



## Research projects of counterparts funded at UNJA

Name	Counterpart	Title
<b>Mohd. Zuhdi, M. Edi Armanto, Sungkono Hening</b>	<b>B05</b>	Exploring peat spatial variability using very low frequency electromagnetic waves

### Background and Methods

This research evaluates a new method of mapping and measuring peat spatial variability by means of Very Low Frequency Electromagnetic (VLF-EM) radio waves as an alternative to boreholes (figure 1). The research location was a peatland in Seponjen Village, Sub District of Kumpeh, Muaro Jambi District, Jambi Province of Indonesia. The research areas had different depths of peat; A) very deep peat (8–15m), B) deep peat (3–8m) and C) shallow peat (0–3m).

### Result

#### BOREHOLE

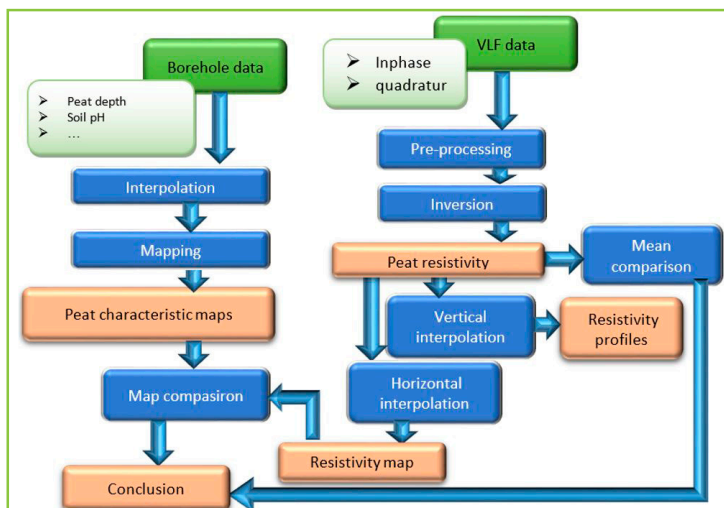
Peat depth tends to increase as the distance from the main river increases. Depth is anisotropic with respect to the river (figure 2).

#### VLF-EM

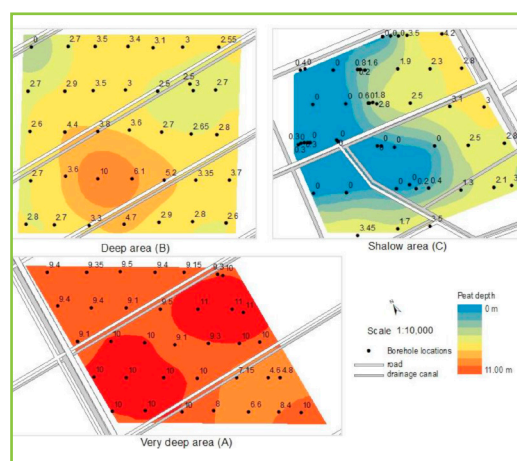
The resistivity tends to decrease with depth (data not shown here, see ABS report 2017). The mean comparison shows a statistically significant difference between the area of very deep peat and the area of shallow peat. However, there were no differences between the area of very deep peat and the area of deep peat. The depth in which resistivity start to be different tends to follow the depth of peat. In the area of very deep peat, the resistivity is similar (statistically not different) until a depth of -7.32m. This is equal to the depth of peat in this area. In the deep peat area, however, resistivity is similar until -4.72m. This is also equal to the depth of the peat (figure 3).

### Conclusion

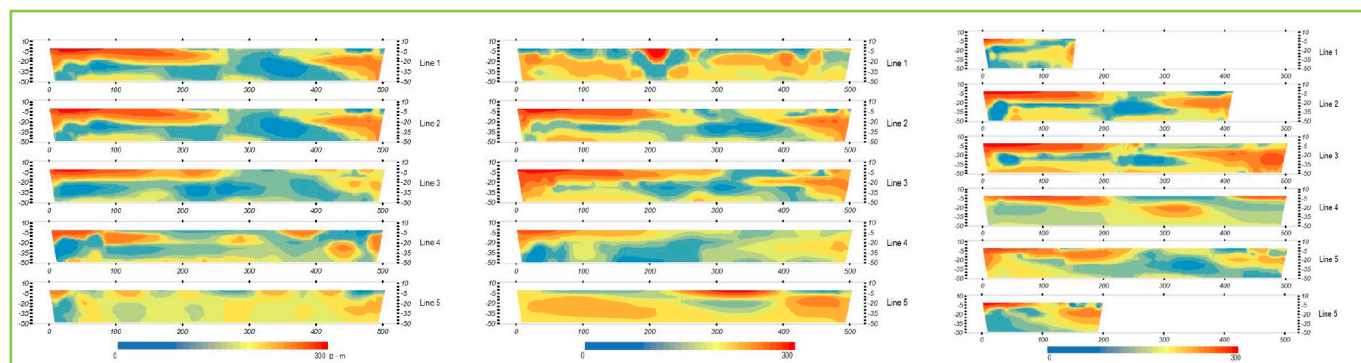
VLF method can be apply to distinguish different depth of peat, but cannot be used to map peat depth spatial distribution.



**Figure 1.** Flow-chart diagram outlining the data analysis of the borehole based observation and the VLF-EM method.



**Figure 2.** Maps of peat depth interpolated from borehole data in three areas: deep area (B, top left), shallow area (C, top right), and very deep area (A, bottom).



**Figure 3.** Resistivity profiles in three peat areas; very deep (left), deep (middle) and shallow (right).