



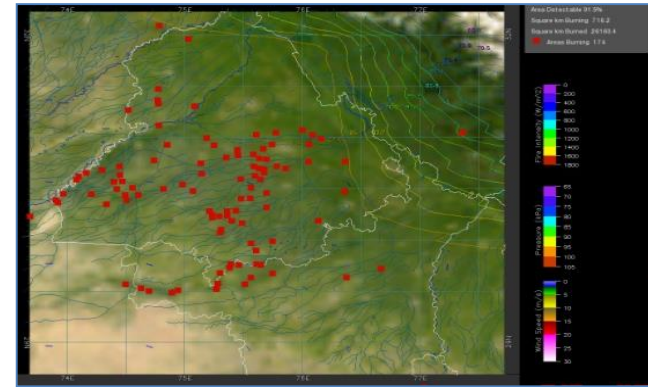
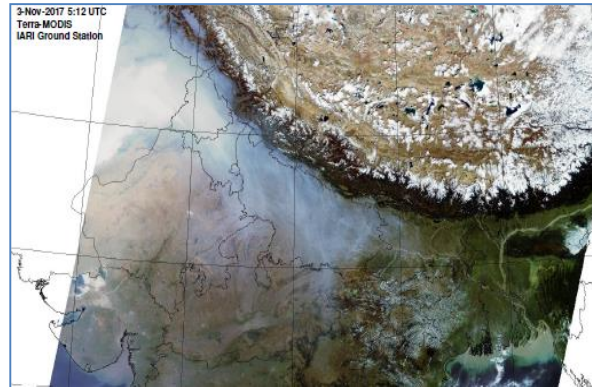
**Bulletin
No. 46**

**Events Date:
15-Nov-2019**

**Issued on:
16-Nov-2019**



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



Prepared by:

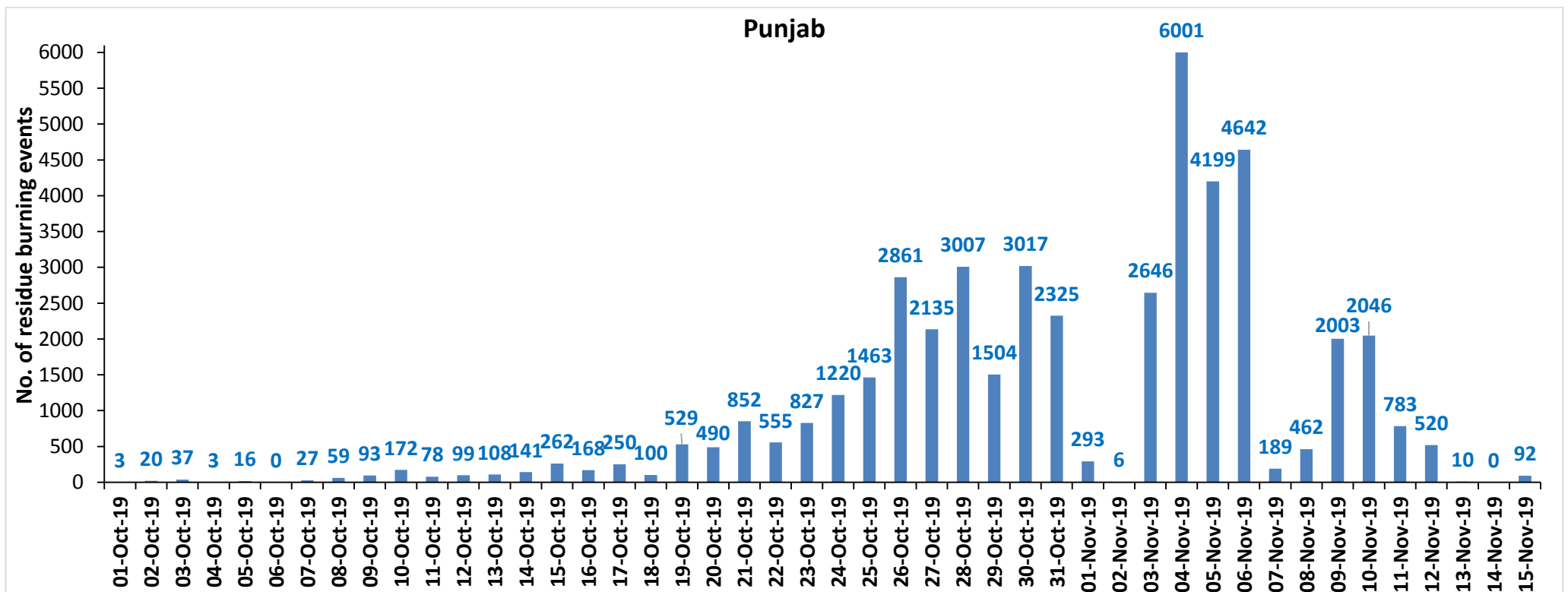
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

