



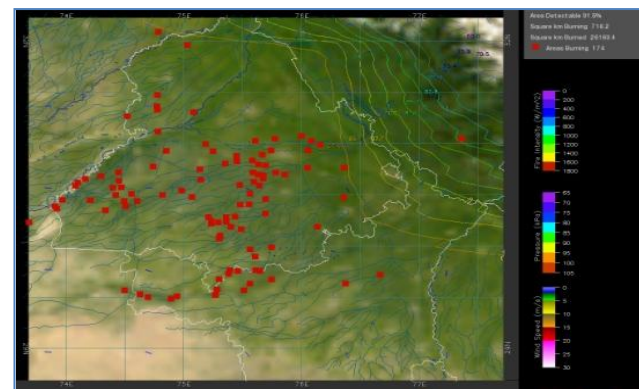
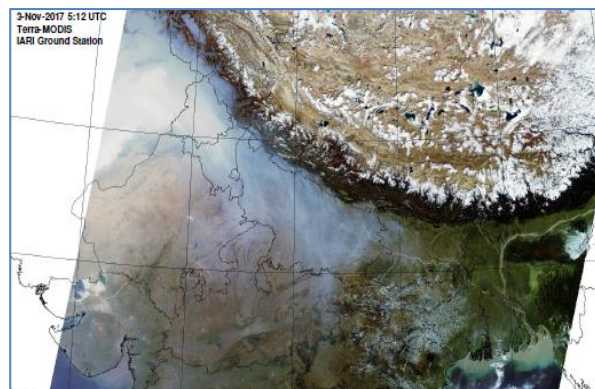
**Bulletin
No. 08**

**Events Date:
08-Oct-2019**

**Issued on:
09-Oct-2019**



MONITORING PADDY RESIDUE BURNING IN NORTH INDIA USING SATELLITE REMOTE SENSING DURING 2019



Prepared by:

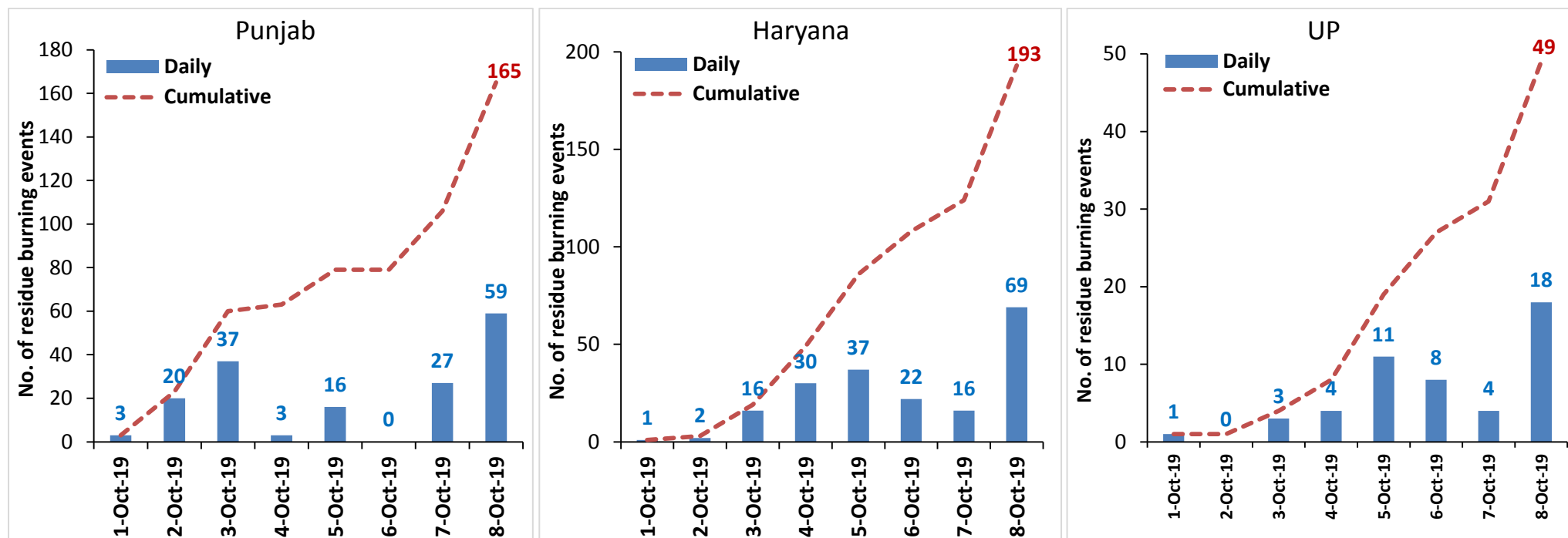
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

