

Table 1: Specifications of MODIS bandwidths. Shaded bandwidths were used in this study, either individually or as part of the MIRBI index.

Bandwidth	Band Number	Spatial Resolution	Wavelength Range (μm)
Red	1	250 m or 500 m	0.62-0.67
NIR	2	250 m or 500 m	0.841-0.876
Blue	3	500 m	0.459-0.479
Green	4	500 m	0.545-565
LNIR	5	500 m	1.23-1.25
SMIR	6	500 m	1.628-1.652
LMIR	7	500 m	2.105-2.155

Table 2: Dates of TM imagery that were used to generate an error matrix for each classification scenario, and the date of the corresponding classification scenarios. Path/Row identifies the location of each scene on the Worldwide Reference System II grid.

Path/Row	TM Image	MODIS Image
28/33	4/2/2008	4/2 (Aqua)
27/33	4/27/2008	4/28 (Terra)
28/33	5/4/2008	5/4 (Aqua)
28/33	5/20/2008	5/20 (Aqua)
28/33	4/8/2010	4/9 (Terra)
27/33	4/17/2010	4/17 (Aqua)
27/34	5/3/2010	5/4 (Terra)

Table 3: Characteristics of the ground-truth burned areas used in this study. Date burned is an estimate based on MODIS imagery. The last two columns indicated the number of pixels in an area the size of each burn at the given spatial resolution.

2008	Burn Date	Size (ha)	250 m	500 m
Burn #1	4/2	89	14	4
Burn #2	4/2	88	14	4
Burn #3	4/2	224	36	9
Burn #4	4/1	633	101	25
Burn #5	4/1	744	119	30
Burn #6	4/2	46	7	2

2010	Burn Date	Size (ha)	250 m	500 m
Burn #1	4/10-4/11	958	153	38
Burn #2	4/11	128	20	5
Burn #3	4/10	182	29	7
Burn #4	4/9	126	20	5
Burn #5	4/9	120	19	5
Burn #6	4/17	76	12	3
Burn #7	4/14	128	20	5
Burn #8	4/9	125	20	5
Burn #9	3/31	45	7	2
Burn #10	4/9	128	20	5
Burn #11	4/9	45	7	2
Burn #12	4/9	31	5	1

Table 4: Thresholds and dates of MODIS imagery used to generate the two masks. Purpose column indicates the target land cover type masked by each threshold, though additional, non-grassland cover types were often masked as well. Values are given in reflectance.

3/1/2008	Purpose
NIR < 0.18	Water
Red < 0.11	Active Crop

7/14/2008	Purpose
Red > 0.10	Fallow Crop
NIR < 0.28	Water
NIR > 0.48, Red < 0.045	Active Crop

Table 5: Scenarios used as classification inputs in this study and their component bands/indices.

Name	Components	Spatial Resolution (m)
1	NIR	250
2	Red	250
3	LNIR	500
4	MIRBI	500
5	MIRBI, LNIR, red, NIR	500
6	red, NIR	250
7	Bands 1-7	500

Table 6: Number of ground-truth points falling into the burned and unburned classes based on visual interpretation of TM imagery.

TM Image	Burned	Unburned	Total
4/2/2008	21	91	112
4/27/2008	61	42	103
5/4/2008	75	35	110
5/20/2008	87	26	113
4/8/2010	26	83	109
4/17/2010	58	58	116
5/3/2010	85	40	125

Table 7: *KHAT* estimates for all image dates for all scenarios used in this analysis. Unrealistically low numbers, marked by an asterisk, occurred when striping was present on the LNIR band and affected the minimum distance classification.

Scenario #	1	2	3	4	5	6	7
2008 Minimum Distance <i>KHAT</i>							
4/2	0.84	0.88	0.81	0.66	0.84	0.84	0.81
4/27	0.80	0.84	0.61	0.74	0.73	0.90	0.74
5/4	0.79	0.83	0.48	0.59	0.62	0.89	0.63
5/20	0.11	0.53	0.29	0.31	0.28	0.23	0.25
2008 Object-Based <i>KHAT</i>							
4/2	0.88	0.81	0.82	0.63	0.91	0.84	0.85
4/27	0.42	0.54	0.55	0.61	0.65	0.76	0.78
5/4	0.60	0.22	0.46	0.45	0.74	0.52	0.62
5/20	0.18	0.25	0.27	0.12	0.46	0.45	0.34
2010 Minimum Distance <i>KHAT</i>							
4/8	0.81	0.82	0.19*	0.76	0.40*	0.81	0.55*
4/17	0.83	0.86	0.67	0.59	0.74	0.91	0.69
5/3	0.60	0.46	-0.03*	0.66	-0.02*	0.72	-0.01*
2010 Object-Based <i>KHAT</i>							
4/8	0.82	0.57	0.73	0.76	0.77	0.84	0.78
4/17	0.84	0.57	0.67	0.57	0.72	0.93	0.76
5/3	0.48	0.30	0.63	0.55	0.63	0.73	0.46

