

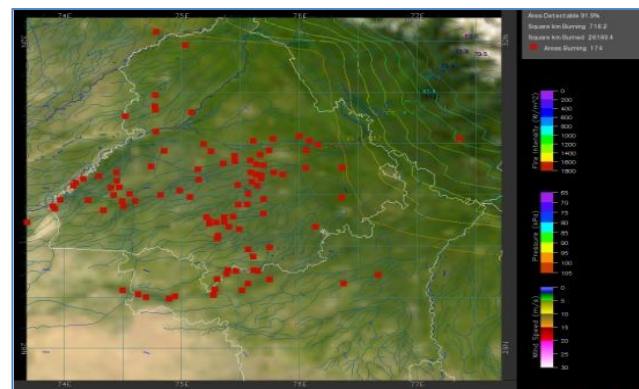
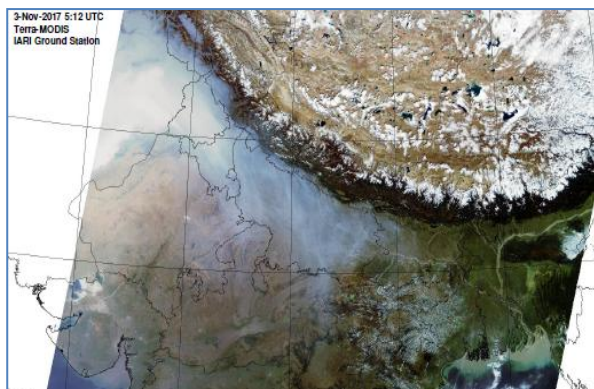


MONITORING PADDY RESIDUE BURNING IN NORTH INDIA USING SATELLITE REMOTE SENSING DURING 2018

**Bulletin
No. 9**

**Events Date:
09-Oct-2018**

**Issued on:
10-Oct-2018**



Prepared by:

