SHAPE INDEX COMPARISON BETWEEN OBJECT-BASED CLASSIFICATION AND VISUAL INTERPRETATION FOR LAND COVER MAPPING USING QUICKBIRD MULTISPECTRAL PAN-SHARPERNED IMAGERY

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ABSTRACT

Object-based classification is a classification method that has begun to develop in remote sensing. This method not only developed a classification based on the value of the spectral information contained in each pixel on the satellite imagery, but also information arranged of a set of pixels that make up a specific the object. On high spatial resolution imagery, like Quickbird© imagery, this method is expected to match the ability of visual interpretation, in which and visual interpretation method is still the most accurate method in providing information. One of the factors to be considered when using object-based classification is the shape of the object on the classification results. This research compares the shape of the object between the object-based classification and visual interpretation.

Keywords: object-based classification, visual interpretation, land cover, Quickbird

INTRODUCTION

This Object-based classification is a classification in the remote sensing method that started growing rapidly. This classification has the ability which not only consider the spectral information contained in each pixel in the image, but also the object arranged of a collection of pixels that are inside.

One of the advantages of object-based classification compared to the pixel-based classification is the method can identify the object not only of the value of pixels, but also the size, shape, and texture. This method is more approach the capabilities of visual interpretation compared to the pixel-based classification, where the pixel-based classification only the element of tone / color in recognizing the object.

Due to the ability to identify the shape is one of the advantages of object-based classification, it is necessary to study how accurate the resulting shape when compared to visual interpretation.

MATERIALS AND METHODS

Quickbird Imagery

This research will use Quickbird multispectral pan-sharpened imagery that spatial resolution is up to 0.6 meter. Location of the study will be taken from most areas in West Semarang, taking into account variations in land cover the object contained in that area.

Figure 1. Quickbird Imagery

Methods

For the classification of land cover using two methods, the first is using object-based classification as the object of study, and visual interpretation as reference data for comparison. For comparison uses the index shape, in which there are some parameters to be used.

First method of classification uses object-based classification, which uses multiresolution segmentation algorithm in processing. Multiresolution segmentation consists elements of shape, color, size, and compactness. The classification will be performed multilevel, where the first step is to distinguish the object generally, which is between vegetation and non-vegetation. Then from each class were classified again into more detail. For non vegetation classified into residential, empty land, roads, water bodies, ponds, and embankment. As for vegetation classified into woody vegetation and grass / shrubs. On each stage will using configuration of different parameters, by adjusting the characteristics of the object to be identified.

Second method of classification uses visual interpretation. Visual interpretation will be done by digitizing the object based on land cover classes. Land cover classes used equated with object-based classification so that it can be compared. Scale used will be adjusted, so that the level of detail can be compared the results.

Methods to compare the results is to ride to overlay both the classification results, then the results will overlay obtained an overall accuracy of classification results. The assumptions used are the the results visual interpretation approach the original condition, so it can be used as reference data.

RESULTS AND DISCUSSION

Results of object-based classification compared with interpretation only reaches 66.13%. Many factors that led not too high value of accuracy obtained. The results of object-based classification shows that the object is still following restrictions pixel geometry, where there are still many boundaries are not smooth. Meanwhile, on the visual interpretation tends to be more subtle, because done manually, so regardless of the pixel geometry.

Figure 2. Object-based Classification Result

Figure 2. Visual Interpretation Result
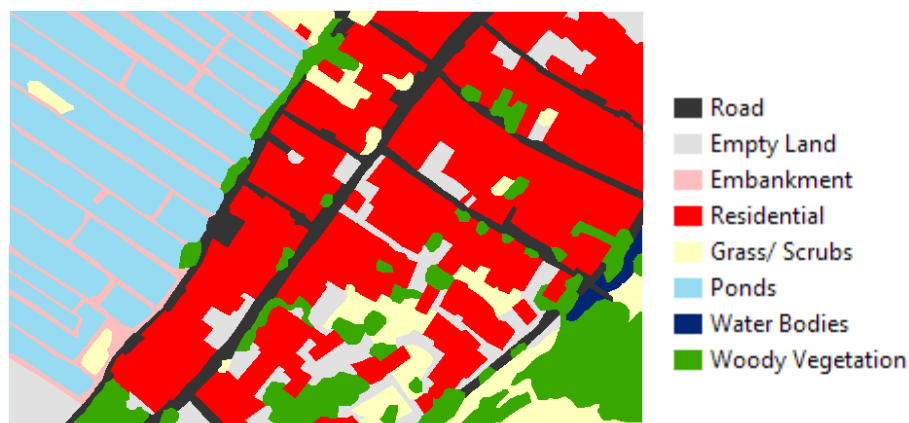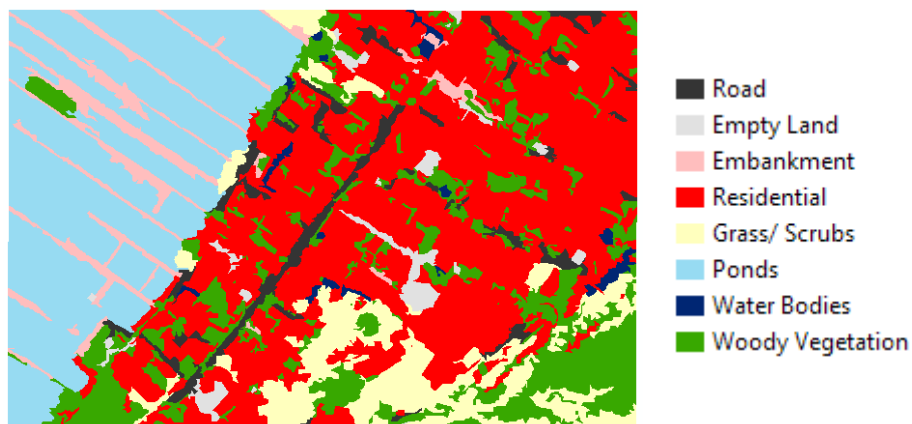
Apart from the factor of pixel geometry, the parameters used in both classification also determines the quality of the results. On object-based classification, a lot of parameters that can used during classification, so that the selection of the right parameters will be crucial, because it determines the quality of classification results. Meanwhile, the classification with visual interpretation was also influential, such as the level of detail in performing digitization, if not at the same level of detail with object-based classification results, it will provide data that can not be compared.Only material pertinent to the subject may be included. Data should not be repeated in figures and tables. The Discussion should interpret the results in view of the problem as outlined in the introduction and place the results within the context of the broad scientific study of the discipline.

Value of 66.13% is obtained from the calculation of the vast objects with the same information from both methods, and then divided by the total area. Results of object-based classification in raster format, so it needs to be converted in a vector format to be compared with the results of visual interpretation. Once converted, then be overlaid and calculated the extent.

Table 1. Accuracy Calculation

Result (in meter^2)	Result is same	Result is not the same	Total
	19782,37135	38616,74402	58399,11537
Accuracy			66,12556333 %

CONCLUSION

The results of object-based classification of land cover classification result is quite good, with the results 66.13% when compared to visual interpretation. From this it can be seen that there is need for study of object-based classification so the results obtained can match the quality of visual interpretation. Object-based classification is a potential, where many parameters that can be changed, so that the the results of the classification can be optimized further..

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