day time land surface temperature. The objective of study is to detect hydrocarbon seepage in onshore area through the investigation of the influence of the seepage existence on land surface albedo and land surface temperature. Intensive land use / cover classification and corresponding comparison of statistical analysis were performed on albedo, land surface temperature between internal and external seepage potential area. Two dimensional cross plots were also applied to predict the probability for finding the seepage. The result clearly shows that the presence of hydrocarbon causes the positive shift for the green area or high NDVI value, and negative shift for bare area or low NDVI value. The temperature was positive shifted by the presence of hydrocarbon for all NDVI class. This resulting of shift pattern and two dimensional cross plots allows to expecting the region for the presence of hydrocarbon seepage.

**Keyword** : hydrocarbon seepage, albedo, land surface temperature