**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

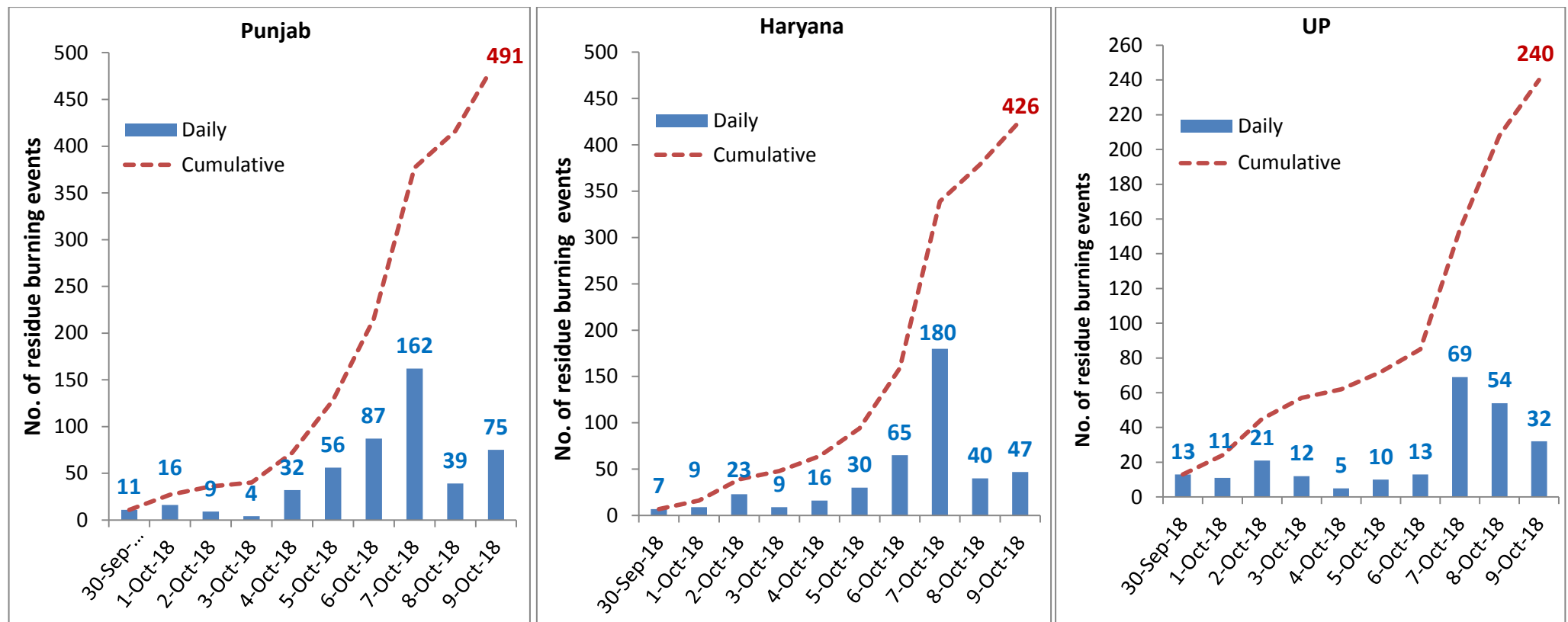
<http://creams.iari.res.in>



Highlights for 09-October-2018

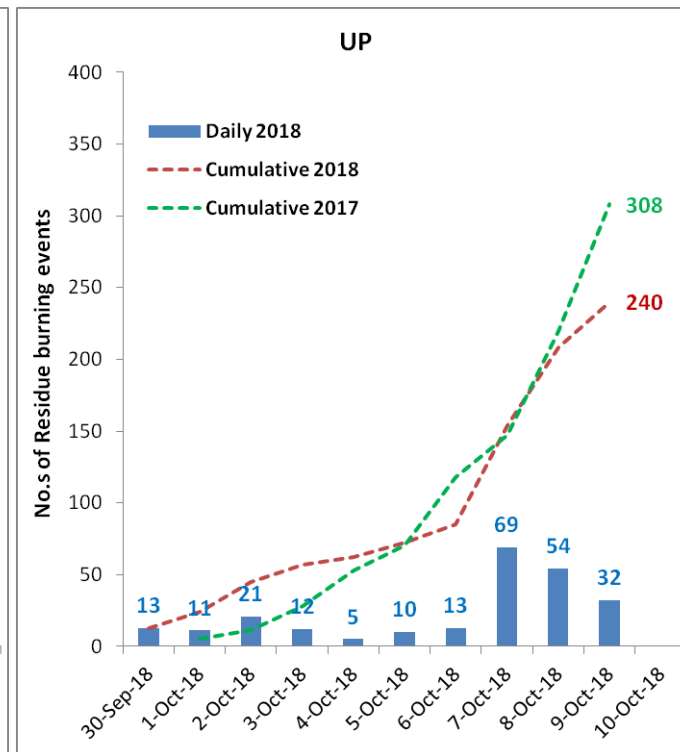
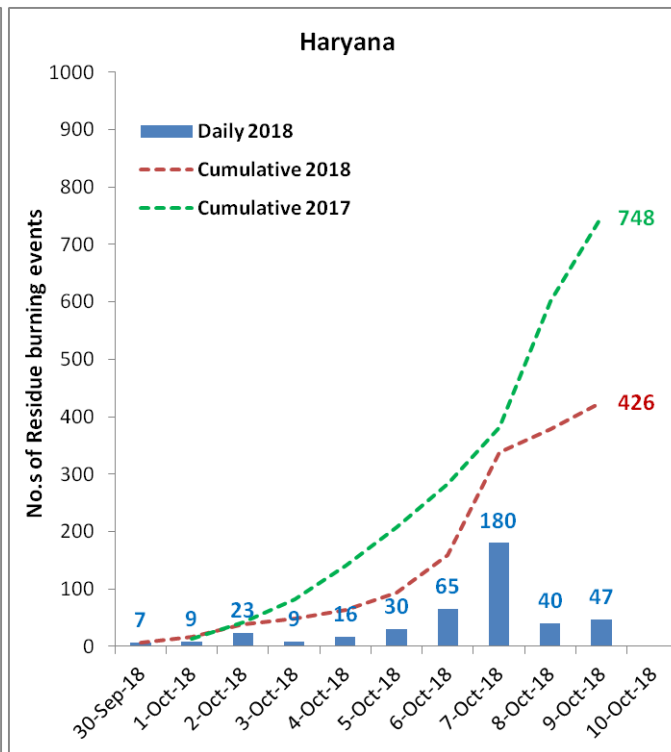
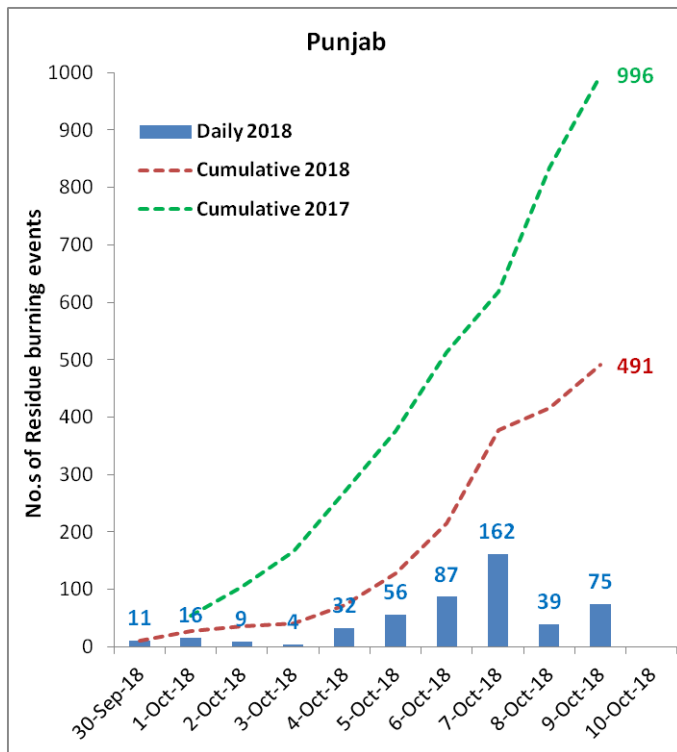
- Satellites detected 154 residue burning events in the three States (Punjab, Haryana & UP) on 09-Oct-2018.
- The burning events detected on 09-Oct-2018 are 75, 47 and 32 in Punjab, Haryana, and UP, respectively.
- The number of events increased slightly from 133 on 08-Oct-2018 to 154 on 09-Oct-2018 in the three States.
- Total 1157 burning events were detected in three States between 30-Sep-2018 and 09-Oct-2018, which were distributed as 491, 426 and 240 in Punjab, Haryana and UP, respectively.

Temporal distribution of residue burning events for the three study States



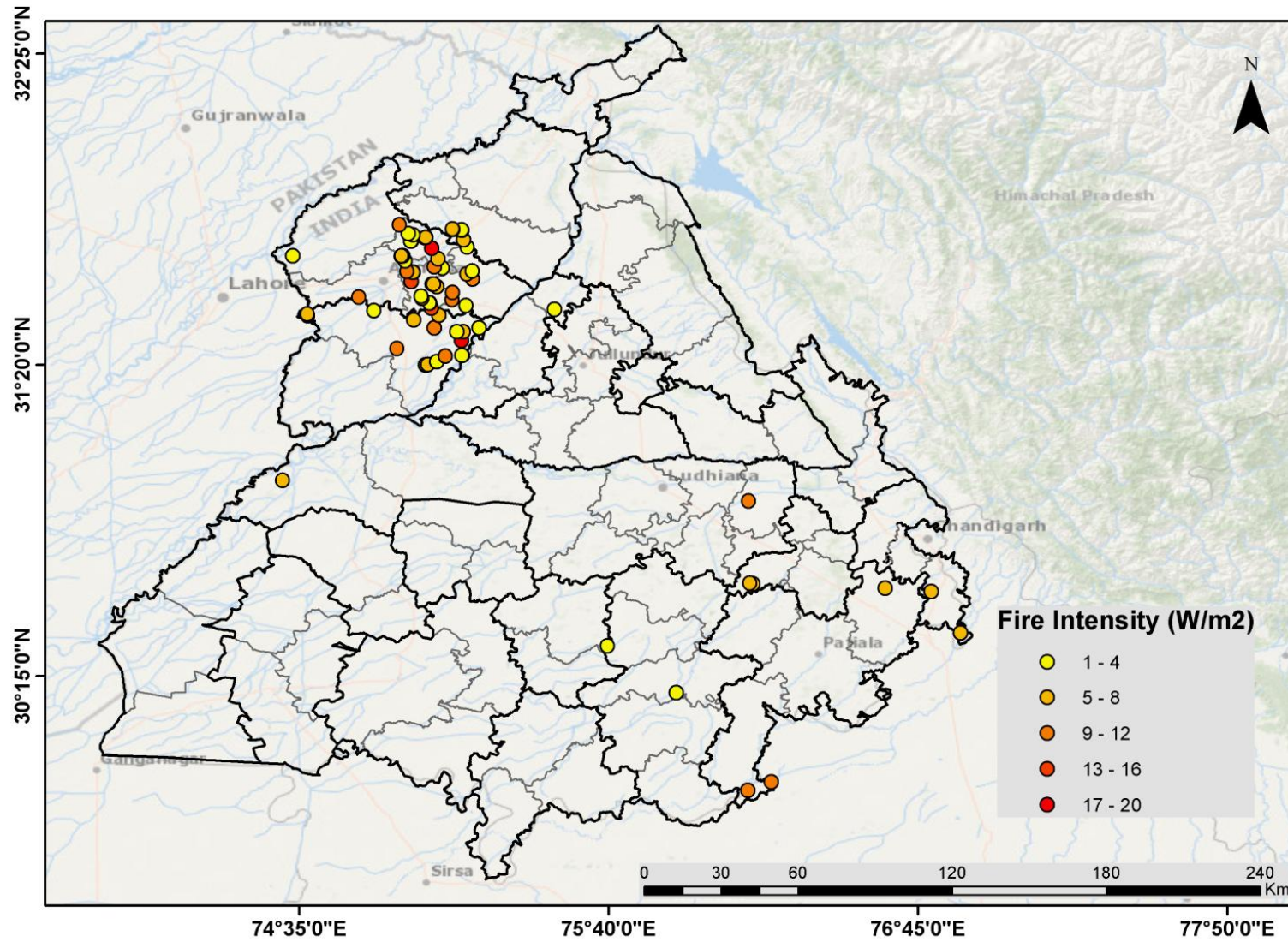
Comparison of residue burning events in current year (2018) with previous year (2017) for the three study States

