

# Quantitative Image Classification Accuracy Assessment Program for Sustainable Geospatial Technology Applications

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## SUMMARY

Image classification is an important operation in remotely sensed data analysis. It involves the extraction of identified features and features of interest into themes or classes. The final map resulting from classification exercise is called thematic map. Both the raw data and final output – thematic maps are susceptible to machine and human errors. Therefore, the level at which a classified map represents the reality it portrays remains uncertain until its accuracy is determined. Accuracy assessment is the measurement of the rate and level to which classified image agrees with the reference (ground) data it represents. Accuracy of any image classification may be tested in four different ways - field checks at selected points, map overlays, statistical analysis of numerical data, and using confusion matrix calculations. The confusion matrix is the most widely used measure of image classification accuracy assessment. It is a simple cross-tabulation of the mapped class label against the observed in the ground or reference data for a sample set. Several measures of classification accuracy may be derived from a confusion matrix, this include, overall accuracy, producer's accuracy, user's accuracy, and Kappa co-efficient. In many studies, quantitative assessment of the accuracy of classification is often avoided due to the rigorous statistical methods involved. Development of standard computer applications eases the task of accuracy assessment. This paper presents the development and application of the Quantitative Image Classification Accuracy Modeling and Assessment Program (QiMAP). QiMAP was developed using the Microsoft Visual Basic 6.0 programming language for research and academic purpose. The program was used in evaluating the classification accuracy of data used in the analysis of land use/land cover pattern along river Benue channel in Adamawa state, Nigeria. The results revealed a system that simplifies the task of accuracy assessment of image classification. The paper conclude that to ensure a reliable application of geospatial technology - remote sensing, image classification accuracy assessment should be consider as prerequisite for acceptability of any thematic map derived from remote sensing data analysis. And the development of standard applications such as QiMAP would accelerate the appraisal of accuracy assessment for image classification.