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

Highlights for 08-October-2019

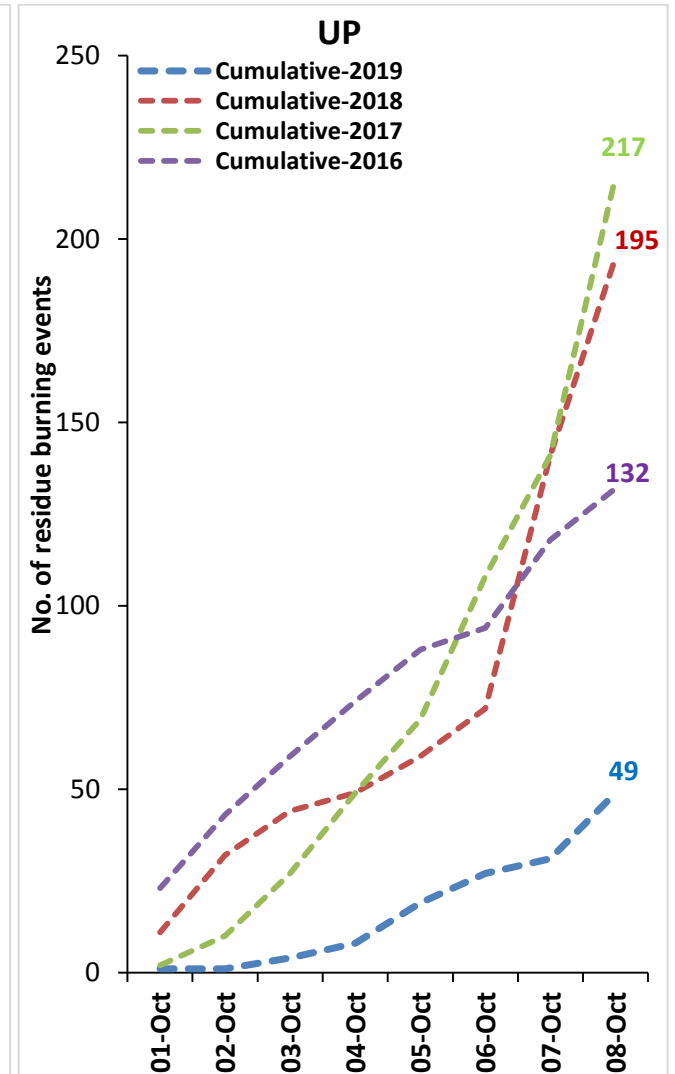
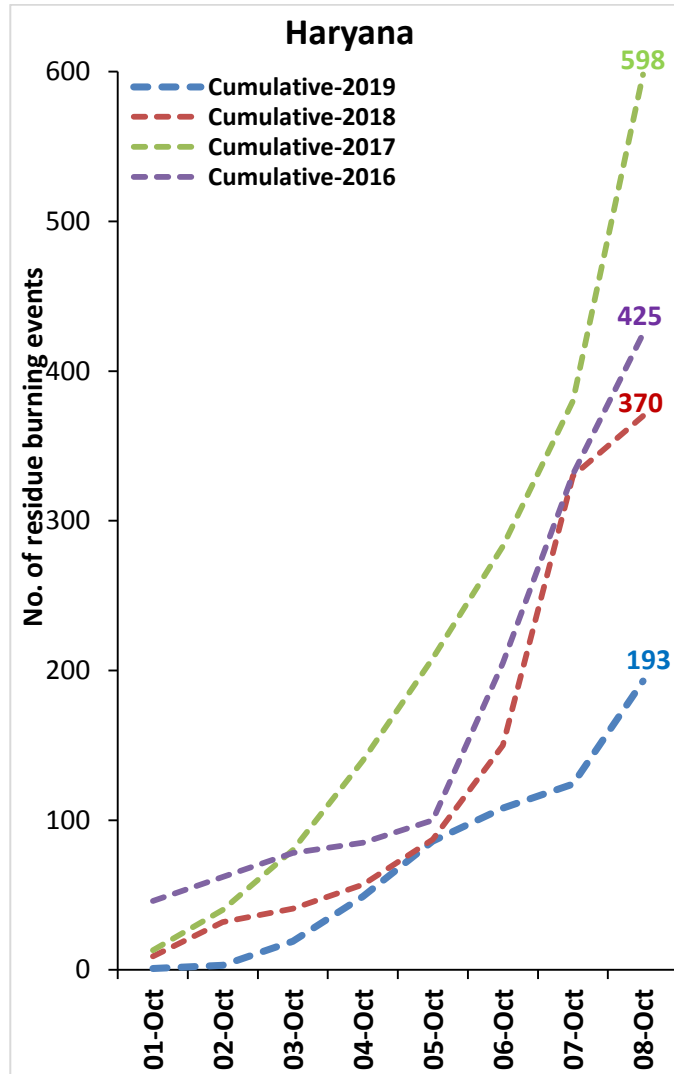
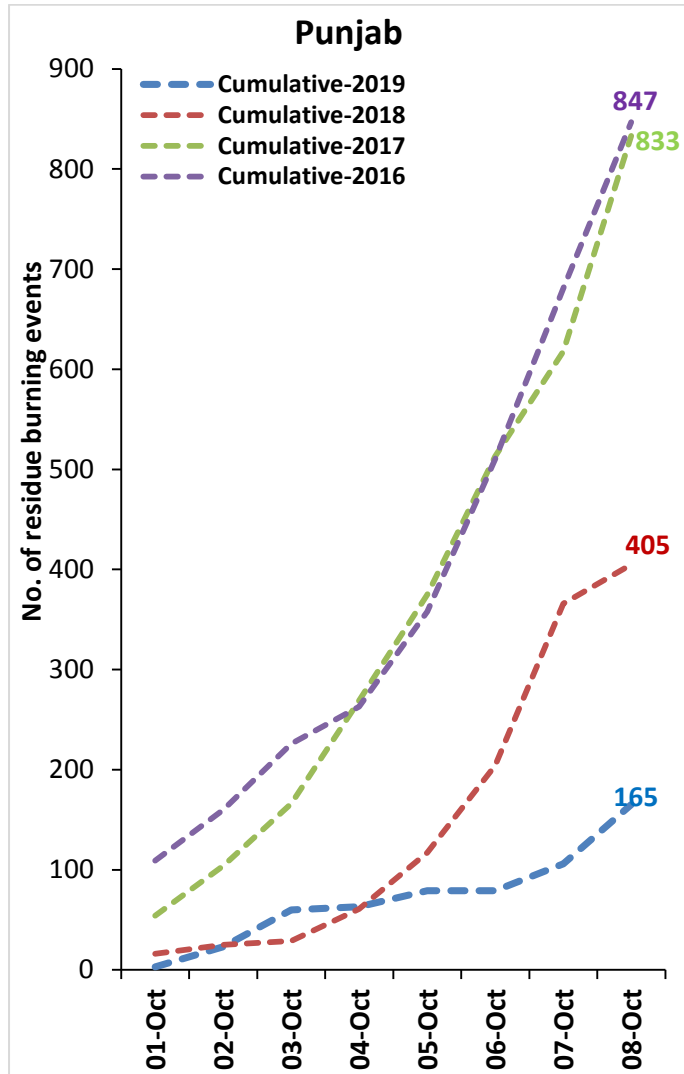
- Satellites detected **146** residue burning events in the three study States on 08-Oct-2019.
- **59, 69** and **18** burning events were recorded in Punjab, Haryana and UP, respectively.
- In Punjab most of the burning events were recorded in Amritsar and Tarn Taran districts.
- In Haryana the burning events were scattered across Kaithal, Karnal and Kurukshetra districts.
- The residue burning events are very few till date in the three study States being monitored.
- Overall, the total burning events recorded in the three states are **58%** less than in 2018 till date. This reduction is **60%** in Punjab, **48%** in Haryana and **75%** in UP in current season as compared to 2018.

Temporal distribution of residue burning events for the three study States in 2019

