



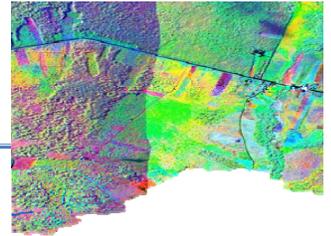
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# Distribution of vegetation diversity by hyperspectral sensor in Tropical Peatland, Central Kalimantan

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## 1 Background

- The main elements in peatlands are **plants**, water and soil.
- Change:
  - Land cover; from forest to agriculture
  - Function; from natural resource to production
  - Vegetation; from heterogeneous to homogeneous



## 2 Study area & data

- The study site has been chosen in a part Katingan District, Central Kalimantan. Location size is around 320 km<sup>2</sup> (20 km x 16 km) between 1° 47' 38.46" – 1° 56' 44.67" S and 113° 27' 18.72" – 113° 38' 19.17" E. This area has peat-swamp forest area, and geographically located in the equator region.

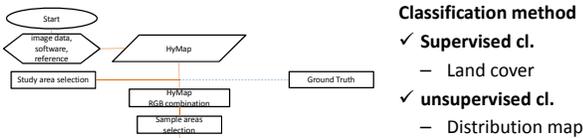
### Study area

### Data

Category	Spectral Range	Bandwidth interval (nm)	Average spectral
WS	0.45 – 0.89 μm	15 – 16 nm	15 nm
Nrk	0.89 – 1.35 μm	15 – 16 nm	15 nm
SWR1	1.40 – 2.40 μm	15 – 16 nm	13 nm
SWR2	2.95 – 2.40 μm	18 – 20 nm	17 nm

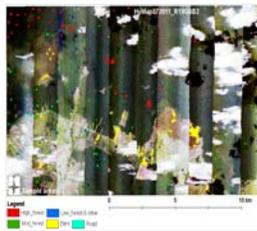
resolution	4.2 m
institutional	HyVista Co., Australia
number of band	124 bands
band average	15 – 20 nm
spectral range	0.456-2.490 μm
resolution	4.2 m

## 3 Methodology



### Classification method

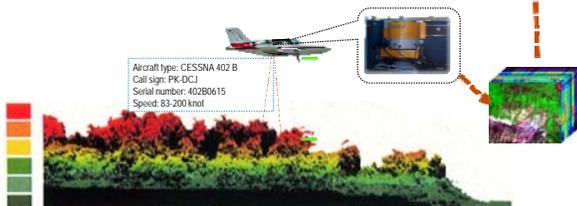
- ✓ **Supervised cl.**
  - Land cover
- ✓ **unsupervised cl.**
  - Distribution map



### Calibration process:

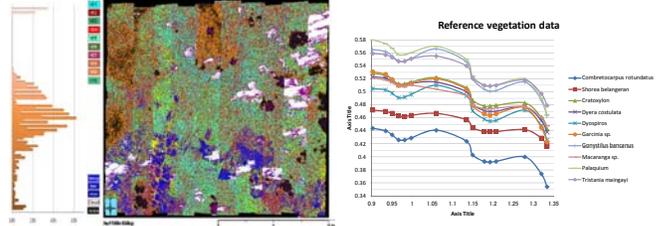
- value of geo correction is 10,000 based on information from the ERSDAC

Color	Frequency	Wavelength	HyMap
Violet	668-789 THz	380-450 nm	B 1 (450), B 2 (470)
Blue	613-668 THz	450-475 nm	B 1 (450), B 2 (470)
Cyan	606-630 THz	476-495 nm	B 3 (480)
Green	576-606 THz	495-510 nm	B 4 (500)-B 8 (562)
Yellow	508-526 THz	570-590 nm	B 9 (577)
Orange	484-508 THz	590-620 nm	B 10 (592)-B 11 (608)
Red	400-484 THz	620-750 nm	B 12 (629)-B 20 (745)



## 4 Analysis data

### Vegetation map by unsupervised cl. (K-means)



### Pearson's Correlation Coefficients

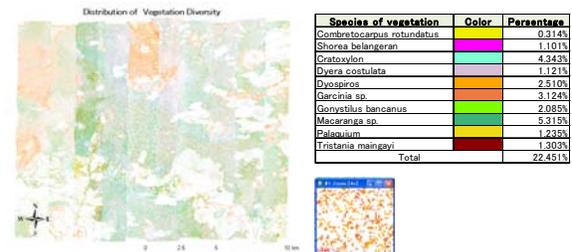
Correlation coefficients are used in statistics to measure how strong a relationship is between two variables.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

No.	Class No.	Ref. Veg.	r
1	72	Combretocarpus rotundatus	0.8617
2	56	Shorea belangeran	0.7982
3	61	Cratogeomys	0.8169
4	55	Dyera costulata	0.8060
5	40	Diospiros	0.9156
6	44	Garcinia sp.	0.8246
7	64	Gonyathus bancanus	0.8838
8	59	Mascananga sp.	0.7363
9	75	Palaquium	0.8355
10	68	Tristania manggavi	0.8416

## 5 Result

- For this study, K-means approach is better than ISODATA approach for vegetation map, based on the number of classes in data classification of previous researches in Central Kalimantan.
- The result of vegetation distribution map only based on the reference vegetation data without verified by ground truth (field observation)



## 6 Discussion

Interpretation of vegetation distribution is more difficult because of lacking reference data on the study site. So that map of the vegetation distribution still needs verify with ground truth to achieve the high degree of accuracy. Condition Kalimantan region is known overcast throughout the year, become difficult to obtain clear images from the satellite or hyperspectral sensors with Airborne. Lack of HyMap reference became an obstacle in achieving better result's interpretation.

## 7 References

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