

Unsupervised Land Cover Change Detection: Meaningful Sequential Time Series Analysis

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ABSTRACT

An automated land cover change detection method is proposed that uses coarse spatial resolution hyper-temporal earth observation satellite time series data. The study compared three different unsupervised clustering approaches that operate on short term Fourier transform coefficients computed over subsequences of 8-day composite MODerate-resolution Imaging Spectroradiometer (MODIS) surface reflectance data that were extracted with a temporal sliding window. The method uses a feature extraction process that creates meaningful sequential time series that can be analyzed and processed for change detection. The method was evaluated on real and simulated land cover change examples and obtained a change detection accuracy exceeding 76% on real land cover conversion and more than 70% on simulated land cover conversion.