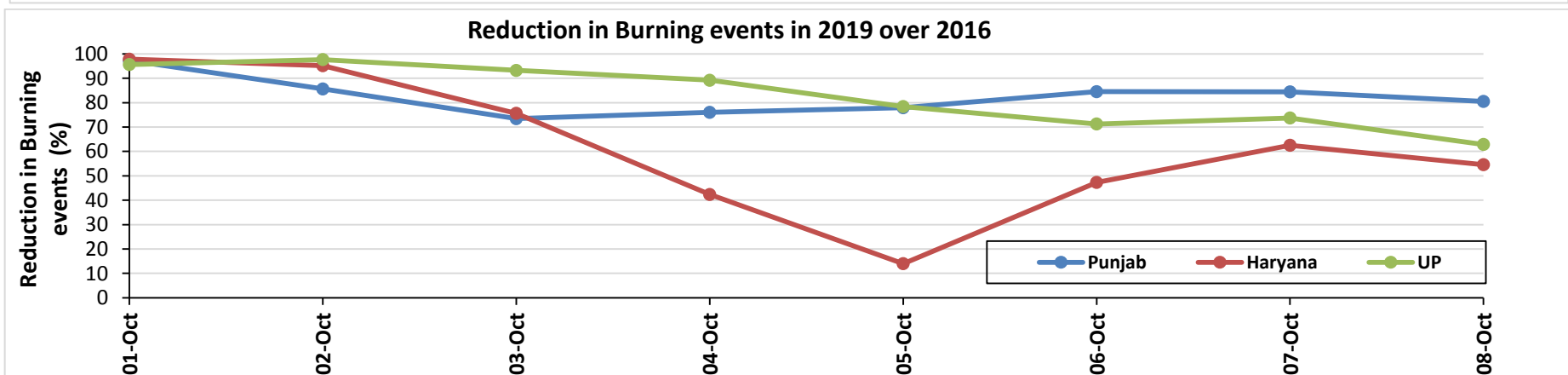
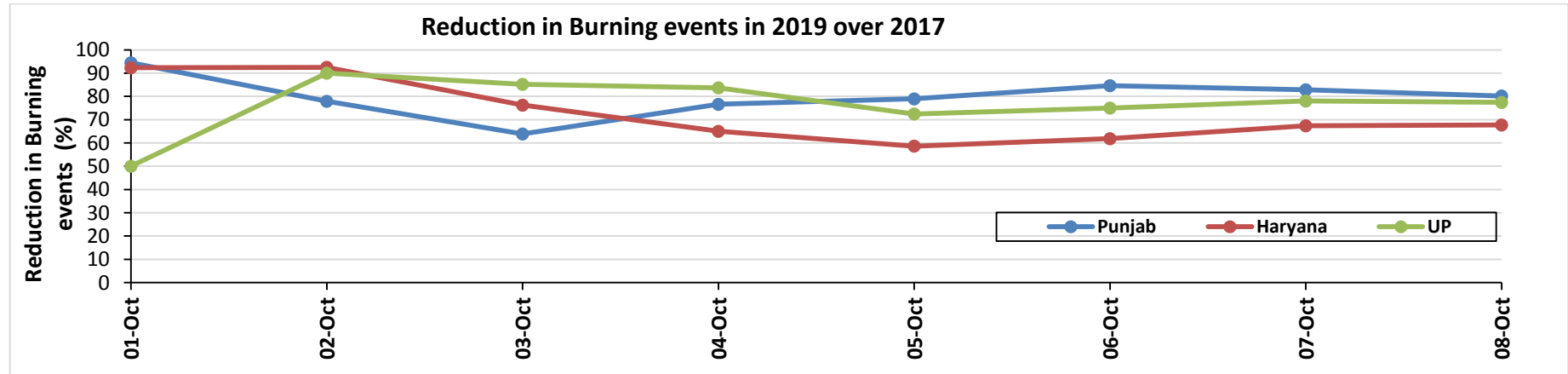
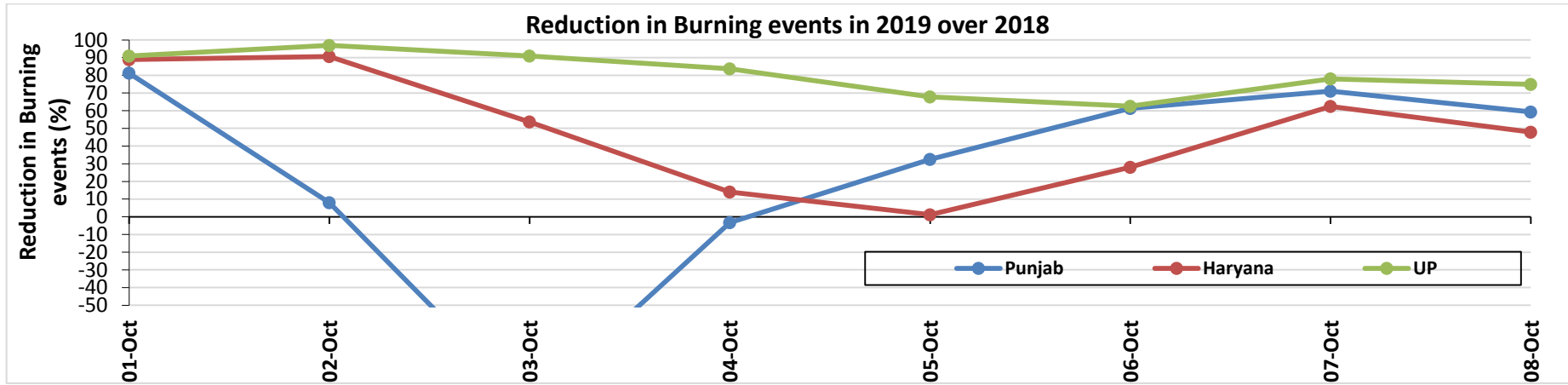


Comparison of residue burning events in current year (2019) with previous years (2018, 2017 & 2016) for the three study States

(01-Oct to 08-Oct)

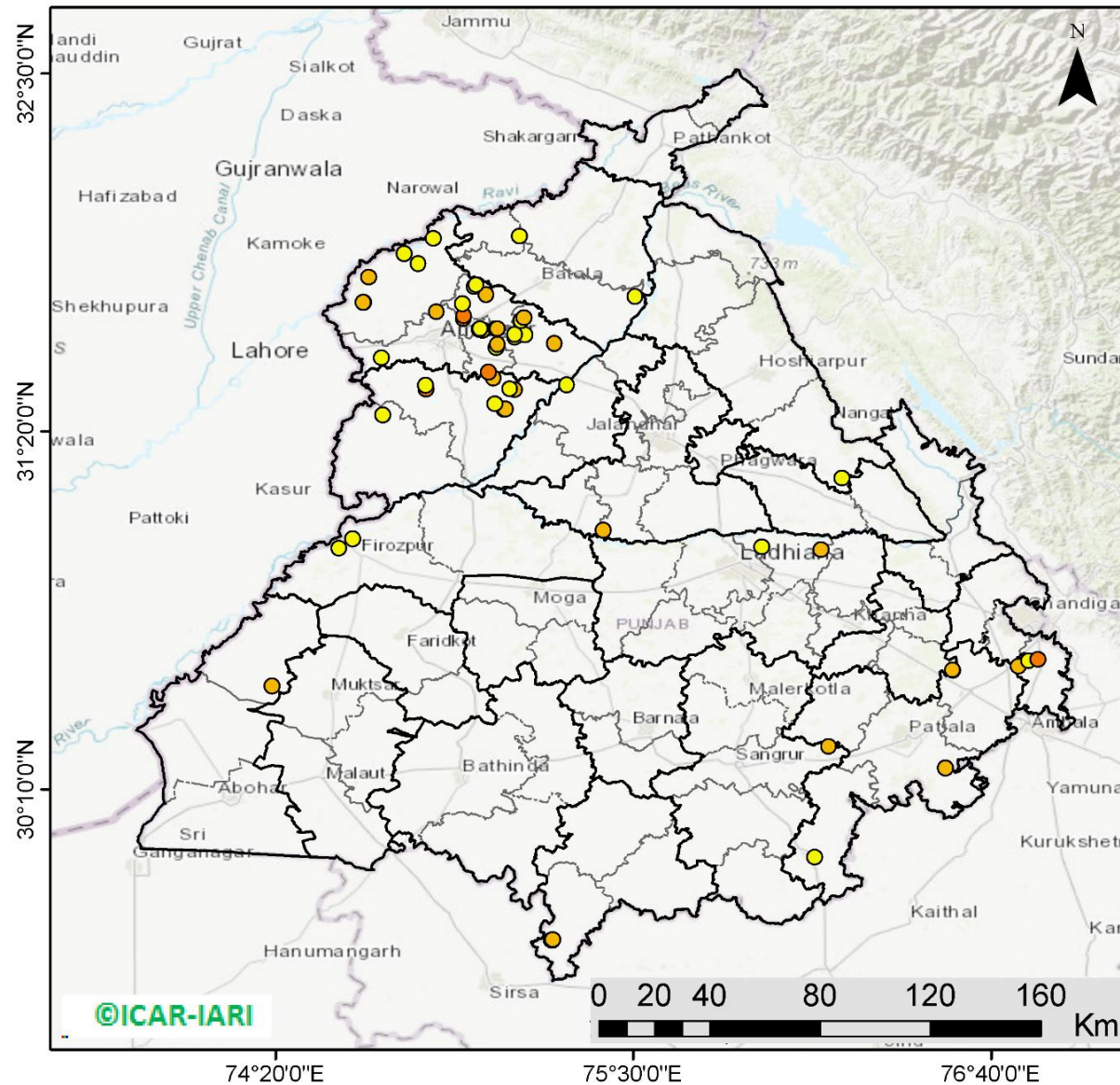


Percent Reduction in Burning events in 2019 over 2018, 2017 and 2016 (Daily Cumulative)



