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OBJECT-BASED CHANGE DETECTION USING HIGH-RESOLUTION REMOTELY SENSED DATA AND GIS

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Abstract. High resolution remotely sensed images provide current, detailed, and accurate information for large areas of the earth surface which can be used for change detection analyses. Conventional methods of image processing permit detection of changes by comparing remotely sensed multitemporal images. However, for performing a successful analysis it is desirable to take images from the same sensor which should be acquired at the same time of season, at the same time of a day, and – for electro-optical sensors – in cloudless conditions. Thus, a change detection analysis could be problematic especially for sudden catastrophic events. A promising alternative is the use of vector-based maps containing information about the original urban layout which can be related to a single image obtained after the catastrophe. The paper describes a methodology for an object-based search of destroyed buildings as a consequence of a natural or man-made catastrophe (e.g., earthquakes, flooding, civil war). The analysis is based on remotely sensed and vector GIS data. It includes three main steps: (i) generation of features describing the state of buildings; (ii) classification of building conditions; and (iii) data import into a GIS. One of the proposed features is a newly developed 'Detected Part of Contour' (DPC). Additionally, several features based on the analysis of textural information corresponding to the investigated vector objects are calculated. The method is applied to remotely sensed images of areas that have been subjected to an earthquake. The results show the high reliability of the DPC feature as an indicator for change.

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