(30-Sep-2018 to 09-Oct-2018)



(a) Punjab

Paddy Residue Burning in Punjab on 9th Oct 2018



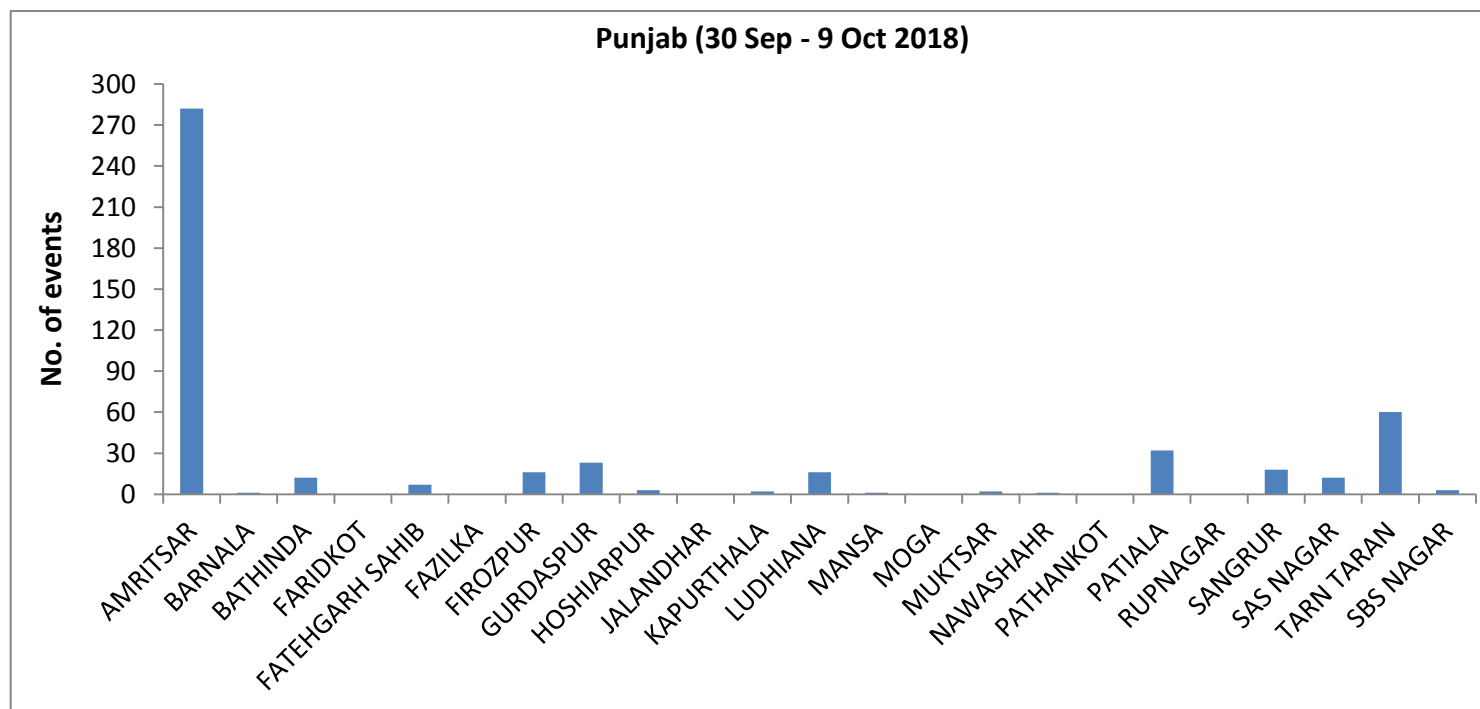
Details of residue burning events in Punjab on 09-Oct-2018