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

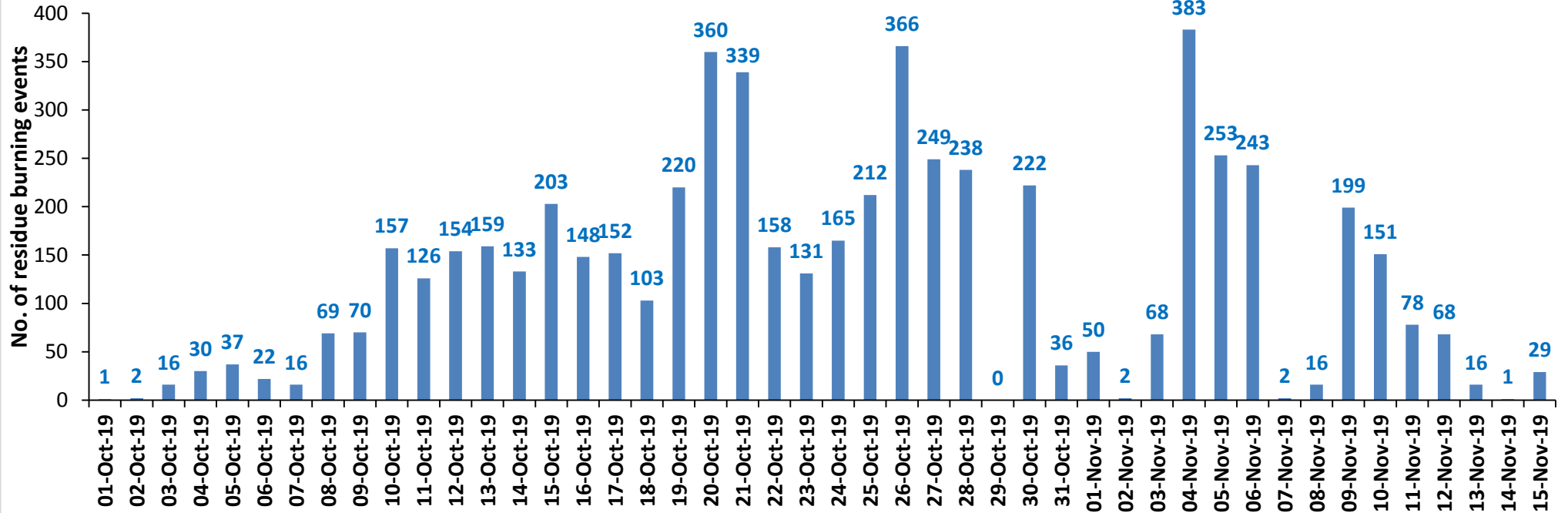
Highlights for 15-November-2019

- Satellites detected **232** residue burning events in the three study States on **15-Nov-2019**.
- The burning events detected on **15-Nov-2019** are **92**, **29** and **111** in Punjab, Haryana and UP, respectively.
- The state of Punjab was partially covered with clouds which prevented fire event detection by satellites.
- The number of events has increased from **23** on **14-Nov-2019** to **232** on **15-Nov-2019** in the three states.
- Total **55031** burning events were detected in the three States between **01-Oct-2019** and **15-Nov-2019**, which are distributed as **46313**, **5853** and **2865** in Punjab, Haryana and UP, respectively.
- Overall, the total burning events recorded in the three states are **15.8%** less than in 2018 till date. UP recorded **41.9%** reduction, Haryana recorded **19.3%** reduction, and Punjab recorded **12.9%** reduction, respectively, in the current season than in 2018.

