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Geographic Object-Based Image Analysis “Towards a new paradigm

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Abstract

The amount of scientific literature on (Geographic) Object-based Image Analysis “GEOBIA has been and still is sharply increasing. These approaches to analysing imagery have antecedents in earlier research on image segmentation and use GIS-like spatial analysis within classification and feature extraction approaches. This article investigates these development and its implications and asks whether or not this is a new paradigm in remote sensing and Geographic Information Science (GIScience). We first discuss several limitations of prevailing per-pixel methods when applied to high resolution images. Then we explore the paradigm concept developed by [Kuhn \(1962\)](#) and discuss whether GEOBIA can be regarded as a paradigm according to this definition. We crystallize core concepts of GEOBIA, including the role of objects, of ontologies and the

multiplicity of scales and we discuss how these conceptual developments support important methods in remote sensing such as change detection and accuracy assessment. The ramifications of the different theoretical foundations between the $\hat{\epsilon}$ per-pixel paradigm $\hat{\epsilon}^{\text{TM}}$ and GEOBIA are analysed, as are some of the challenges along this path from pixels, to objects, to geo-intelligence. Based on several paradigm indications as defined by Kuhn and based on an analysis of peer-reviewed scientific literature we conclude that GEOBIA is a new and evolving paradigm.



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Keywords

GEOBIA; OBIA; GIScience; Remote sensing; Image segmentation; Image classification

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