

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

I begin with The Name of Allah, The Most Beneficent, The Most Merciful

EXPLORING PEAT SPATIAL VARIABILITY USING VLF METHOD

Proposed researcher :

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Dr. Lutz Fehrmann

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THE BACKGROUNDS

- ▶ Peatland is an important resource for the global climate due to its function as the world's carbon storage and the controlling agent for surrounding environment.
- ▶ According to the regulation of PP No 71/2014 jo PP No 57/2016 and Perpres No 1/2016 ;
 - ▶ Peat definition → thickness of 50 cm or more
 - ▶ 30% peat area around peat dome must be protected
 - ▶ Peat > 3 m thick must be protected
- ▶ Because of the large of peatland area, the new method to rapidly and easily extract information on peat spatial variability is needed and appreciated

THE AIM :

To prove whether or not VLF method have the capability to explore peat spatial variability

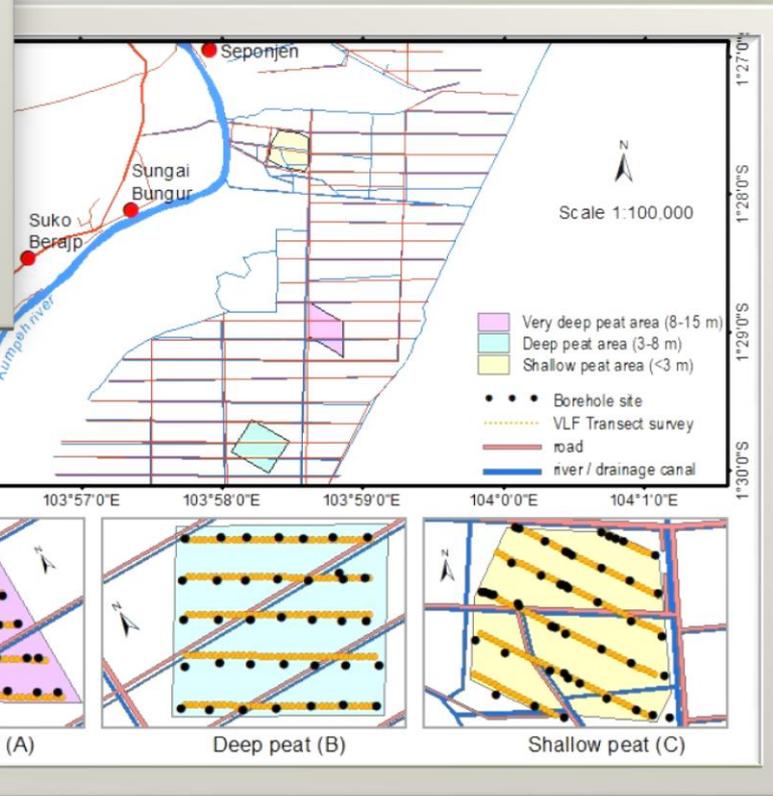
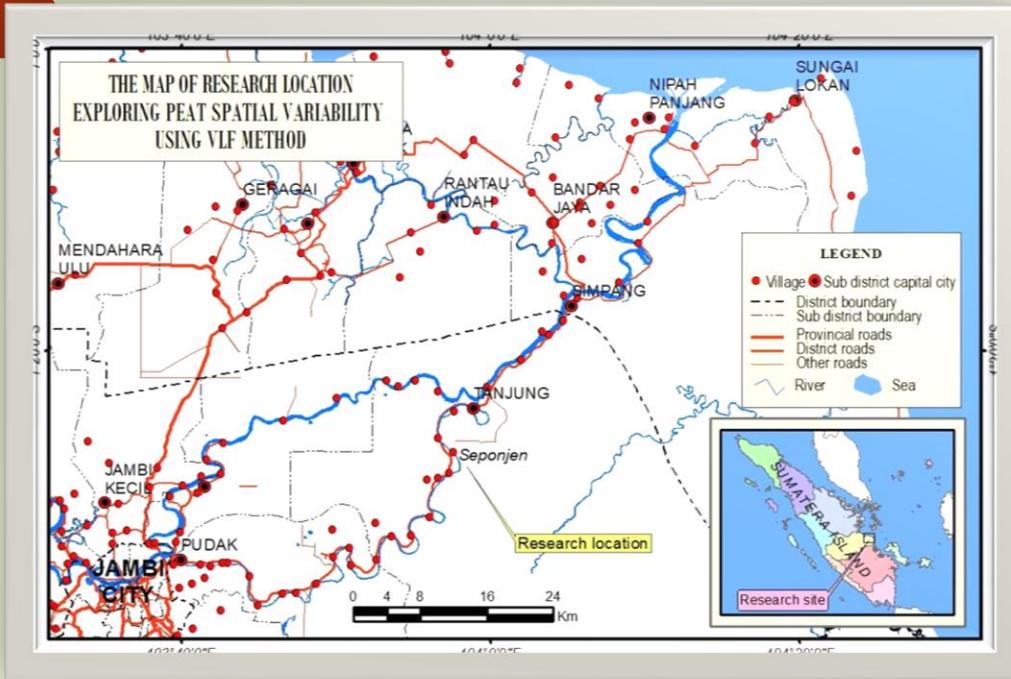
RESEARCH LOCATION