Event S. No.	District	Tehsil /Block	Satellite	Longitude	Latitude	Time (IST)	Day/Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	74.55925	31.71240	12:48:00	D	3.80
2	AMRITSAR	AMRITSAR I	AQUA-1	75.04455	31.53150	13:29:00	D	14.30
3	AMRITSAR	AMRITSAR I	S-NPP	75.04008	31.54805	12:48:00	D	3.50
4	AMRITSAR	AMRITSAR I	S-NPP	75.03962	31.54833	12:48:00	D	3.00
5	AMRITSAR	AMRITSAR I	S-NPP	75.01231	31.56457	12:48:00	D	8.10
6	AMRITSAR	AMRITSAR I	S-NPP	75.00946	31.57244	14:24:00	D	2.80
7	AMRITSAR	AMRITSAR I	S-NPP	75.06393	31.60627	12:48:00	D	6.20
8	AMRITSAR	AMRITSAR I	S-NPP	75.04832	31.61391	12:48:00	D	4.80
9	AMRITSAR	AMRITSAR I	S-NPP	75.05235	31.61491	12:48:00	D	4.80
10	AMRITSAR	AMRITSAR I	AQUA-1	74.97463	31.62283	13:29:00	D	14.82
11	AMRITSAR	AMRITSAR I	S-NPP	74.98200	31.65519	12:48:00	D	4.10
12	AMRITSAR	AMRITSAR I	S-NPP	75.08369	31.67028	12:48:00	D	2.90
13	AMRITSAR	AMRITSAR I	AQUA-1	75.05478	31.67523	13:29:00	D	9.04
14	AMRITSAR	AMRITSAR I	AQUA-1	75.06842	31.70218	13:29:00	D	7.68
15	AMRITSAR	AMRITSAR I	S-NPP	74.93958	31.71170	14:24:00	D	3.80
16	AMRITSAR	AMRITSAR I	S-NPP	74.94591	31.71196	14:24:00	D	3.80
17	AMRITSAR	AMRITSAR I	S-NPP	74.94134	31.71222	14:24:00	D	5.30
18	AMRITSAR	AMRITSAR I	AQUA-1	75.04625	31.73961	13:29:00	D	18.60
19	AMRITSAR	AMRITSAR I	S-NPP	74.97413	31.76383	12:48:00	D	2.90
20	AMRITSAR	AMRITSAR I	S-NPP	74.97362	31.76427	12:48:00	D	2.80
21	AMRITSAR	AMRITSAR I	S-NPP	75.02249	31.77566	12:48:00	D	2.60
22	AMRITSAR	AMRITSAR I	S-NPP	75.02650	31.77664	12:48:00	D	2.60
23	AMRITSAR	AMRITSAR I	S-NPP	75.02584	31.77740	12:48:00	D	5.70
24	AMRITSAR	AMRITSAR I	S-NPP	74.98026	31.78542	14:24:00	D	2.90
25	AMRITSAR	AMRITSAR I	S-NPP	74.96474	31.79086	12:48:00	D	1.90
26	AMRITSAR	AMRITSAR I	AQUA-1	74.93371	31.82046	13:29:00	D	8.99
27	AMRITSAR	AMRITSAR II	S-NPP	74.61281	31.50510	12:48:00	D	6.70
28	AMRITSAR	AMRITSAR II	S-NPP	74.61096	31.51055	12:48:00	D	6.70
29	AMRITSAR	AMRITSAR II	AQUA-1	74.79046	31.56893	13:29:00	D	8.04

30	AMRITSAR	AMRITSAR II	S-NPP	74.97974	31.65565	12:48:00	D	4.30
31	AMRITSAR	AMRITSAR II	AQUA-1	74.95928	31.65876	13:29:00	D	10.25
32	AMRITSAR	AMRITSAR II	S-NPP	74.95332	31.69526	12:48:00	D	2.00
33	AMRITSAR	BABA BAKALA	S-NPP	75.16599	31.53967	14:24:00	D	3.80
34	AMRITSAR	BABA BAKALA	AQUA-1	75.11787	31.55995	13:29:00	D	9.39
35	AMRITSAR	BABA BAKALA	AQUA-1	75.11958	31.58540	13:29:00	D	8.72
36	AMRITSAR	BABA BAKALA	AQUA-1	75.18950	31.63181	13:29:00	D	8.04
37	AMRITSAR	BABA BAKALA	S-NPP	75.17002	31.64994	14:24:00	D	5.60
38	AMRITSAR	BABA BAKALA	S-NPP	75.18821	31.65990	12:48:00	D	2.10
39	AMRITSAR	BABA BAKALA	S-NPP	75.17090	31.74351	12:48:00	D	2.40
40	BARNALA	BARNALA	S-NPP	75.66213	30.35502	12:48:00	D	4.00
41	FATEHGARH SAHIB	ALMOH	S-NPP	76.17275	30.57040	12:48:00	D	5.20
42	FATEHGARH SAHIB	ALMOH	AQUA-1	76.15979	30.57330	13:29:00	D	6.36
43	FIROZPUR	FIROZPUR	S-NPP	74.52410	30.93195	14:24:00	D	5.40
44	GURDASPUR	BATALA	S-NPP	75.15818	31.76887	12:48:00	D	5.60
45	GURDASPUR	BATALA	S-NPP	75.15157	31.80142	12:48:00	D	4.10
46	GURDASPUR	BATALA	S-NPP	75.15053	31.80293	12:48:00	D	2.70
47	GURDASPUR	BATALA	S-NPP	75.12037	31.80523	12:48:00	D	3.80
48	GURDASPUR	BATALA	S-NPP	75.11945	31.80658	12:48:00	D	4.70
49	KAPURTHALA	BHOLATH	S-NPP	75.47609	31.52663	12:48:00	D	3.10
50	LUDHIANA	SAMRALA	AQUA-1	76.15638	30.85926	13:29:00	D	9.19
51	PATIALA	RAJPURA	AQUA-1	76.63385	30.55533	13:29:00	D	7.87
52	PATIALA	SAMANA	AQUA-1	76.15297	29.85165	13:29:00	D	8.07
53	PATIALA	SAMANA	AQUA-1	76.23482	29.88160	13:29:00	D	8.23
54	SANGRUR	SANGRUR	S-NPP	75.90255	30.19282	12:48:00	D	1.70
55	SAS NAGAR	DERABASSI	AQUA-1	76.89817	30.40112	13:29:00	D	6.60
56	SAS NAGAR	DERABASSI	AQUA-1	76.79585	30.54485	13:29:00	D	7.90
57	TARN TARAN	KHADOOR SAHIB	S-NPP	75.02451	31.33267	14:24:00	D	4.60
58	TARN TARAN	KHADOOR SAHIB	S-NPP	75.03085	31.33295	14:24:00	D	7.60
59	TARN TARAN	KHADOOR SAHIB	S-NPP	75.02644	31.33342	14:24:00	D	4.20
60	TARN TARAN	KHADOOR SAHIB	S-NPP	75.03278	31.33373	14:24:00	D	4.20
61	TARN TARAN	KHADOOR SAHIB	S-NPP	75.06350	31.34496	12:48:00	D	2.20
62	TARN TARAN	KHADOOR SAHIB	S-NPP	75.06380	31.34502	12:48:00	D	2.10