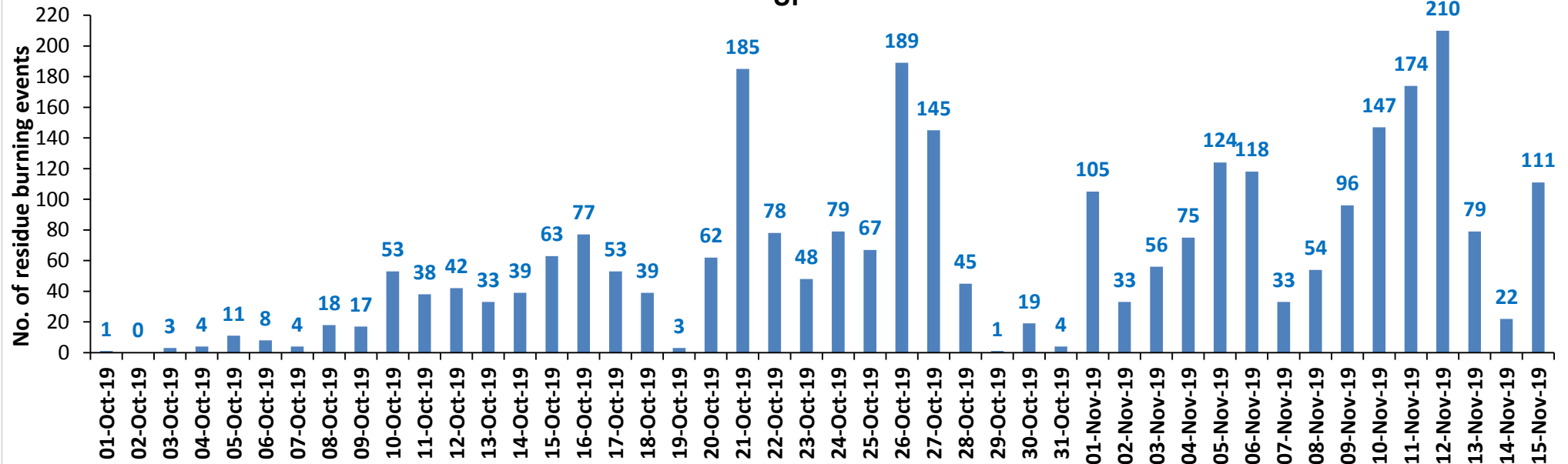
Temporal distribution of residue burning events for the three study States in 2019