The location

Seponjen Village,
Sub District of Kumpeh,
Muaro Jambi District,
Jambi Province of Indonesia

The variable:

The variable is the range of peat depth:
A) very deep peat (8–11 m),
B) deep peat (3–8 m) and
C) shallow peat (0–3 m)

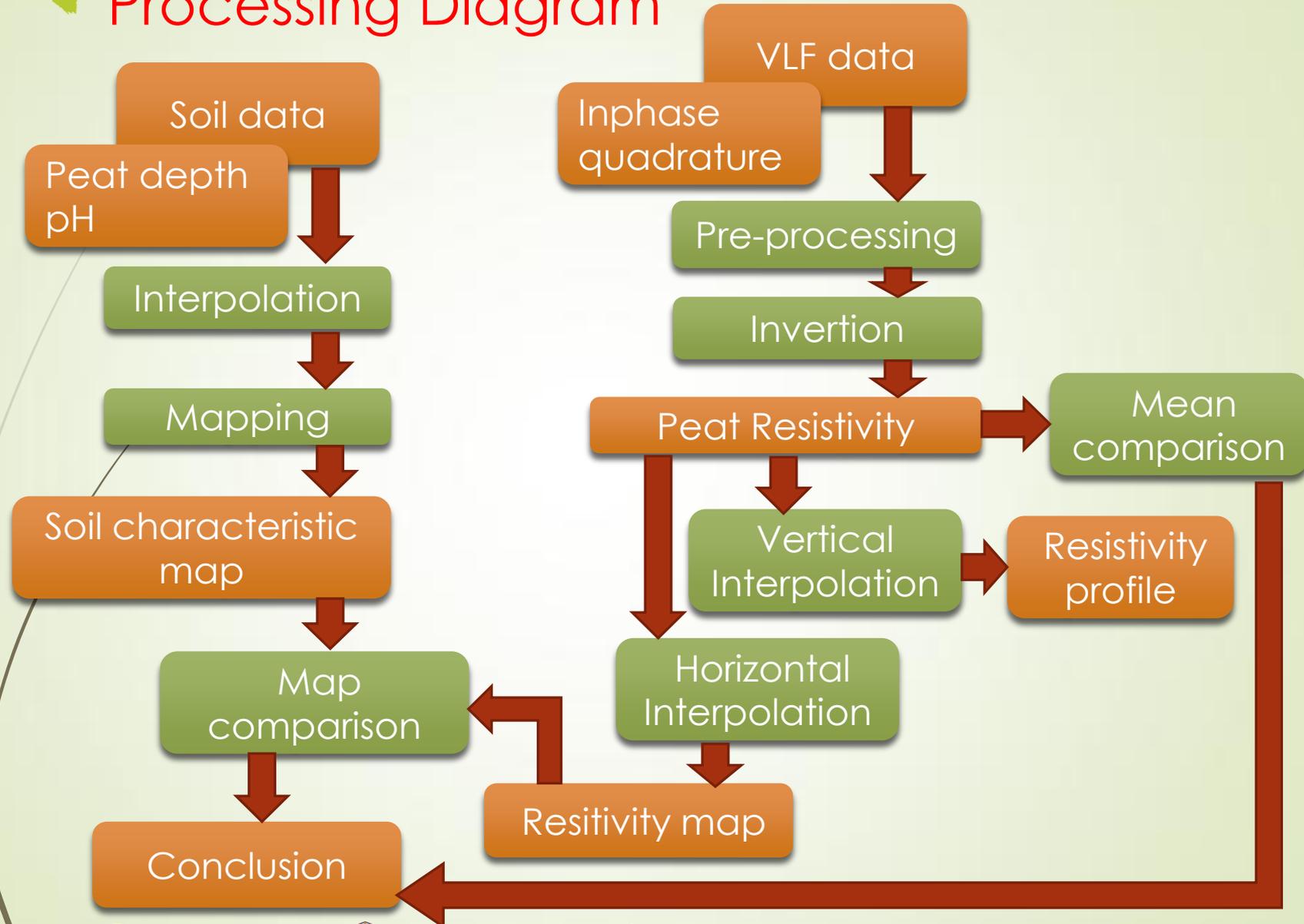


Data Acquisitions:

