The 36th International Symposium on Remote Sensing of Environment,
11 – 15 May 2015, Berlin, Germany, ISRSE36-233

# ESTIMATING SUB-PIXEL PATCHINESS OF WILDFIRES IN AUSTRALIA USING MODIS DATA AND A LINEAR UN-MIXING APPROACH

S. W. Maier [a, *]

[a] Charles Darwin University, Research Institute of the Environment and Livelihoods, Darwin, Northern Territory 0909, Australia – Stefan.Maier@cdu.edu.au

**THEME:** Forests, Biodiversity and Terrestrial Ecosystems - Session on "Remote Sensing of Wildfires".

**KEY WORDS:** MODIS, wildfires, Australia, patchiness, linear un-mixing

**ABSTRACT:**

In Australia wildfires are affecting between 300,000 and 700,000 km$^2$ every year. Therefore fire extent mapping has become a routine application for satellite remote sensing. However, fires differ strongly in their ecological impact, fraction of fuel consumed and amount of greenhouse gases released. An important variable required to estimate these factors is patchiness.
Recent research has shown that patchiness is occurring at a scale of only a few meters. Thus, assessing fire patchiness would require burnt area mapping at the meter scale. While this is feasible for small areas and individual small fires, it is not economical for large areas. Fortunately it is not important to know the exact location of small unburned patches. Consequently a method has been developed to estimate the fraction of a MODIS pixel burnt. The method utilises a linear un-mixing approach and daily MODIS observations. As the approach is based on physical principles it is ecosystem independent and does not require calibration with high resolution remote sensing data or field observations.
This paper presents the method developed and results of its application to the MODIS archive for Australia. Additionally implications of these results for fire management and greenhouse gas accounting will be discussed.

* Corresponding author. This is useful to know for communication with the appropriate person in cases with more than one author.