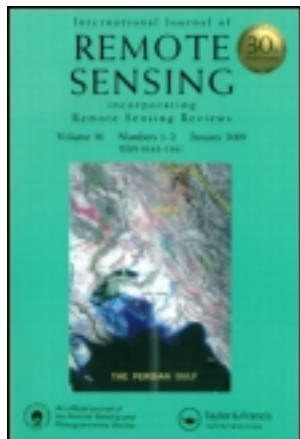


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Use of normalized difference built-up index in automatically mapping urban areas from TM imagery

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Use of normalized difference built-up index in automatically mapping urban areas from TM imagery

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Abstract. Remotely sensed imagery is ideally used to monitor and detect land cover changes that occur frequently in urban and peri-urban areas as a consequence of incessant urbanization. It is a lengthy process to convert satellite imagery into land cover map using the existing methods of manual interpretation and parametric image classification digitally. In this paper we propose a new method based on Normalized Difference Built-up Index (NDBI) to automate the process of mapping built-up areas. It takes advantage of the unique spectral response of built-up areas and other land covers. Built-up areas are effectively mapped through arithmetic manipulation of re-coded Normalized Difference Vegetation Index (NDVI) and NDBI images derived from TM imagery. The devised NDBI method was applied to map urban land in the city of Nanjing, eastern China. The mapped results at an accuracy of 92.6% indicate that it can be used to fulfil the mapping objective reliably. Compared with the maximum likelihood classification method, the proposed NDBI is able to serve as a worthwhile alternative for quickly and objectively mapping built-up areas.

1. Introduction

Land covers in urban areas tend to change more drastically over a short period of time than elsewhere because of incessant urbanization. Urbanization has led land covers to change especially frequently in peri-urban areas in China as a result of rapid economic development. These changes are ideally monitored and detected from remotely sensed images as they are relatively up-to-date and give a panoramic view.

Remote sensing materials in the form of aerial photographs and satellite images are usually converted into useful information such as land cover maps using two

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