Measurements were done in transect lines

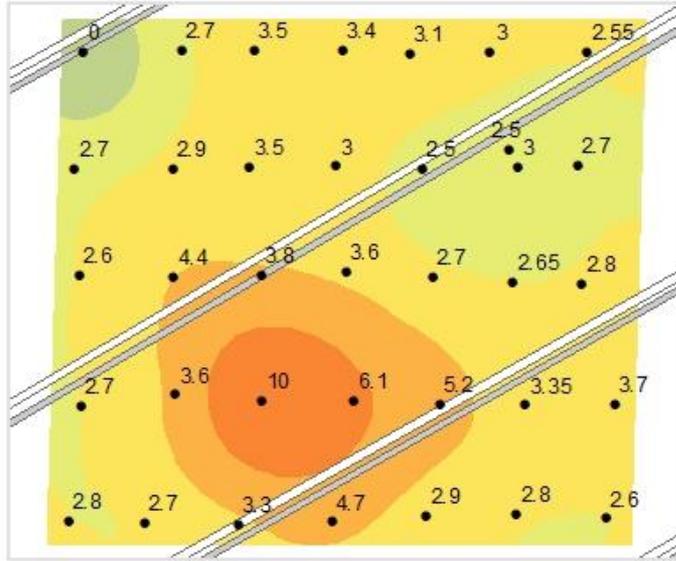
1. Soil data
Collected from borehole in every 80 meter
2. VLF data
Recorded in every 10 meter