Haryana

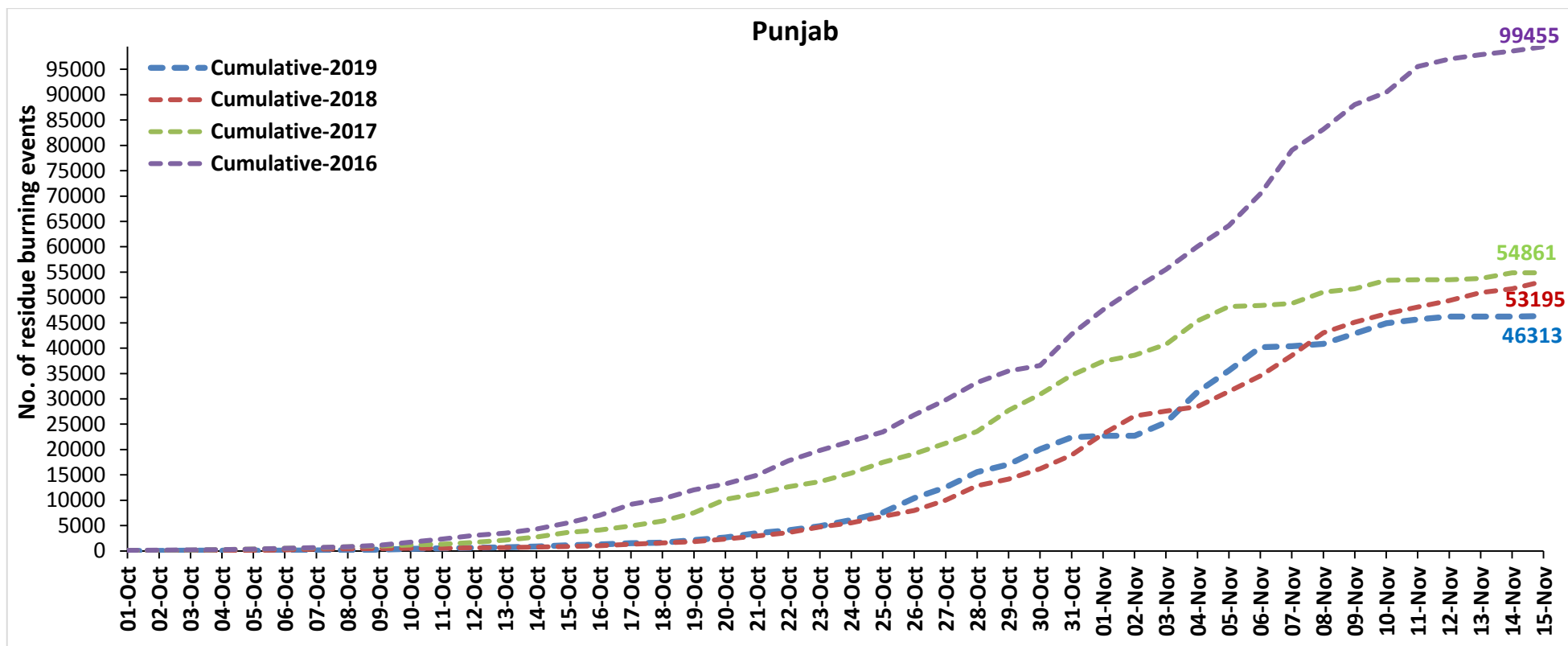


