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Change indexes accuracy evaluation for urban damage detection applications

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Application of remote sensing and image analysis are a relevant part in the process of study and understanding effects of natural and anthropogenic hazard. This topic moves forwards the scientific community to produce even more fast, reliable and accurate change detection procedure, with the aim to respond to an hazard in the immediate aftermath of an event (response phase) and also for documentation and inventory study for better understanding effect of future and past events (mitigation phase). The main scope of the work is the presentation, the discussion and the evaluation of change detection procedures based on change indexes; with the aim of evaluating also the effects in overall effectiveness of these algorithms by the change of resolution, the difference in illumination/angle of view, trying to present a matrix of influence of these image characteristics on the accuracy in this kind of application. Several case studies will be presented, concerning major earthquakes occurred in the last decade, as remote sensing imagery became available for urban change detection study, evaluating also the impact of very high resolution imagery, which are representing the state of art in the permitting an accurate study and a proper analysis of obtained results. Different satellite platforms will be taken into account, considering also the possibility of integrate and fuse satellite imagery at different spectral and geometric resolution.