(a) Punjab

RICE RESIDUE BURNING IN PUNJAB



59 burning events detected in Punjab on **08th October 2019**

Fire Intensity (W/m²)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20

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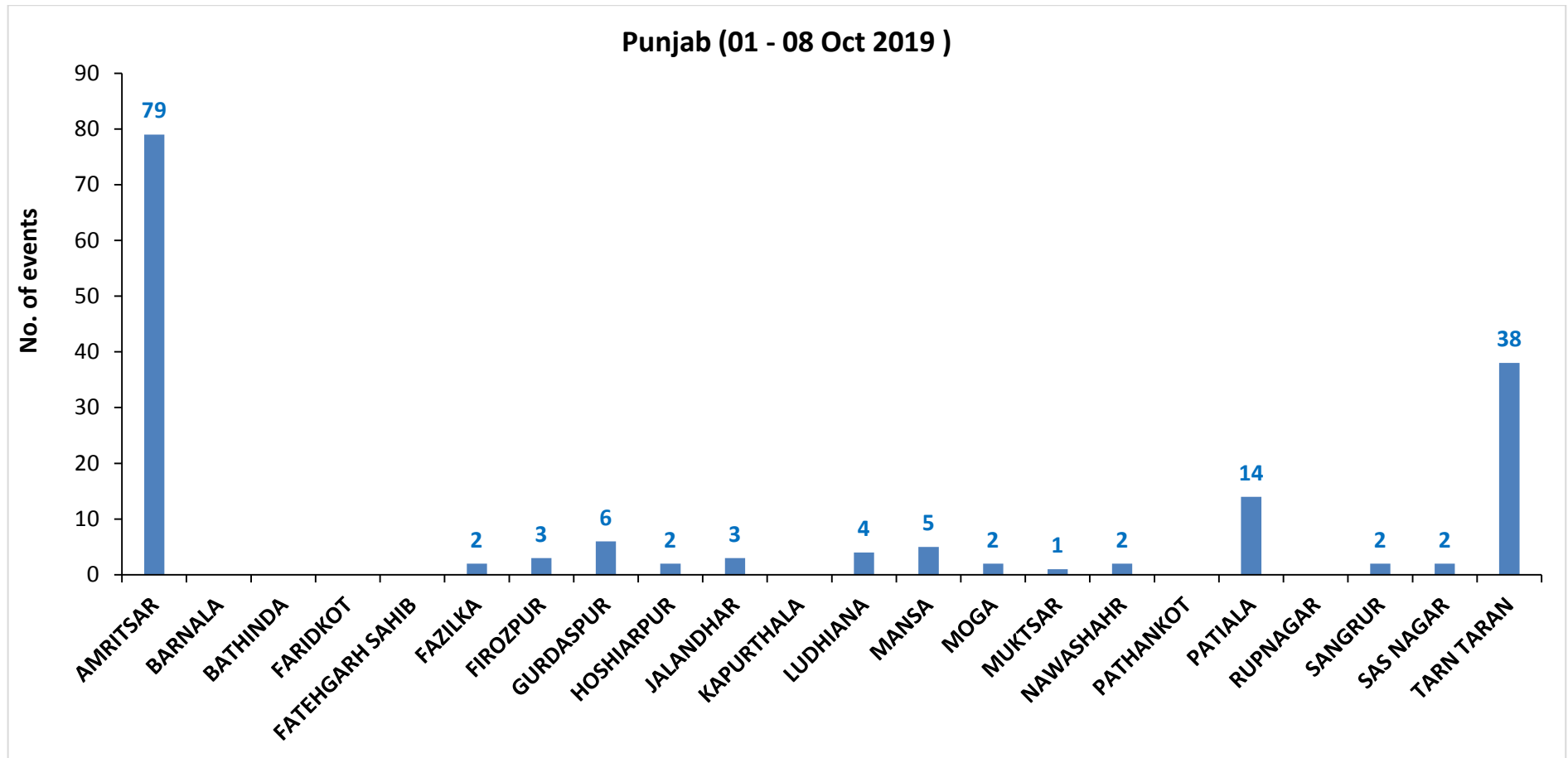
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

Details of residue burning events in Punjab on 08-Oct-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	74.62132	31.75355	14:00:00	D	6.80
2	AMRITSAR	AJNALA	S-NPP	74.61877	31.75414	14:00:00	D	5.20
3	AMRITSAR	AJNALA	S-NPP	74.63665	31.83572	14:00:00	D	6.50
4	AMRITSAR	AJNALA	S-NPP	74.79959	31.88042	14:00:00	D	3.30
5	AMRITSAR	AJNALA	S-NPP	74.75359	31.91241	14:00:00	D	4.10
6	AMRITSAR	AJNALA	S-NPP	74.84765	31.96210	14:00:00	D	4.80
7	AMRITSAR	AMRITSAR I	AQUA	75.02700	31.52700	14:00:00	D	12.60
8	AMRITSAR	AMRITSAR I	S-NPP	75.05333	31.60760	14:00:00	D	2.50
9	AMRITSAR	AMRITSAR I	S-NPP	75.05756	31.61715	14:00:00	D	6.50
10	AMRITSAR	AMRITSAR I	S-NPP	75.11319	31.64986	14:00:00	D	2.00
11	AMRITSAR	AMRITSAR I	S-NPP	75.00895	31.66305	14:00:00	D	6.60
12	AMRITSAR	AMRITSAR I	S-NPP	74.99778	31.66656	14:00:00	D	6.10
13	AMRITSAR	AMRITSAR I	S-NPP	75.05150	31.66708	14:00:00	D	7.00
14	AMRITSAR	AMRITSAR I	S-NPP	75.05683	31.66758	14:00:00	D	7.00
15	AMRITSAR	AMRITSAR I	S-NPP	75.00133	31.66778	14:00:00	D	4.00
16	AMRITSAR	AMRITSAR I	S-NPP	74.94316	31.74929	14:00:00	D	3.10
17	AMRITSAR	AMRITSAR I	S-NPP	75.01999	31.77945	14:00:00	D	9.90
18	AMRITSAR	AMRITSAR I	S-NPP	74.98223	31.80462	14:00:00	D	1.90
19	AMRITSAR	AMRITSAR I	S-NPP	74.98701	31.80963	14:00:00	D	4.30
20	AMRITSAR	AMRITSAR II	S-NPP	74.67934	31.57301	14:00:00	D	4.20
21	AMRITSAR	AMRITSAR II	AQUA	74.94600	31.70100	14:00:00	D	11.00
22	AMRITSAR	AMRITSAR II	S-NPP	74.94814	31.70868	14:00:00	D	10.10
23	AMRITSAR	AMRITSAR II	AQUA	74.85900	31.72200	14:00:00	D	8.10
24	AMRITSAR	BABA BAKALA	S-NPP	75.24295	31.62007	14:00:00	D	7.40
25	AMRITSAR	BABA BAKALA	S-NPP	75.11428	31.64075	14:00:00	D	2.70
26	AMRITSAR	BABA BAKALA	S-NPP	75.14610	31.64830	14:00:00	D	4.70
27	AMRITSAR	BABA BAKALA	S-NPP	75.13368	31.69327	14:00:00	D	3.00
28	AMRITSAR	BABA BAKALA	S-NPP	75.13524	31.69343	14:00:00	D	3.00
29	AMRITSAR	BABA BAKALA	S-NPP	75.14340	31.70336	14:00:00	D	7.80
30	FAZILKA	JALALABAD	S-NPP	74.32225	30.50383	14:00:00	D	5.30
31	FIROZPUR	FIROZPUR	S-NPP	74.54021	30.95226	14:00:00	D	3.80
32	FIROZPUR	FIROZPUR	S-NPP	74.58554	30.98332	14:00:00	D	4.80

