



Assessing burn severity using satellite time series

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In this study a multi-temporal differenced Normalized Burn Ratio ($dNBR_{MT}$) is presented to assess burn severity of the 2007 Peloponnese (Greece) wildfires. 8-day composites were created using the daily near infrared (NIR) and mid infrared (MIR) reflectance products of the Moderate Resolution Imaging Spectroradiometer (MODIS). Prior to the calculation of the $dNBR_{MT}$ a pixel-based control plot selection procedure was initiated for each burned pixel based on time series similarity of the pre-fire year 2006 to estimate the spatio-temporal NBR dynamics in the case that no fire event would have occurred. The $dNBR_{MT}$ is defined as the one-year post-fire integrated difference between the NBR values of the control and focal pixels. Results reveal the temporal dependency of the absolute values of bi-temporal $dNBR$ maps as the mean temporal standard deviation of the one-year post-fire bi-temporal $dNBR$ time series equaled 0.14 (standard deviation of 0.04). The $dNBR_{MT}$'s integration of temporal variability into one value potentially enhances the comparability of fires across space and time. In addition, the $dNBR_{MT}$ is robust to random noise thanks to the averaging effect. The $dNBR_{MT}$, based on coarse resolution imagery with high temporal frequency, has the potential to become either a valuable complement to fine resolution Landsat $dNBR$ mapping or an imperative option for assessing burn severity at a continental to global scale.