Processing Diagram

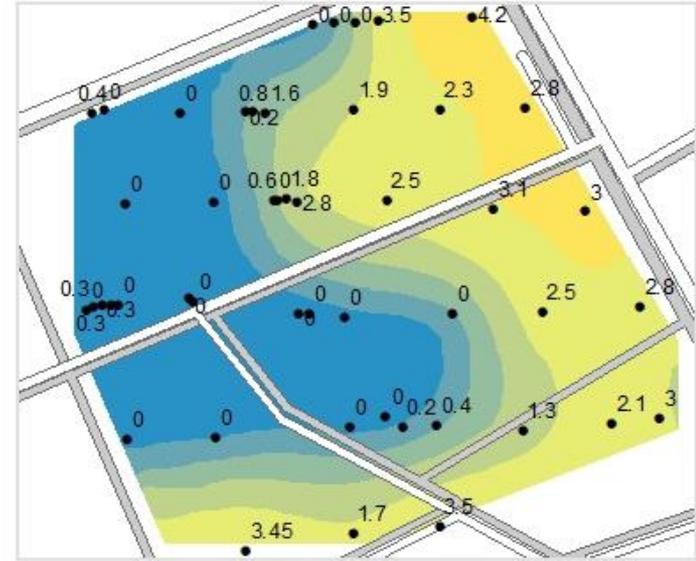


RESULTS

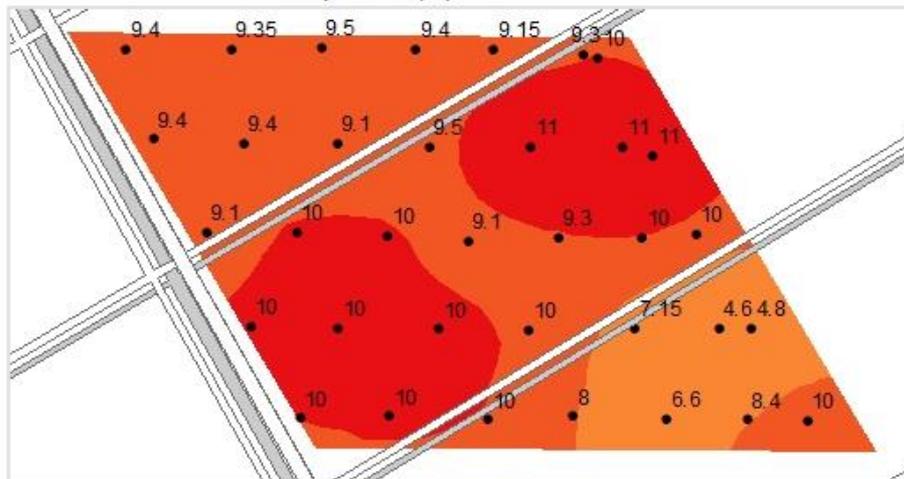
MAP MAP PEAT DEPTH



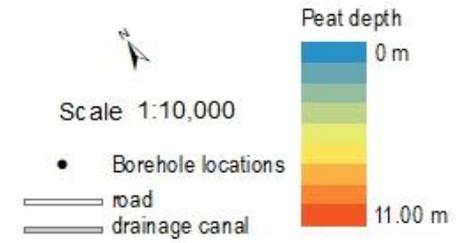
Deep area (B)



Shallow area (C)



Very deep area (A)



RESULTS of vlf data analysis

1. There is a statistically significant difference in resistivity between peat area.
2. There is a statistically significant difference in resistivity between:
 - area A (very deep peat area) and the area C (shallow deep area).
 - But, there is no differences between:
 - area A (very deep peat) and area B (deep peat)
 - area C (shallow peat) and area B (deep area).
3. There is a statistically significant difference in resistivity between group of depth in all of areas.

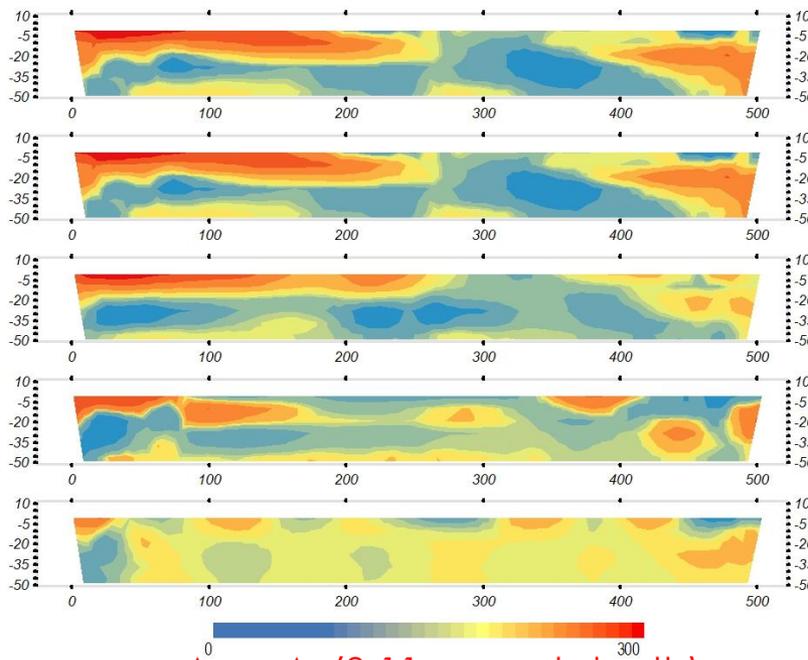
The Resume of Tukey Significances of peat resistivity ($\Omega.m$) between areas and the depth

| No | Depth | Very deep peat (8-11 m) | Deep peat (3-8 m) | Shallow peat (0-3 m) |
|----|----------|----------------------------|----------------------|-------------------------|
| 1 | -0.80 m | 33.716 a | 39.941 a | 41.980 a |
| 2 | -2.58 m | 33.968 a | 37.485 a | 40.258 a |
| 3 | -4.72 m | 30.750 ab | 32.815 ab | 35.284 ab |
| 4 | -7.32 m | 26.009 abc | 28.595 c | 28.014 c |
| 5 | -11.46 m | 25.062 cd | 25.477 cd | 24.967 c |
| 6 | -17.78 m | 21.571 de | 22.934 de | 21.919 cd |
| 7 | -26.19 m | 14.808 f | 16.896 f | 16.611 de |
| 8 | -49.33 m | 18.583 efg | 17.581 efg | 16.891 def |