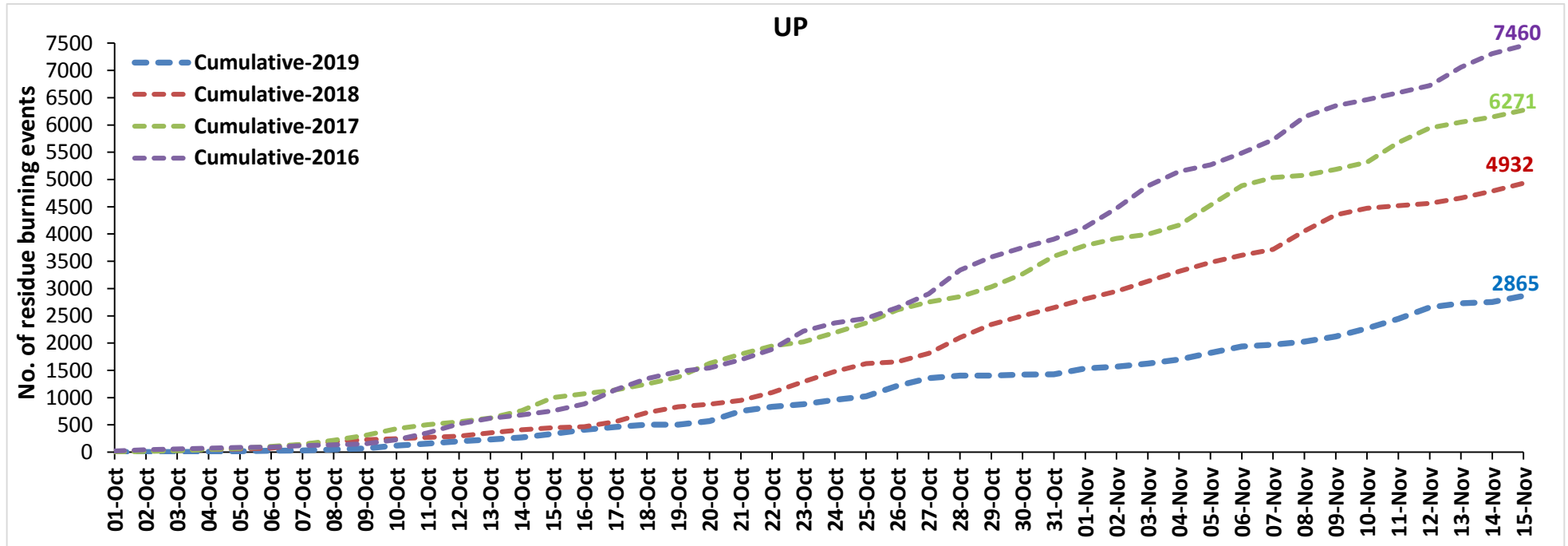
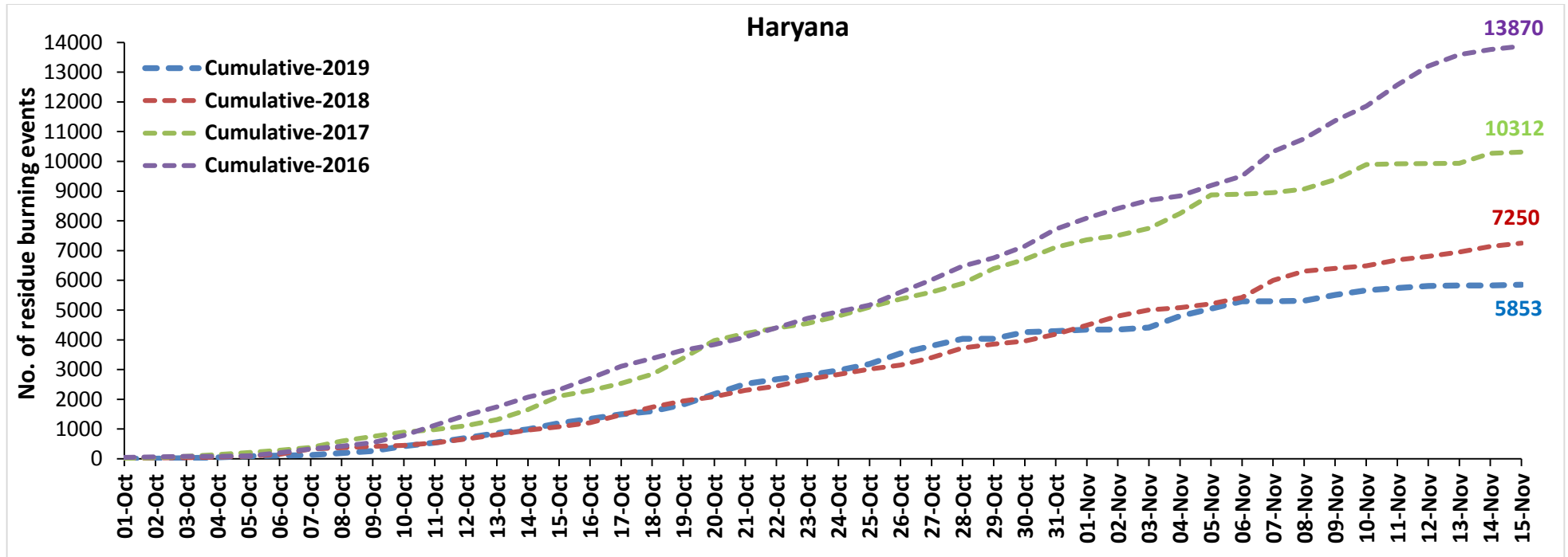
UP



