RAPID CHANGE LAND COVER.pdf

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RAPID LAND COVER CHANGE IN THE MERANG KEPAHYANG PEAT HYDOLOGICAL REGION, SOUTH SUMATRA, INDONESIA ASSOCIATED WITH PEAT FIRE

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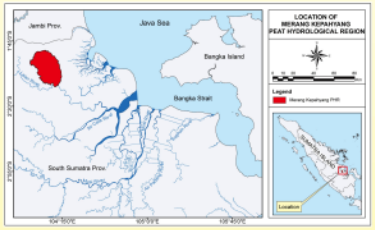
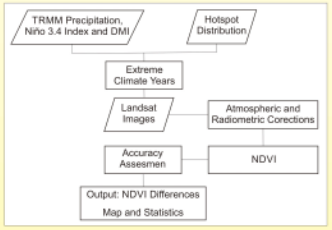
ABSTRACT

Peat fires is one of a serious environmental issue in Indonesia, in particular in the South Sumatra region. The fires usually occur during dry season from July to September. This study is designed to evaluate the impact of peat fires on land cover change in the Merang Kepahyang Peat Hydrological Region (MK-PHR) in the South Sumatra using Landsat satellite imagery for period of 2002 – 2015. The Normalized Difference Vegetation Index (NDVI) was used an index to calculate the density of green on patch of land (land cover). The results showed that extreme peat fires associated with anomalous climate events were occurred in 2006, 2012 and 2015. In particular, the 2015 peat fires associated with the largest anomalous climatic index had the largest hotspot distribution and the rapid land cover changes were observed in the most area of the MK-PHR. The total average of land cover loss was about 49% of the total MK-PHR area.

INTRODUCTION

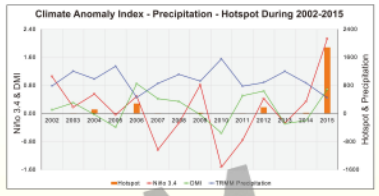
DATA AND METHOD

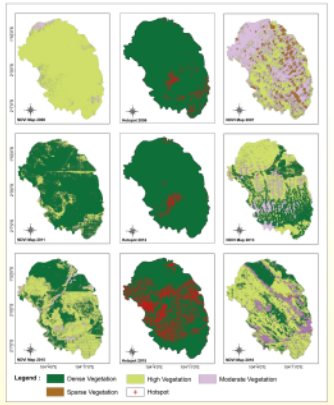




Data	Record Time	Source
Hotspot	2002-2015	*http://firms.modaps.eosdis.nasa.gov*
Niño 3.4 Index	2002-2015	*http://ioc-goosoopc.org*
Dipole Mode Index (DMI)	2002-2015	*http://ioc-goosoopc.org*
TRMM Precipitation	2002-2015	*https://mirador.gsfc.nasa.gov*
Landsat 5 Image (Patch 125;062)	08/06/2006; 26/05/2007; 02/03/2011; 27/06/2013	*https://ers.cr.usgs.gov*
Landsat 8 Image (Patch 125;062)	03/07/2015; 06/08/2016	*https://ers.cr.usgs.gov*

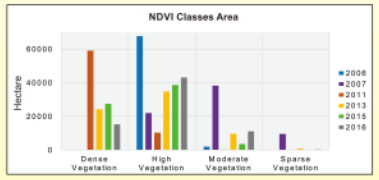
RESULT

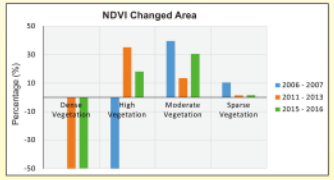




NDVI Density Classes	NDVI Classes Area (Hectare)					
	2006	2007	2011	2013	2015	2016
Dense Vegetation	0	0	59179	24325	27469	15324
High Vegetation	67780	22019	10311	34795	38708	43116
Moderate Vegetation	2052	38260	340	9734	3642	11054
Sparse Vegetation	4	9549	2	975	10	368

NDVI Density Classes	Changed Area (%)		
	2006 - 2007	2011 -2013	2015 - 2016
Dense Vegetation	0.00	-50.00	-49.93
High Vegetation	-50.00	35.13	18.12
Moderate Vegetation	39.57	13.48	30.47
Sparse Vegetation	10.43	1.40	1.47





CONSLUSION

Climate anomaly totally affects the total hotspot in the study area. It's evidenced by increasing of hotspot amount when the anomaly index has a high rate and precipitation has a low rate. Based on the result, the changes of land cover occurs at hotspot distribution areas and surrounding. Changes in vegetation density levels occurring outside the hotspot distribution area are thought to be due to crop adaptation to climatic conditions that result in green matter declining. The land cover changes due to fires occurred negatively, in which the high-density vegetation class moved to the lower class. The year of 2015 has the highest rate of anomaly index with the biggest score of a hotspot and the land cover changed occurred in most of MK-PHR area.

ACKNOWLEDGEMENT

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PRIMARY SOURCES

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