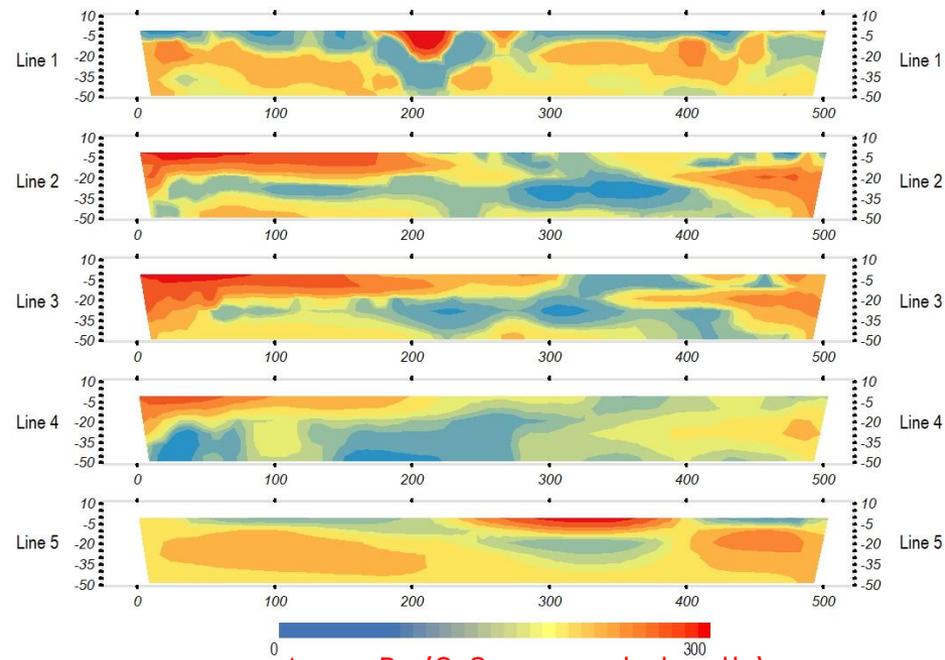
There is no significant difference in resistivity until the depth of -11.46 m

There is no significant difference in resistivity until the depth of -7.32 m

There is no significant difference in resistivity until the depth of -7.32 m

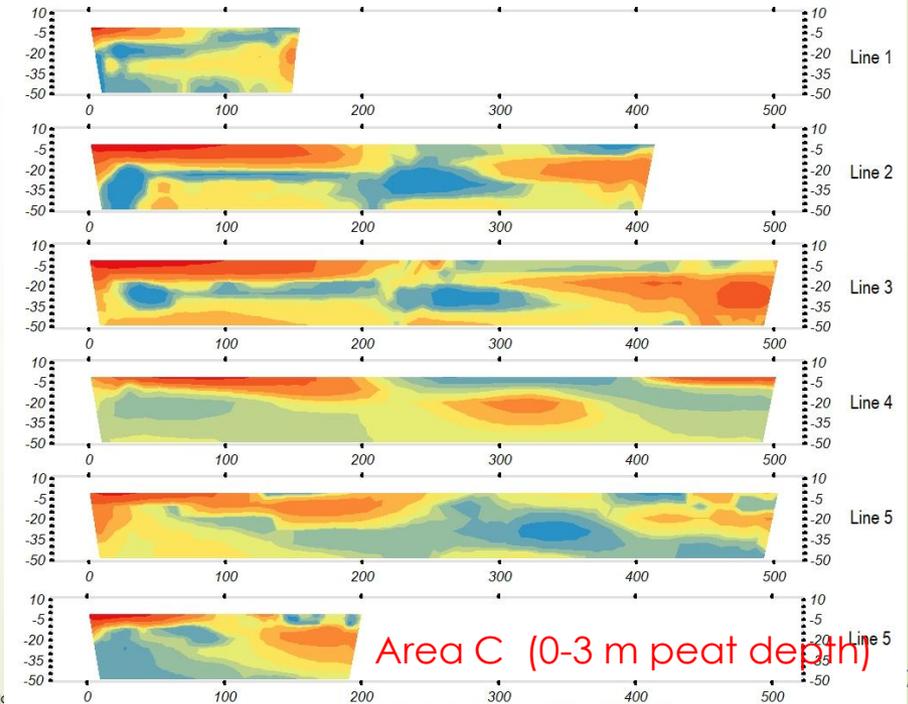


Area A (8-11 m peat depth)



Area B (3-8 m peat depth)