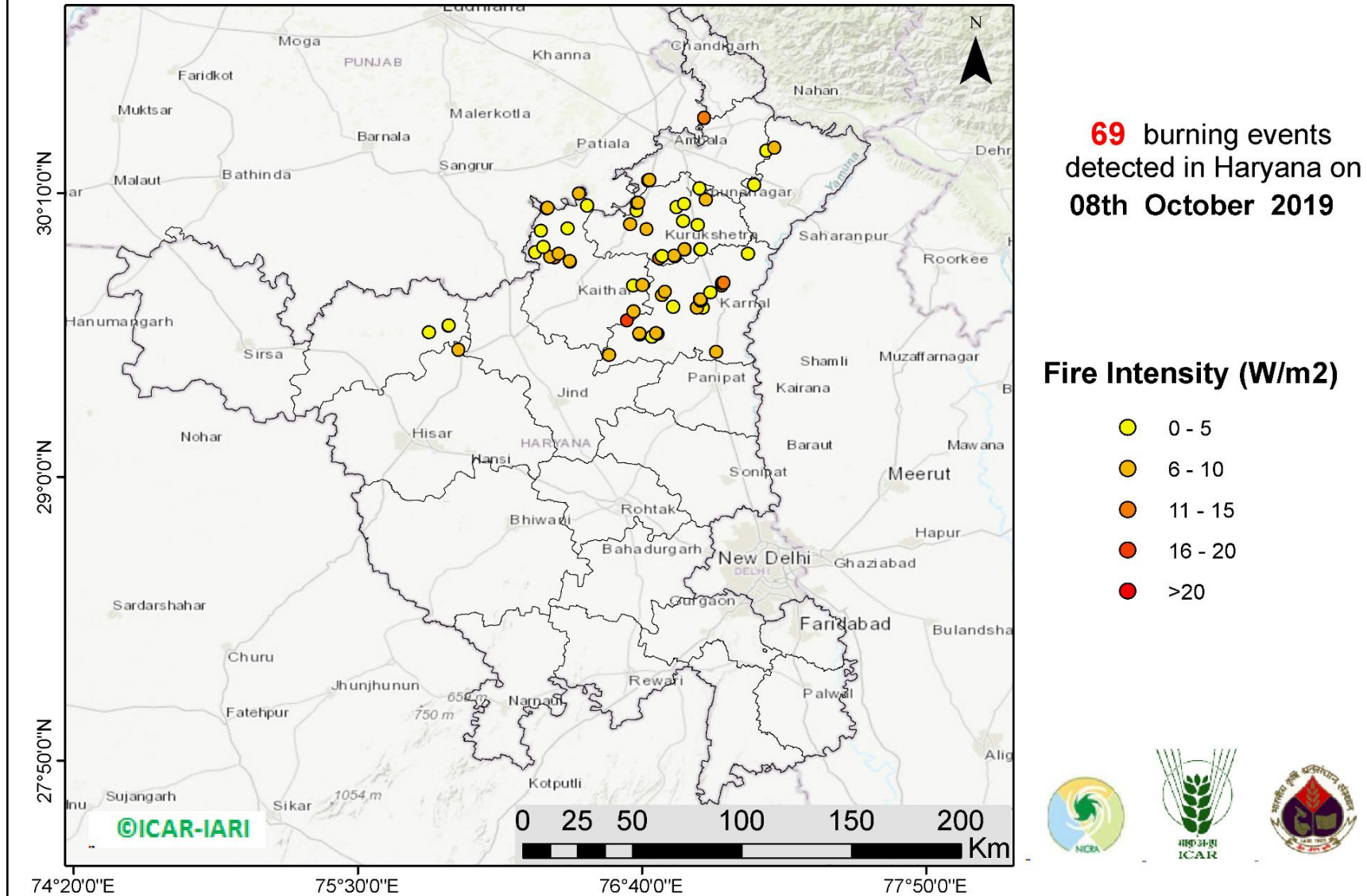
33	GURDASPUR	BATALA	S-NPP	75.50574	31.77278	14:00:00	D	3.60
34	GURDASPUR	DERA BABA NANAK	S-NPP	75.12807	31.96990	14:00:00	D	2.20
35	HOSHIARPUR	GARHSHANKAR	S-NPP	76.17989	31.18051	14:00:00	D	3.10
36	JALANDHAR	SHAHKOT	S-NPP	75.40218	31.01137	14:00:00	D	5.10
37	LUDHIANA	LUDHIANA EAST	S-NPP	76.11209	30.94821	14:00:00	D	5.40
38	LUDHIANA	LUDHIANA EAST	S-NPP	75.91944	30.95575	14:00:00	D	4.00
39	MANSA	SARDULGARH	S-NPP	75.23536	29.67344	14:00:00	D	12.50
40	MANSA	SARDULGARH	S-NPP	75.23237	29.67541	14:00:00	D	7.40
41	MANSA	SARDULGARH	S-NPP	75.23745	29.67588	14:00:00	D	9.40
42	PATIALA	PATIALA	S-NPP	76.51720	30.23677	14:00:00	D	5.50
43	PATIALA	RAJPURA	S-NPP	76.54311	30.55392	14:00:00	D	7.90
44	PATIALA	RAJPURA	S-NPP	76.54046	30.55518	14:00:00	D	7.50
45	PATIALA	RAJPURA	S-NPP	76.75421	30.56749	14:00:00	D	5.70
46	PATIALA	SAMANA	S-NPP	76.09100	29.94461	14:00:00	D	2.50
47	SANGRUR	SANGRUR	S-NPP	76.13732	30.30565	14:00:00	D	5.10
48	SAS NAGAR	DERABASSI	S-NPP	76.78931	30.58544	14:00:00	D	3.60
49	SAS NAGAR	DERABASSI	AQUA	76.81900	30.59000	14:00:00	D	13.90
50	TARN TARAN	KHADOOR SAHIB	S-NPP	75.07785	31.40647	14:00:00	D	7.20
51	TARN TARAN	KHADOOR SAHIB	S-NPP	75.08315	31.40696	14:00:00	D	7.20
52	TARN TARAN	KHADOOR SAHIB	S-NPP	75.04913	31.42213	14:00:00	D	4.30
53	TARN TARAN	KHADOOR SAHIB	S-NPP	75.11327	31.46946	14:00:00	D	8.80
54	TARN TARAN	KHADOOR SAHIB	S-NPP	74.82372	31.47085	14:00:00	D	14.90
55	TARN TARAN	KHADOOR SAHIB	S-NPP	75.09674	31.47248	14:00:00	D	2.50
56	TARN TARAN	KHADOOR SAHIB	S-NPP	74.82204	31.48425	14:00:00	D	4.90
57	TARN TARAN	KHADOOR SAHIB	S-NPP	75.28358	31.48473	14:00:00	D	3.90
58	TARN TARAN	KHADOOR SAHIB	AQUA	75.04400	31.50800	14:00:00	D	7.80
59	TARN TARAN	PATTI	S-NPP	74.68307	31.38744	14:00:00	D	4.40

District-wise cumulative number of residue burning events in Punjab (01 to 08-Oct 2019)