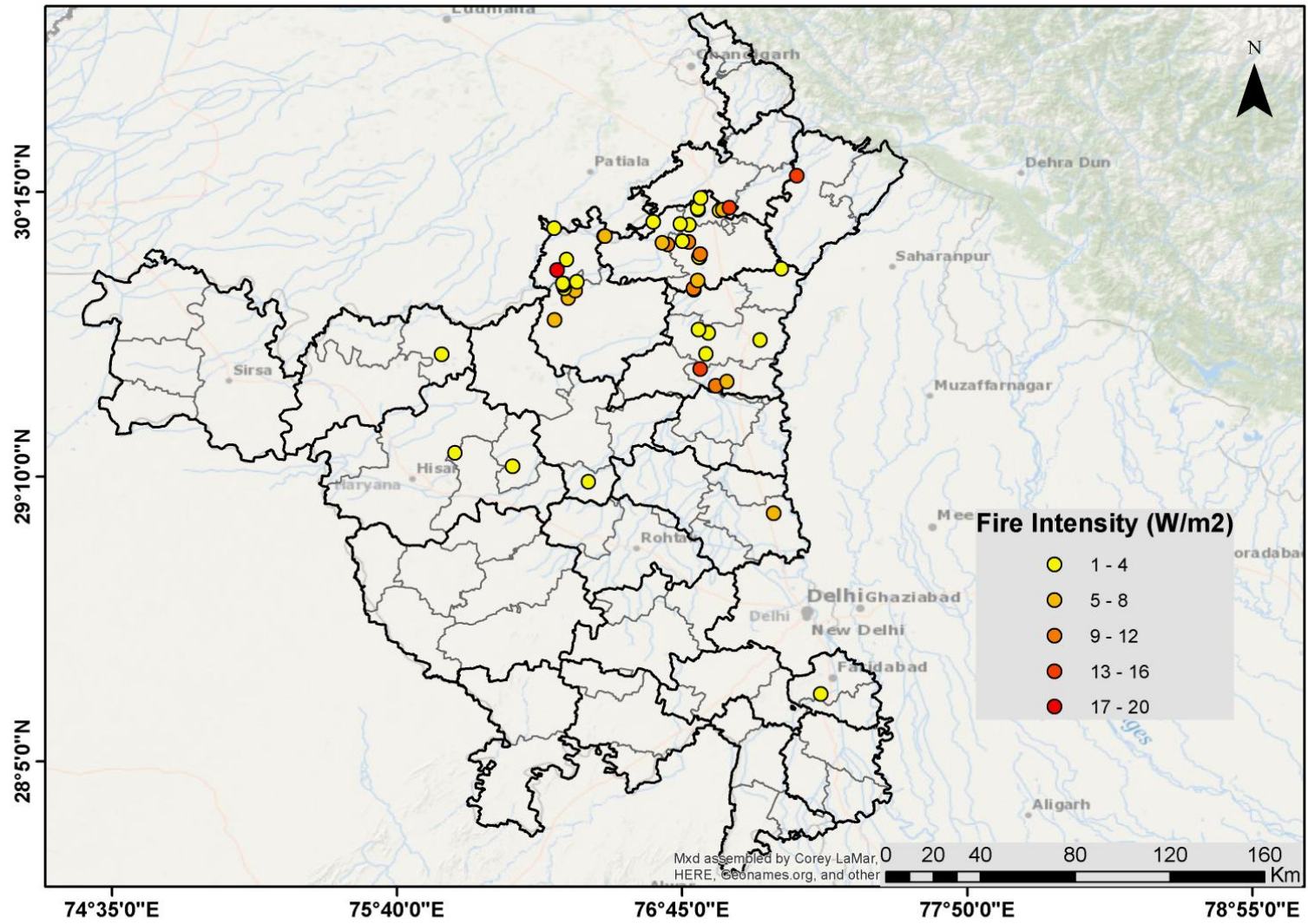
63	TARN TARAN	KHADOOR SAHIB	AQUA-1	75.09434	31.36322	13:29:00	D	10.89
64	TARN TARAN	KHADOOR SAHIB	S-NPP	75.15260	31.36668	12:48:00	D	1.90
65	TARN TARAN	KHADOOR SAHIB	S-NPP	75.15202	31.36715	12:48:00	D	1.50
66	TARN TARAN	KHADOOR SAHIB	AQUA-1	75.07695	31.38478	13:29:00	D	28.73
67	TARN TARAN	KHADOOR SAHIB	AQUA-1	74.92518	31.39077	13:29:00	D	8.92
68	TARN TARAN	KHADOOR SAHIB	AQUA-1	75.15076	31.41814	13:29:00	D	19.93
69	TARN TARAN	KHADOOR SAHIB	S-NPP	75.15564	31.44852	12:48:00	D	5.50
70	TARN TARAN	KHADOOR SAHIB	S-NPP	75.13384	31.44892	12:48:00	D	1.90
71	TARN TARAN	KHADOOR SAHIB	S-NPP	75.21138	31.46217	12:48:00	D	3.00
72	TARN TARAN	KHADOOR SAHIB	AQUA-1	75.05478	31.46263	13:29:00	D	8.60
73	TARN TARAN	KHADOOR SAHIB	AQUA-1	74.98316	31.48958	13:29:00	D	7.40
74	TARN TARAN	KHADOOR SAHIB	AQUA-1	75.07183	31.50605	13:29:00	D	7.12
75	TARN TARAN	KHADOOR SAHIB	S-NPP	74.84444	31.52234	12:48:00	D	3.70

District-wise cumulative number of residue burning events in Punjab (30-Sep-2018 to 09-Oct-2018)