The map of vertically interpolated resistivity in each lines

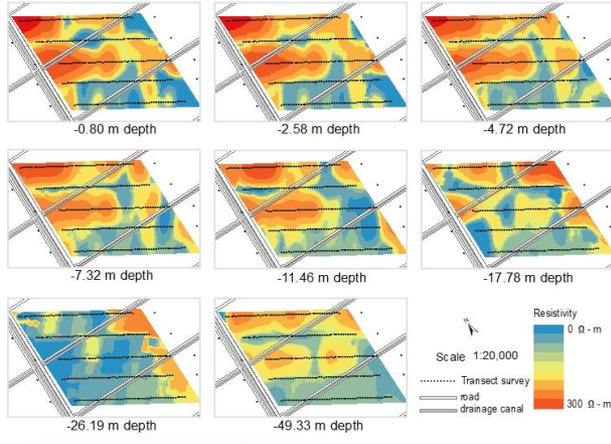


Area C (0-3 m peat depth)

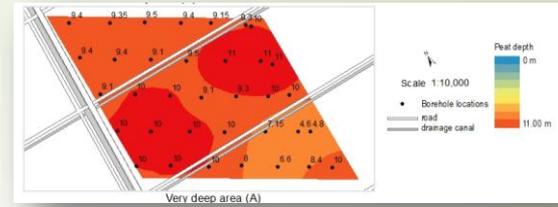


MAP COMPARISON

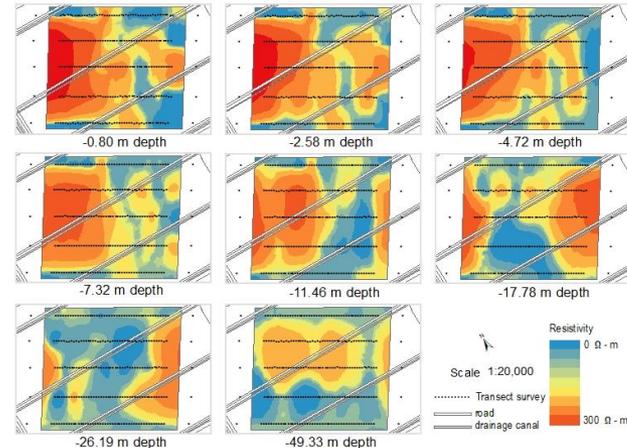
Predicted resistivity from VLF method



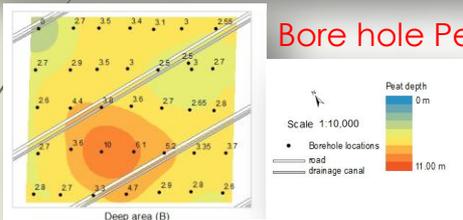
Bore hole Peat depth



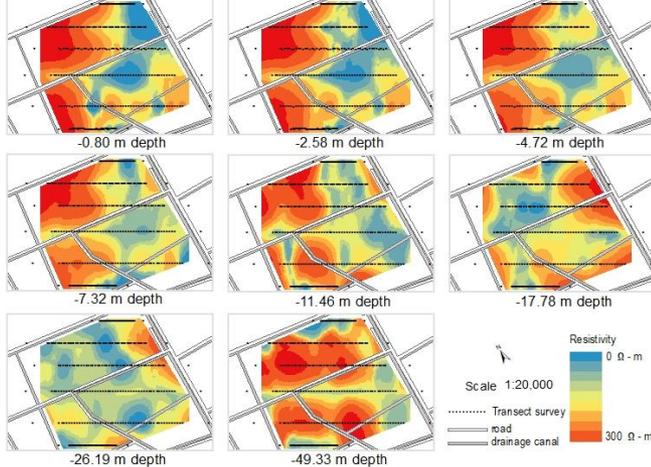
Predicted resistivity from VLF method



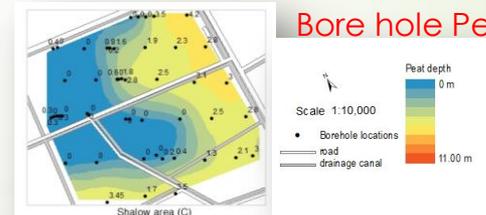
Bore hole Peat depth



Predicted resistivity from VLF method



Bore hole Peat depth



No correlation between predicted resistivity from VLF method and The borehole-measured peat depth

Conclusions:

VLF shows its capability to distinguish the variability between group of peat area especially between very deep peat and shallow peat.

The vertical resistivity of peat from VLF Method, tends to vary as the variation of peat depth.

However, VLF method can not certainly distinguish horizontal variation, Therefore can not be used to map peat depth variability

There is no publication yet, but will be publish soon, this is part my PhD research

THANK YOU

والسلام عليكم ورحمة الله وبركاته

May the peace, mercy, and blessings of Allah be with you