(b) Haryana

RICE RESIDUE BURNING IN HARYANA



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

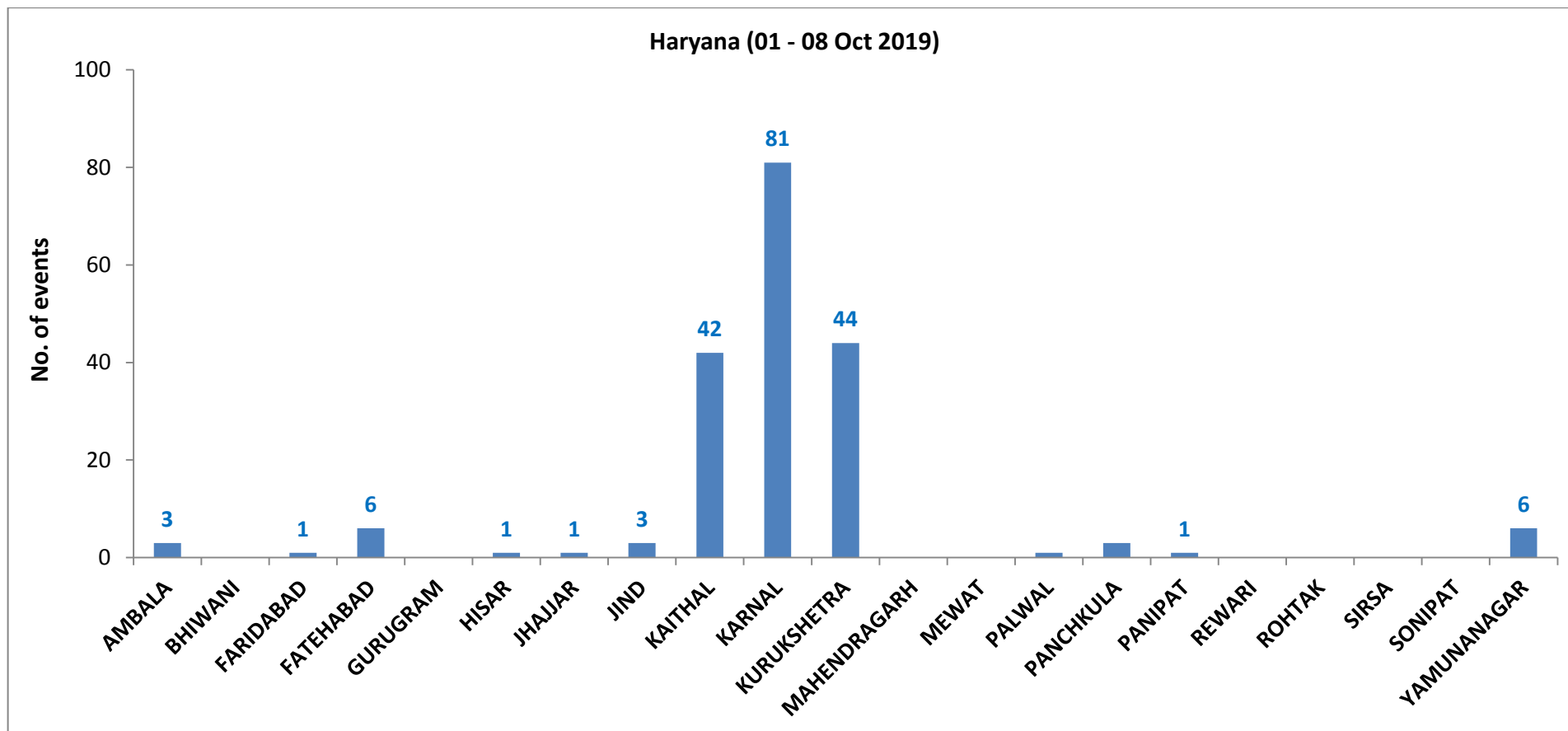
Details of residue burning events in Haryana on 08-Oct-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	AMBALA	AMBALA	S-NPP	76.69182	30.21994	14:00:00	D	4.50
2	AMBALA	AMBALA	S-NPP	76.69633	30.22173	14:00:00	D	8.60
3	FATEHABAD	FATEHABAD	S-NPP	75.79169	29.59400	14:00:00	D	4.70
4	FATEHABAD	TOHANA	S-NPP	75.87202	29.62041	14:00:00	D	3.60
5	FATEHABAD	TOHANA	S-NPP	75.87434	29.62287	14:00:00	D	3.10
6	HISAR	HISAR	S-NPP	75.91374	29.52275	14:00:00	D	5.60
7	KAITHAL	GUHLA	S-NPP	76.32536	29.91734	14:00:00	D	9.70
8	KAITHAL	GUHLA	S-NPP	76.22888	29.92339	14:00:00	D	2.90
9	KAITHAL	GUHLA	S-NPP	76.26215	29.94568	14:00:00	D	3.50
10	KAITHAL	GUHLA	S-NPP	76.25277	30.01235	14:00:00	D	2.70
11	KAITHAL	GUHLA	S-NPP	76.36031	30.02165	14:00:00	D	5.00
12	KAITHAL	GUHLA	S-NPP	76.27568	30.10545	14:00:00	D	10.80
13	KAITHAL	GUHLA	S-NPP	76.27830	30.10668	14:00:00	D	10.00
14	KAITHAL	GUHLA	S-NPP	76.44168	30.11676	14:00:00	D	4.90
15	KAITHAL	GUHLA	S-NPP	76.40904	30.16567	14:00:00	D	5.50
16	KAITHAL	KAITHAL	S-NPP	76.60548	29.64399	14:00:00	D	15.10
17	KAITHAL	KAITHAL	S-NPP	76.63256	29.68085	14:00:00	D	5.50
18	KAITHAL	KAITHAL	S-NPP	76.63108	29.78630	14:00:00	D	4.30
19	KAITHAL	KAITHAL	S-NPP	76.66834	29.78960	14:00:00	D	6.50
20	KAITHAL	KAITHAL	S-NPP	76.37247	29.88389	14:00:00	D	12.50
21	KAITHAL	KAITHAL	S-NPP	76.37100	29.88723	14:00:00	D	7.40
22	KAITHAL	KAITHAL	S-NPP	76.30909	29.90138	14:00:00	D	12.20
23	KAITHAL	KAITHAL	S-NPP	76.29071	29.90463	14:00:00	D	9.00
24	KARNAL	ASSANDH	S-NPP	76.53052	29.50201	14:00:00	D	6.30
25	KARNAL	ASSANDH	S-NPP	76.70810	29.57657	14:00:00	D	3.50
26	KARNAL	ASSANDH	S-NPP	76.65697	29.58683	14:00:00	D	5.40
27	KARNAL	ASSANDH	S-NPP	76.72939	29.58740	12:18:00	D	8.60
28	KARNAL	ASSANDH	S-NPP	76.65505	29.58909	14:00:00	D	6.20
29	KARNAL	ASSANDH	S-NPP	76.72469	29.59109	12:18:00	D	8.00
30	KARNAL	GHARAUNDA	S-NPP	76.97044	29.51410	14:00:00	D	7.50
31	KARNAL	GHARAUNDA	S-NPP	76.97109	29.51422	14:00:00	D	9.10