(b) Haryana

Paddy Residue Burning in Haryana on 9th Oct 2018

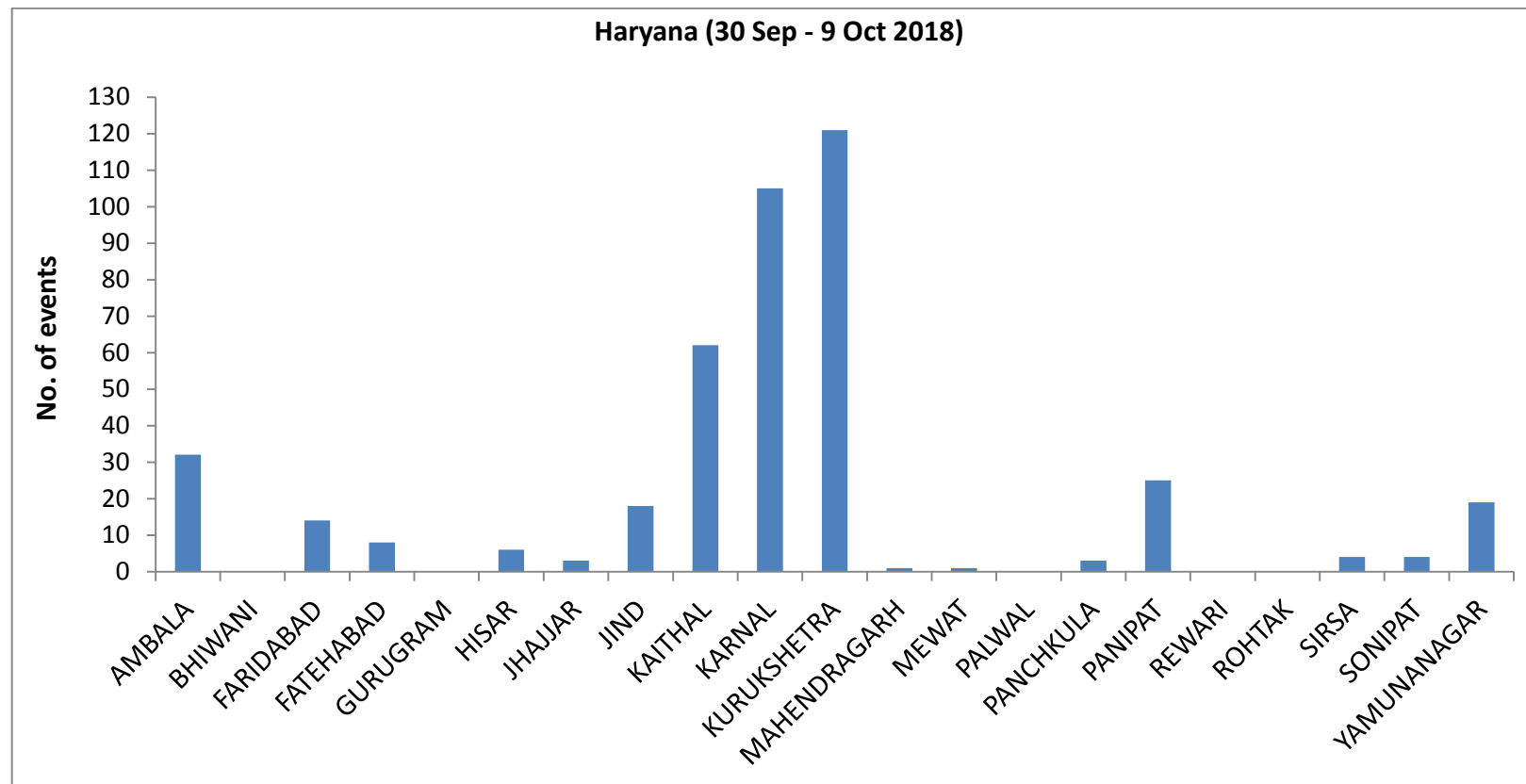


Details of residue burning events in Haryana on 09-Oct-2018

Event S. No.	District	Tehsil /Block	Satellite	Longitude	Latitude	Time (IST)	Day/Night	Fire Power (W/m2)
1	AMBALA	AMBALA	S-NPP	76.81884	30.22631	12:48:00	D	3.00
2	AMBALA	BARARA	AQUA-1	77.18465	30.31129	13:29:00	D	13.24
3	FARIDABAD	FARIDABAD	S-NPP	77.27576	28.34071	01:30:00	N	1.40
4	FATEHABAD	TOHANA	S-NPP	75.83484	29.63197	12:48:00	D	1.40
5	HISAR	HANSI	S-NPP	75.88715	29.25703	01:30:00	N	0.40
6	HISAR	NARNAUND	S-NPP	76.10540	29.20617	12:48:00	D	2.90
7	JIND	JULANA	S-NPP	76.39342	29.14782	01:30:00	N	0.50
8	KAITHAL	GUHLA	AQUA-1	76.27404	29.95197	13:29:00	D	18.08
9	KAITHAL	GUHLA	S-NPP	76.31122	29.99300	12:48:00	D	1.60
10	KAITHAL	GUHLA	S-NPP	76.45229	30.08140	12:48:00	D	6.20
11	KAITHAL	GUHLA	S-NPP	76.26246	30.11280	12:48:00	D	2.20
12	KAITHAL	KAITHAL	AQUA-1	76.26381	29.76332	13:29:00	D	7.87
13	KAITHAL	KAITHAL	AQUA-1	76.31667	29.84566	13:29:00	D	6.59
14	KAITHAL	KAITHAL	S-NPP	76.34330	29.87510	14:24:00	D	7.90
15	KAITHAL	KAITHAL	S-NPP	76.30311	29.88161	12:48:00	D	2.40
16	KAITHAL	KAITHAL	S-NPP	76.29800	29.89558	12:48:00	D	6.10
17	KAITHAL	KAITHAL	S-NPP	76.29641	29.90076	12:48:00	D	3.20
18	KAITHAL	KAITHAL	S-NPP	76.34931	29.90791	12:48:00	D	3.20
19	KARNAL	GHARAUNDA	AQUA-1	76.87771	29.51179	13:29:00	D	9.33
20	KARNAL	GHARAUNDA	AQUA-1	76.92034	29.52826	13:29:00	D	7.31
21	KARNAL	GHARAUNDA	AQUA-1	76.81802	29.57617	13:29:00	D	12.56
22	KARNAL	INDRI	S-NPP	77.12797	29.95658	12:48:00	D	1.40
23	KARNAL	KARNAL	S-NPP	76.83966	29.63333	12:48:00	D	2.60
24	KARNAL	KARNAL	S-NPP	77.04648	29.68662	12:48:00	D	1.10
25	KARNAL	KARNAL	S-NPP	76.84950	29.71339	12:48:00	D	2.70
26	KARNAL	KARNAL	S-NPP	76.81230	29.72628	12:48:00	D	3.00
27	KARNAL	NILOKHERI	S-NPP	76.79389	29.87708	12:48:00	D	9.70
28	KURUKSHETRA	PEHOWA	S-NPP	76.67495	30.05601	12:48:00	D	4.80
29	KURUKSHETRA	PEHOWA	S-NPP	76.45586	30.08224	12:48:00	D	6.20
30	KURUKSHETRA	PEHOWA	S-NPP	76.74273	30.12820	12:48:00	D	3.70

