

## **A change detection measure based on the number of connected components for flood detection in SAR Images**

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Detection of flooding from SAR images in an operational context remains a very challenging task. Fully automated, time efficient, accurate and stable flood extracting algorithms are scarce. This paper proposes a new automated change detection approach based on the number of connected components to detect floods in multi-temporal SAR images. At first, the difference image is derived from the log-ratio change detection measure by change detection between the flood and reference images. Since the backscatter values of water in SAR images are rather low and the flooded image is the denominator of the log-ratio change detection measure, flood areas in the difference image mainly correspond to regions with high intensity values and each region consists of several connected pixels showing high homogeneity. For this reason the number of connected components (NCC), derived by thresholding the difference image with different tested thresholds, has an obvious change trend: it drops off dramatically with lower thresholds, whereas it tends to reach a constant value with higher thresholds and it is almost constant within a wide threshold range. Analyzing this trend, we derive two thresholds. The larger threshold is used to get a mask of core water bodies and estimate parameters of flooded areas. The smaller threshold is used to get rid of the unchanged areas. Finally, a precision change detection result is derived. The experimental results with two pairs of SAR images show that the proposed automated algorithm is stable, fast and accurate.