32	KARNAL	INDRI	S-NPP	77.10168	29.91784	14:00:00	D	2.40
33	KARNAL	KARNAL	S-NPP	76.91781	29.69627	12:18:00	D	4.90
34	KARNAL	KARNAL	S-NPP	76.89169	29.69635	12:18:00	D	7.40
35	KARNAL	KARNAL	S-NPP	76.79446	29.70015	14:00:00	D	3.40
36	KARNAL	KARNAL	AQUA	76.90800	29.72400	14:00:00	D	11.30
37	KARNAL	KARNAL	S-NPP	76.90474	29.73000	14:00:00	D	4.50
38	KARNAL	KARNAL	S-NPP	76.90704	29.73009	14:00:00	D	6.60
39	KARNAL	KARNAL	S-NPP	76.74879	29.74697	14:00:00	D	7.90
40	KARNAL	KARNAL	S-NPP	76.76063	29.76070	12:18:00	D	5.70
41	KARNAL	KARNAL	AQUA	76.99500	29.78800	14:00:00	D	10.10
42	KARNAL	KARNAL	S-NPP	76.99565	29.79793	14:00:00	D	14.80
43	KARNAL	KARNAL	S-NPP	77.00217	29.79849	14:00:00	D	14.80
44	KARNAL	NILOKHERI	S-NPP	76.94730	29.75862	14:00:00	D	4.00
45	KURUKSHETRA	PEHOWA	S-NPP	76.68567	30.01766	14:00:00	D	6.30
46	KURUKSHETRA	PEHOWA	S-NPP	76.61846	30.03866	14:00:00	D	5.40
47	KURUKSHETRA	PEHOWA	S-NPP	76.64396	30.09530	14:00:00	D	3.30
48	KURUKSHETRA	PEHOWA	S-NPP	76.64706	30.12533	14:00:00	D	4.10
49	KURUKSHETRA	PEHOWA	S-NPP	76.65077	30.12703	14:00:00	D	8.70
50	KURUKSHETRA	SHAHABAD	S-NPP	76.92811	30.13936	14:00:00	D	6.80
51	KURUKSHETRA	SHAHABAD	S-NPP	76.90314	30.18776	14:00:00	D	4.20
52	KURUKSHETRA	THANESAR	AQUA	76.73800	29.89900	14:00:00	D	10.80
53	KURUKSHETRA	THANESAR	S-NPP	76.80167	29.90690	12:18:00	D	8.00
54	KURUKSHETRA	THANESAR	S-NPP	76.74914	29.90772	14:00:00	D	8.20
55	KURUKSHETRA	THANESAR	S-NPP	76.74832	29.90862	14:00:00	D	3.30
56	KURUKSHETRA	THANESAR	S-NPP	76.79913	29.90930	12:18:00	D	10.00
57	KURUKSHETRA	THANESAR	S-NPP	76.84261	29.93592	14:00:00	D	7.90
58	KURUKSHETRA	THANESAR	S-NPP	76.84193	29.93619	14:00:00	D	6.20
59	KURUKSHETRA	THANESAR	S-NPP	76.90700	29.93645	14:00:00	D	3.80
60	KURUKSHETRA	THANESAR	S-NPP	76.90758	29.93661	14:00:00	D	4.00
61	KURUKSHETRA	THANESAR	S-NPP	76.89513	30.03639	14:00:00	D	3.10
62	KURUKSHETRA	THANESAR	S-NPP	76.83474	30.05158	14:00:00	D	2.10
63	KURUKSHETRA	THANESAR	S-NPP	76.80907	30.10954	14:00:00	D	2.90
64	KURUKSHETRA	THANESAR	S-NPP	76.84024	30.12224	14:00:00	D	4.60
65	PANCHKULA	PANCHKULA	S-NPP	76.92234	30.47566	14:00:00	D	6.40

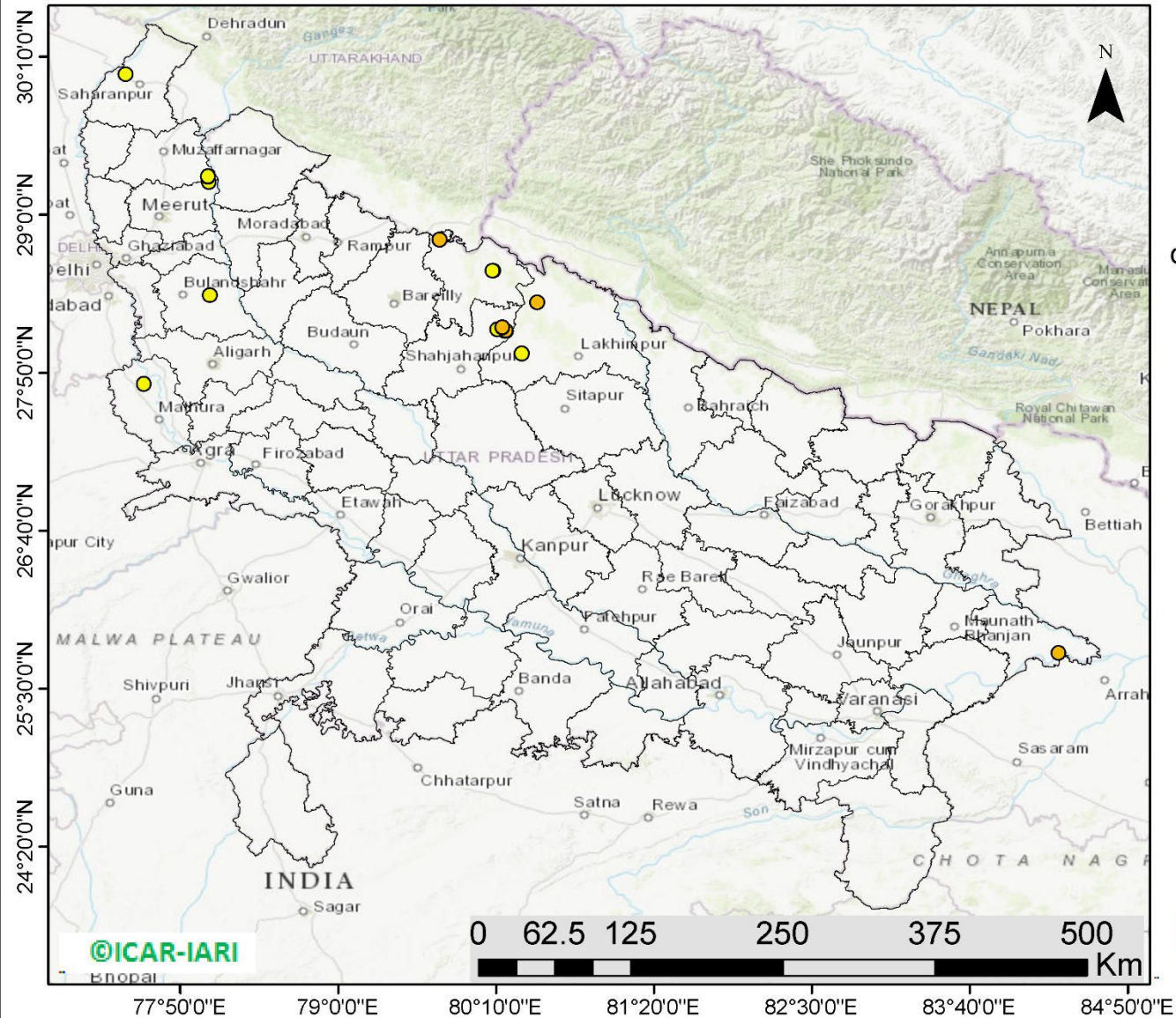
66	PANCHKULA	PANCHKULA	S-NPP	76.92209	30.47628	14:00:00	D	11.90
67	YAMUNANAGAR	JAGADHRI	S-NPP	77.12779	30.20097	14:00:00	D	4.40
68	YAMUNANAGAR	JAGADHRI	S-NPP	77.17704	30.34147	14:00:00	D	2.10
69	YAMUNANAGAR	JAGADHRI	S-NPP	77.21022	30.35445	14:00:00	D	6.20