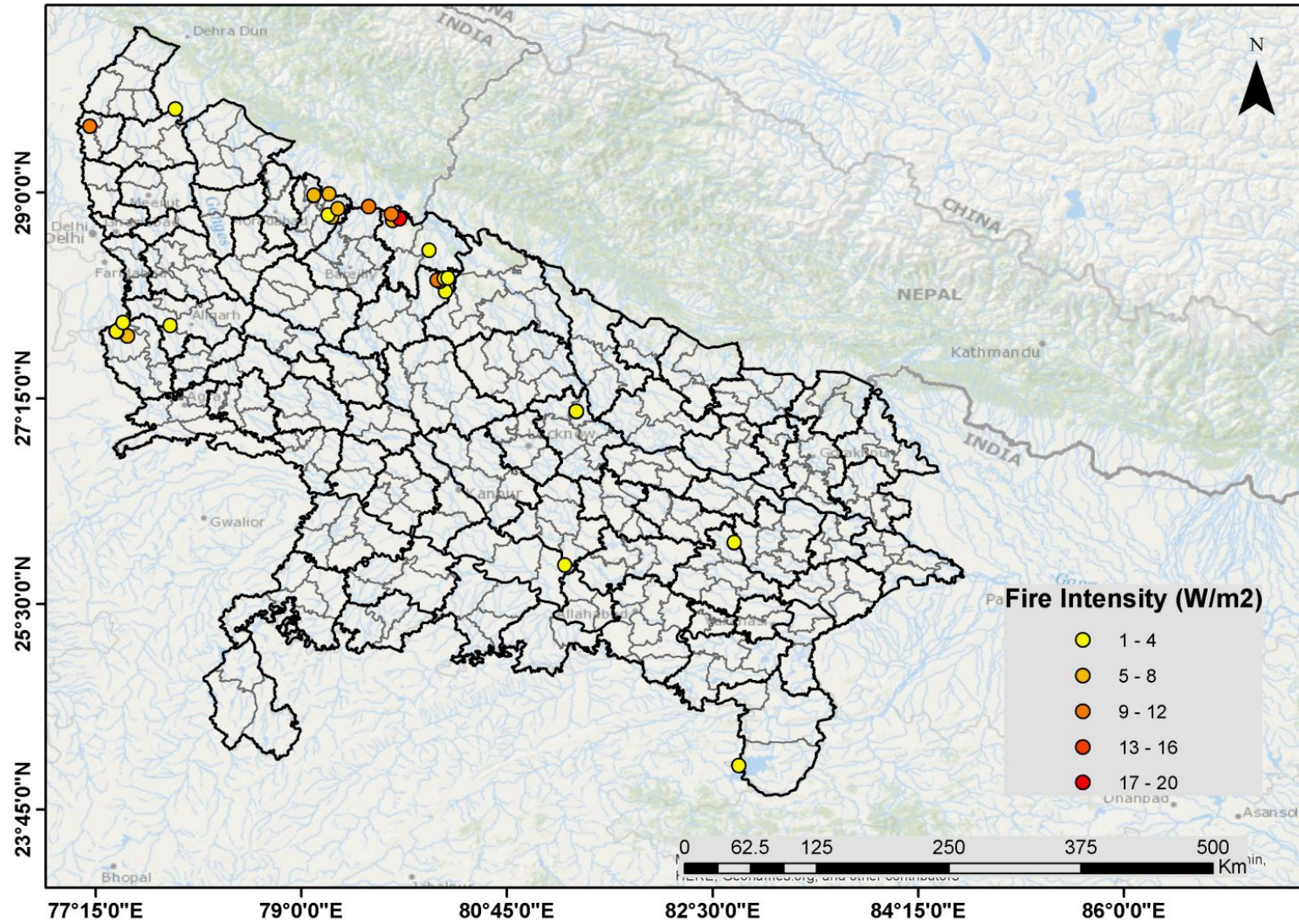
31	KURUKSHETRA	PEHOWA	S-NPP	76.63998	30.13646	12:48:00	D	2.50
32	KURUKSHETRA	SHAHABAD	S-NPP	76.77669	30.12544	12:48:00	D	1.70
33	KURUKSHETRA	SHAHABAD	S-NPP	76.89122	30.17903	12:48:00	D	1.90
34	KURUKSHETRA	SHAHABAD	S-NPP	76.81068	30.18166	12:48:00	D	2.00
35	KURUKSHETRA	SHAHABAD	S-NPP	76.90466	30.18217	12:48:00	D	4.80
36	KURUKSHETRA	SHAHABAD	S-NPP	76.80914	30.18665	12:48:00	D	4.00
37	KURUKSHETRA	SHAHABAD	AQUA-1	76.92886	30.19002	13:29:00	D	12.49
38	KURUKSHETRA	THANESAR	S-NPP	76.79390	29.88003	12:48:00	D	18.20
39	KURUKSHETRA	THANESAR	S-NPP	76.79237	29.88211	12:48:00	D	9.70
40	KURUKSHETRA	THANESAR	S-NPP	76.80883	29.91297	12:48:00	D	5.70
41	KURUKSHETRA	THANESAR	S-NPP	76.81526	30.00052	12:48:00	D	3.60
42	KURUKSHETRA	THANESAR	S-NPP	76.81341	30.00222	12:48:00	D	3.90
43	KURUKSHETRA	THANESAR	S-NPP	76.81721	30.01387	12:48:00	D	8.20
44	KURUKSHETRA	THANESAR	S-NPP	76.69542	30.04996	12:48:00	D	9.20
45	KURUKSHETRA	THANESAR	AQUA-1	76.77539	30.05976	13:29:00	D	11.53
46	KURUKSHETRA	THANESAR	S-NPP	76.75084	30.06287	12:48:00	D	3.20
47	SONIPAT	SONIPAT	AQUA-1	77.09768	29.02670	13:29:00	D	6.45

District-wise cumulative number of residue burning events in Haryana (30-Sep-2018 to 09-Oct-2018)