Table 8: Consecutive days where at least 80% of each burned area was detected by each scenario using the minimum distance technique (A) or object-based classification technique (B). Max is the potential number of days to which this might extend had a daily imagery sample been possible. Question marks indicate that > 80% was detected through the end of the sampling period.

A		# 1		# 2		# 3		# 4		# 5		# 6		# 7	
2008	Area (ha)	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max
Burn #1	89	12	13	49	?	0	0	0	0	1	4	12	13	1	4
Burn #2	88	0	0	5	11	0	0	18	20	0	0	1	4	0	0
Burn #3	224	5	11	49	?	0	0	0	0	0	0	33	39	0	0
Burn #4	633	29	33	49	?	2	5	28	28	15	18	47	49	29	33
Burn #5	744	29	33	49	?	6	12	0	1	47	49	47	49	47	49
Burn #6	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010															
Burn #1	958	31	72	31	72	9	18	9	18	9	18	31	72	9	24
Burn #2	128	73	?	73	?	0	3	0	3	0	3	73	?	0	3
Burn #3	182	25	25	32	73	0	4	0	4	0	4	74	?	0	4
Burn #4	126	1	5	33	74	0	0	0	0	0	0	9	10	11	20
Burn #5	120	9	10	33	74	0	0	0	0	0	0	9	10	0	0
Burn #6	76	0	0	3	12	3	12	1	2	3	12	0	0	3	12
Burn #7	128	70	?	28	69	16	20	70	?	16	20	70	?	16	20
Burn #8	125	75	?	33	74	0	0	0	0	0	0	75	?	0	0
Burn #9	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burn #10	128	1	5	75	?	0	0	0	0	0	0	11	20	0	0
Burn #11	45	6	8	75	?	21	25	6	8	21	25	6	8	21	25
Burn #12	31	11	20	75	?	11	20	6	8	11	20	21	25	21	25

B		# 1		# 2		# 3		# 4		# 5		# 6		# 7	
2008	Area (ha)	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max	Days	Max
Burn #1	89	5	11	14	17	1	4	0	0	1	4	5	11	1	4
Burn #2	88	5	11	1	4	0	0	1	4	1	4	1	4	1	4
Burn #3	224	32	39	14	17	0	0	0	0	0	0	14	17	0	0
Burn #4	633	33	40	50	?	2	5	20	21	41	46	1	1	2	5
Burn #5	744	33	40	19	21	0	0	0	0	41	46	47	49	22	27
Burn #6	46	0	0	1	4	1	4	0	0	1	4	0	0	5	11
2010															
Burn #1	958	31	72	9	18	9	18	9	18	9	18	31	72	9	18
Burn #2	128	25	25	73	?	0	3	0	3	0	3	73	?	0	3
Burn #3	182	10	19	0	4	0	4	0	4	5	7	74	?	0	4
Burn #4	126	9	10	6	8	0	0	0	0	0	0	33	74	1	5
Burn #5	120	11	20	21	25	0	0	0	0	0	0	0	0	0	0
Burn #6	76	1	2	3	12	3	12	1	2	3	12	1	2	3	12
Burn #7	128	70	?	16	20	70	?	24	27	70	?	28	69	70	?
Burn #8	125	75	?	1	5	0	0	0	0	0	0	32	74	0	0
Burn #9	45	0	0	0	0	0	0	0	0	0	0	18	19	0	0
Burn #10	128	1	5	1	5	0	0	0	0	1	5	0	0	1	5
Burn #11	45	26	26	1	5	29	32	6	8	33	74	27	27	75	?
Burn #12	31	11	20	1	5	11	20	6	8	11	20	21	25	75	?