District-wise cumulative number of residue burning events in Haryana (01 to 08-Oct 2019)



(c) UP

RICE RESIDUE BURNING IN UTTAR PRADESH



18 burning events detected in Uttar Pradesh on **08th October 2019**

Fire Intensity (W/m²)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



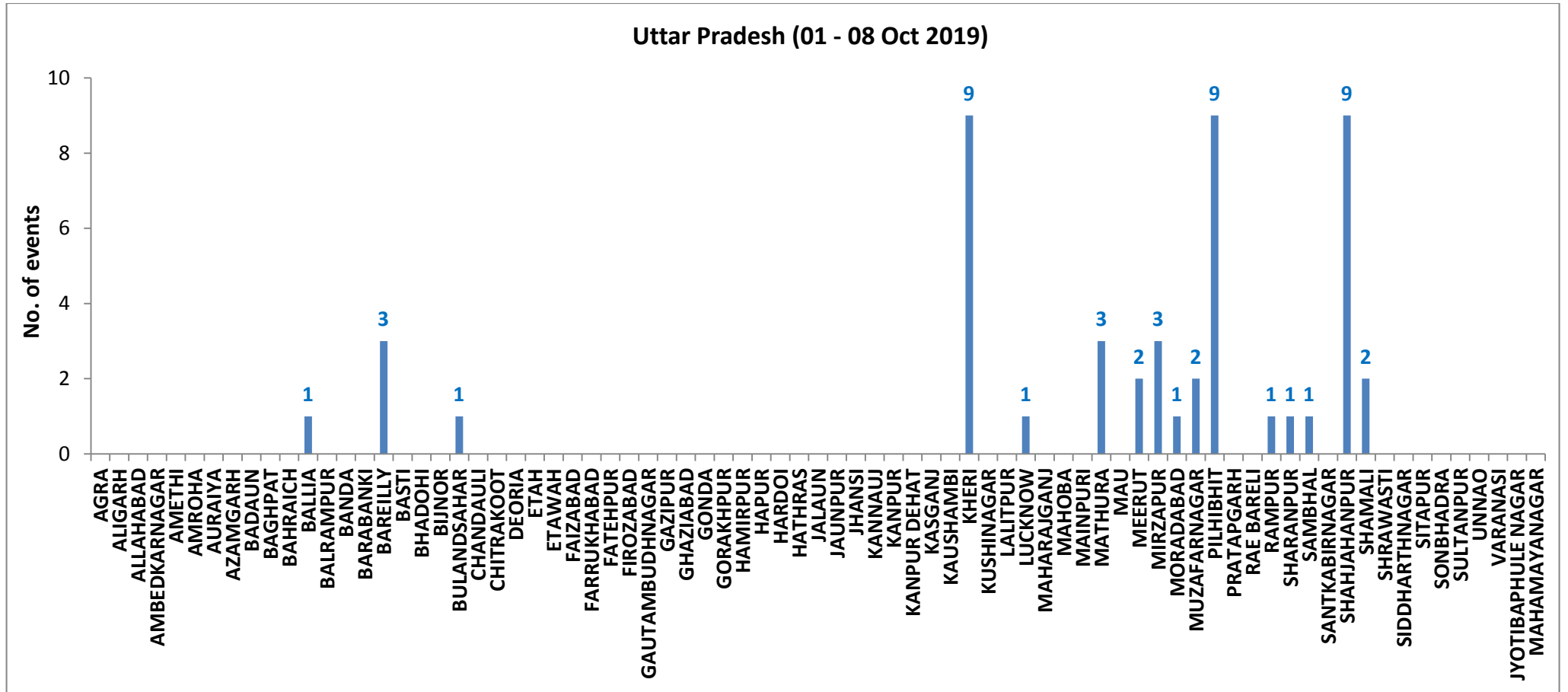
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

Details of residue burning events in Uttar Pradesh on 08-Oct-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	BALLIA	BALLIA	METOP-1	84.32470	25.76241	20:55:00	N	7.00
2	BULANDSAHAR	ANUP SHAHR	S-NPP	78.05375	28.40615	12:18:00	D	4.00
3	KHERI	GOLA	S-NPP	80.35641	27.97414	14:00:00	D	2.50
4	KHERI	MOHMADI	S-NPP	80.23859	28.14054	12:18:00	D	5.50
5	KHERI	PALIA KALAN	S-NPP	80.46947	28.34957	12:18:00	D	5.60
6	MATHURA	CHHATA	S-NPP	77.56393	27.75136	14:00:00	D	2.40
7	MEERUT	MAWANA	S-NPP	78.04714	29.24017	14:00:00	D	2.20
8	MUZAFARNAGAR	JANSATH	S-NPP	78.03904	29.28116	14:00:00	D	2.40
9	MUZAFARNAGAR	JANSATH	S-NPP	78.03938	29.28229	14:00:00	D	2.10
10	PILHIBHIT	PILHIBHIT	S-NPP	79.75085	28.81524	14:00:00	D	5.30
11	PILHIBHIT	PURANPUR	S-NPP	80.14543	28.58364	14:00:00	D	4.70
12	PILHIBHIT	PURANPUR	S-NPP	80.14320	28.58643	14:00:00	D	3.00
13	SHAHJAHANPUR	PUWANYA	S-NPP	80.23312	28.13910	12:18:00	D	5.50
14	SHAHJAHANPUR	PUWANYA	S-NPP	80.23540	28.14188	12:18:00	D	8.80
15	SHAHJAHANPUR	PUWANYA	S-NPP	80.17513	28.15091	14:00:00	D	5.00
16	SHAHJAHANPUR	PUWANYA	S-NPP	80.21327	28.16552	14:00:00	D	4.40
17	SHAHJAHANPUR	PUWANYA	S-NPP	80.21477	28.16866	14:00:00	D	6.60
18	SHARANPUR	SHARANPUR	S-NPP	77.42854	30.03455	14:00:00	D	2.20

District-wise cumulative number of residue burning events in Haryana (01 to 08-Oct 2019)

Uttar Pradesh (01 - 08 Oct 2019)



State-wise, date-wise and district-wise number of residue burning events detected in 2016, 2017, 2018 and 2019
(Period: 01-Oct to 08-Oct)

Date	Punjab				Haryana				UP				Total			
	2019	2018	2017	2016	2019	2018	2017	2016	2019	2018	2017	2016	2019	2018	2017	2016
01-Oct	3	16	54	109	1	9	13	46	1	11	2	23	5	36	69	178
02-Oct	20	9	50	51	2	23	27	16	0	21	8	20	23	53	85	87
03-Oct	37	4	62	66	16	9	40	16	3	12	17	16	56	25	119	98
04-Oct	3	32	103	37	30	16	60	7	4	5	22	15	37	53	185	59
05-Oct	16	56	106	95	37	30	68	15	11	10	20	14	64	96	194	124
06-Oct	0	87	138	152	22	63	75	105	8	13	39	6	30	163	252	263
07-Oct	27	162	105	171	16	180	97	126	4	69	33	24	47	411	235	321
08-Oct	59	39	215	166	69	40	218	94	18	54	76	14	146	133	509	274
Total	165	405	833	847	193	370	598	425	49	195	217	132	407	970	1648	1404

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

Study Team

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GIS Maps of fire events can be visualized online on ICAR KRISHI Geoportal website: <http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

(Part of KRISHI Portal: <https://krishi.icar.gov.in> initiative)
