**ACRS 2014 Abstract**

**Landsat 8 investigation of peat fire detection in Sumatra: Preliminary results**

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**ABSTRACT**

Peat fires are notorious for their large smoke production, heavy release of greenhouse gases and persistence. These effects are the result of combustion in a low temperature smoldering phase, which makes their detection via satellite sensors challenging. In this paper we report results based on an analysis of daytime and nighttime Landsat 8 data, with validation from field collections of surface temperature data, for peat fires in Riau, Sumatra, Indonesia. The region has a history of peat fires, most recently in June, 2013 and March, 2014. Burning in a flaming phase is typically near 800K. In contrast, peat fire surface temperatures are about half of this (~400K). Background surface temperatures are approximately 300-310K. Planck curve modeling indicates the peat fires should be detectable based on anomalously high radiances in Landsat 8 spectral bands at 11.1 and 12 um (bands 10 and 11), but have negligible radiance in shorter wavelength bands. Examination of Landsat data collected during fire episodes indicated that flaming phase fires can be detected in both day and night Landsat 8 data at 2.2 um (band 7). Close examination of the pixel blocks having flaming phase detection reveals that in some cases there are coincident thermal anomalies in B10 and B11. The results confirm that peat fires can be detected in Landsat 8 data. Current efforts are focused on producing a standard set of algorithms for detecting flaming phase and peat fires in Landsat 8 data and intercomparison with data collected by the VIIRS instrument.