Assessing pixel versus object-based image classification and potential use cases’

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SUMMARY

Objective□The classification of features from imagery is becoming increasingly prevalent amongst the spatial and remote sensing community due to the ease of extraction, which previously would have been a largely manual task. However, as more methods become available, it is difficult to ascertain which method would be the best solution to a particular classification task. This work investigated the differences between pixel and object-based classification and which scenarios would benefit from one method over the other. □Method□The rasters that were used for investigation were large patches of landscape containing large quantities of vegetation (isolated and clustered), waterbodies, cleared land and infrastructure. Pixel-based classification examines the pixel values of the imagery and classifies each pixel as determined by the pixels within the training sample. Object-based classification examines the clusters of pixels, and how the cluster size, shape and colour reflect those within the training sample. A limiting factor with both methods is evidently the training sample, as the training sample requires enough coverage of each pixel or cluster so the models can confidently classify each feature. □Results□Yearly change assessments of a specific area would best benefit from object-based classification as the objective of the task is to assess the change of the objects.□Developing a classification to suit many isolated areas within a region would be better suited for pixel-based classification as the training data would include the range of pixels found within the region, regardless of shape and size of pixel clusters as they may change.□Conclusion□In conclusion, when selecting a classification method for a specific task, it is essential to consider the task's objective, as no single method works universally for all scenarios. Additionally, whichever classification method is selected, the quality of results relies heavily on a quality training sample dataset.