(c) Uttar Pradesh

Paddy Residue Burning in Uttar Pradesh on 9th Oct 2018

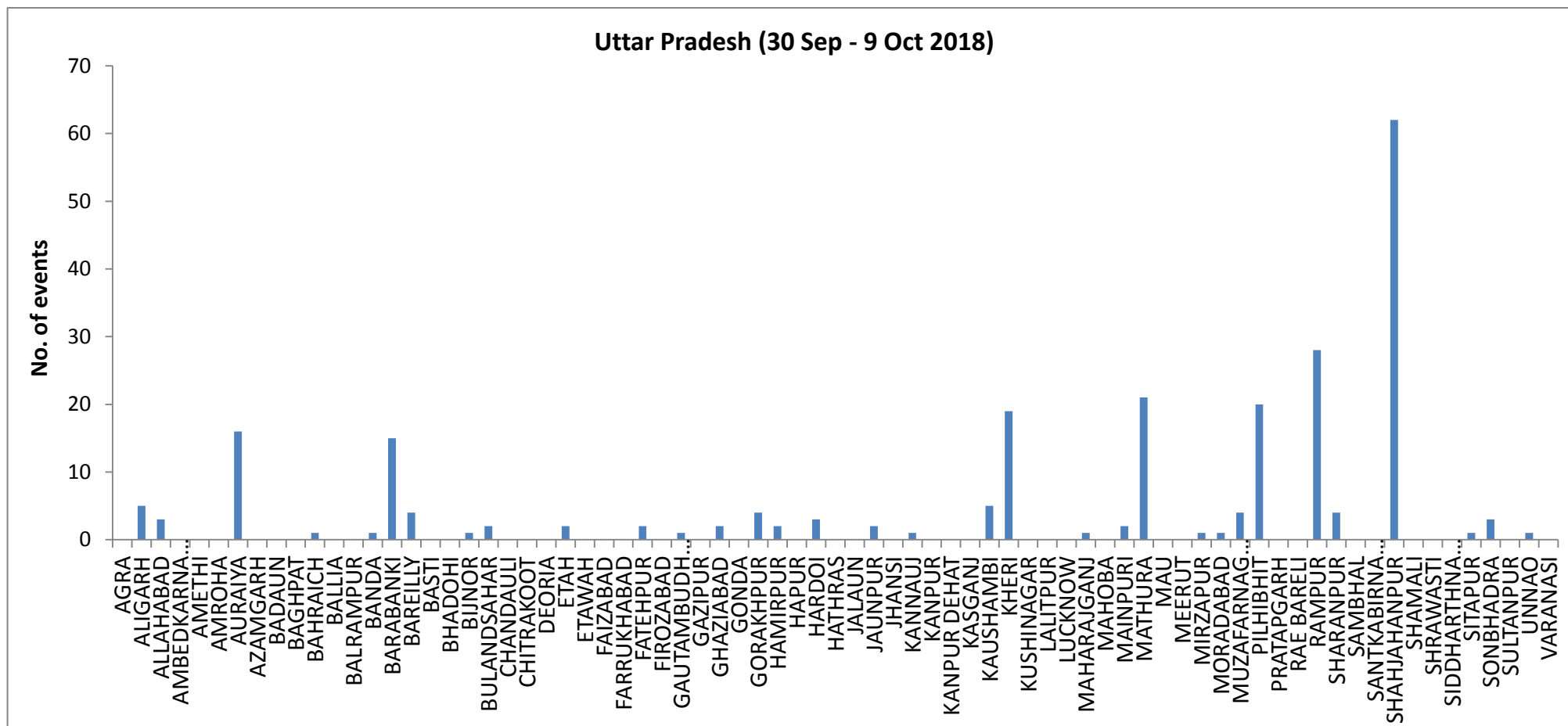


Details of residue burning events in Uttar Pradesh on 09-Oct-2018

Event S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day/Night	Fire Power (W/m2)
1	ALIGARH	IGLAS	S-NPP	77.88406	27.87139	12:48:00	D	3.20
2	BARABANKI	RAMNAGAR	S-NPP	81.33804	27.13920	12:42:00	D	2.90
3	BARABANKI	RAMNAGAR	S-NPP	81.33820	27.14084	12:42:00	D	2.70
4	BAREILLY	BAHERI	AQUA-1	79.57373	28.88297	13:29:00	D	8.10
5	FATEHPUR	KHAGA	S-NPP	81.24390	25.83196	12:42:00	D	3.10
6	JAUNPUR	SHHGANJ	S-NPP	82.68316	26.02120	01:30:00	N	0.90
7	JAUNPUR	SHHGANJ	S-NPP	82.68375	26.02465	01:30:00	N	0.90
8	MATHURA	CHHATA	S-NPP	77.51955	27.78281	12:48:00	D	4.60
9	MATHURA	CHHATA	AQUA-1	77.43192	27.81547	13:29:00	D	11.10
10	MATHURA	CHHATA	S-NPP	77.42449	27.82061	12:48:00	D	2.80
11	MATHURA	CHHATA	S-NPP	77.42796	27.82140	12:48:00	D	2.80
12	MATHURA	CHHATA	S-NPP	77.48443	27.89553	12:48:00	D	3.70
13	MUZAFARNAGAR	KAIRANA	AQUA-1	77.20205	29.56479	13:29:00	D	8.78
14	MUZAFARNAGAR	MUZAFFARNAGAR	S-NPP	77.92558	29.71099	12:48:00	D	2.80
15	PILHIBHIT	PILHIBHIT	AQUA-1	79.77495	28.76469	13:29:00	D	6.73
16	PILHIBHIT	PILHIBHIT	AQUA-1	79.83770	28.77966	13:29:00	D	16.42
17	PILHIBHIT	PILHIBHIT	AQUA-1	79.76472	28.81859	13:29:00	D	8.90
18	PILHIBHIT	PURANPUR	S-NPP	80.08599	28.50992	12:48:00	D	3.90
19	RAMPUR	BILASPUR	S-NPP	79.25919	28.79461	12:48:00	D	3.30
20	RAMPUR	BILASPUR	S-NPP	79.26088	28.79488	12:48:00	D	4.60
21	RAMPUR	BILASPUR	S-NPP	79.22711	28.81143	12:48:00	D	2.00
22	RAMPUR	BILASPUR	AQUA-1	79.31112	28.86351	13:29:00	D	5.74
23	RAMPUR	SUAR	S-NPP	79.10718	28.97664	12:48:00	D	3.10
24	RAMPUR	SUAR	S-NPP	79.10593	28.98115	12:48:00	D	3.50
25	RAMPUR	SUAR	S-NPP	79.10849	28.98122	12:48:00	D	5.30
26	RAMPUR	SUAR	S-NPP	79.23623	28.98966	12:48:00	D	4.20
27	SHAHJAHANPUR	PUWANYA	S-NPP	80.22565	28.16024	12:48:00	D	2.10
28	SHAHJAHANPUR	PUWANYA	S-NPP	80.17534	28.24600	12:48:00	D	9.00

29	SHAHJAHANPUR	PUWANYA	AQUA-1	80.15352	28.25565	13:29:00	D	8.28
30	SHAHJAHANPUR	PUWANYA	S-NPP	80.21765	28.27291	12:48:00	D	2.20
31	SHAHJAHANPUR	PUWANYA	S-NPP	80.24667	28.27440	12:48:00	D	2.60
32	SONBHADRA	DUDHI	S-NPP	82.72327	24.12760	01:30:00	N	1.20

District-wise cumulative number of residue burning events in Uttar Pradesh (30-Sep-2018 to 09-Oct-2018)



The study used images received from following Satellites at IARI Satellite Ground Station

S. No.	Satellite Name	Sensor	Resolution (meter)	Day / Night Passes
1.	Suomi NPP	VIIRS	375 / 1000	Both
2.	Terra	MODIS	1000	Both
3.	Aqua	MODIS	1000	Both
4.	NOAA – 18	AVHRR	1000	Night
5.	NOAA – 19	AVHRR	1000	Night
6.	Metop - 1	AVHRR	1000	Night
7.	Metop - 2	AVHRR	1000	Night

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GIS Maps of fire events can be visualized online on ICAR KRISHI Geoportal websites:

<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

<http://creams.iari.res.in:8080/geoexplorer/composer/>