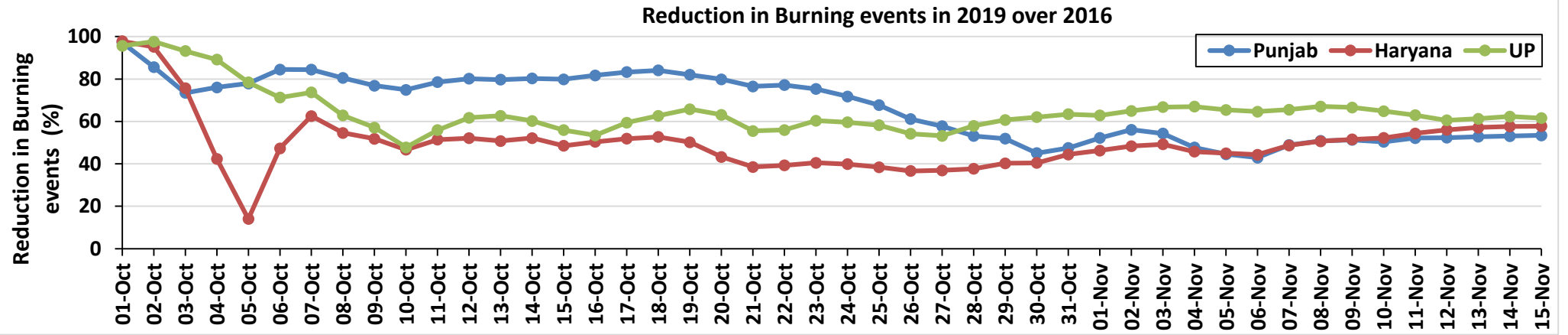
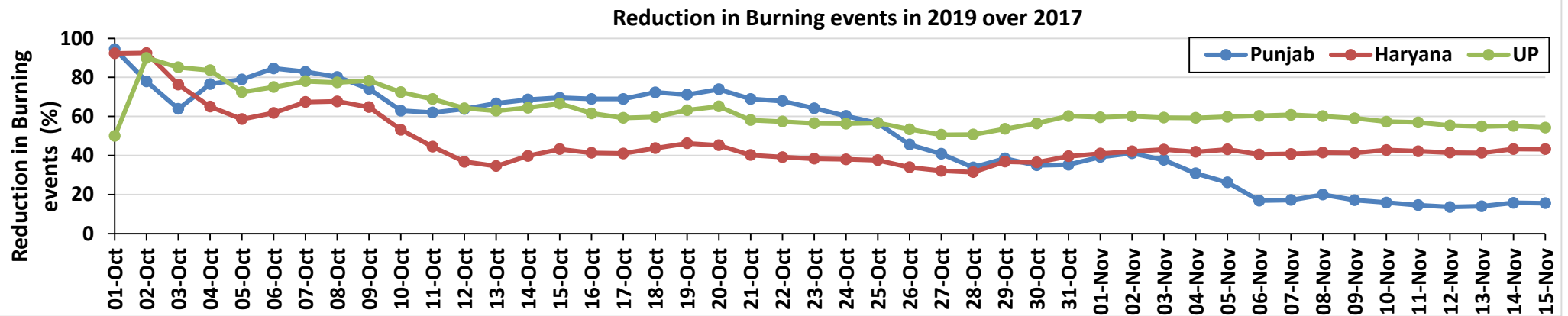
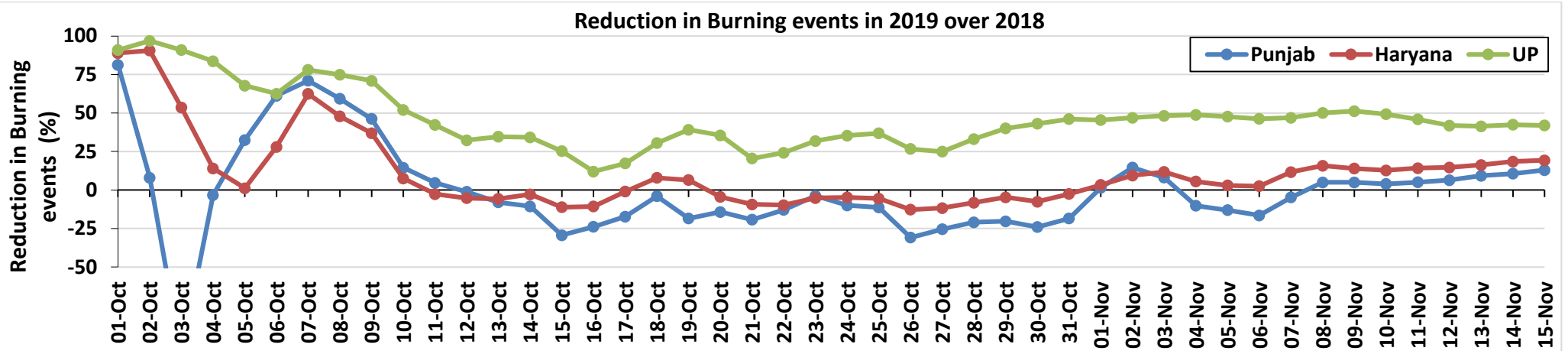
Comparison of residue burning events in current year (2019) with previous years (2018, 2017 & 2016) for the three study States

(01-Oct to 15-Nov)



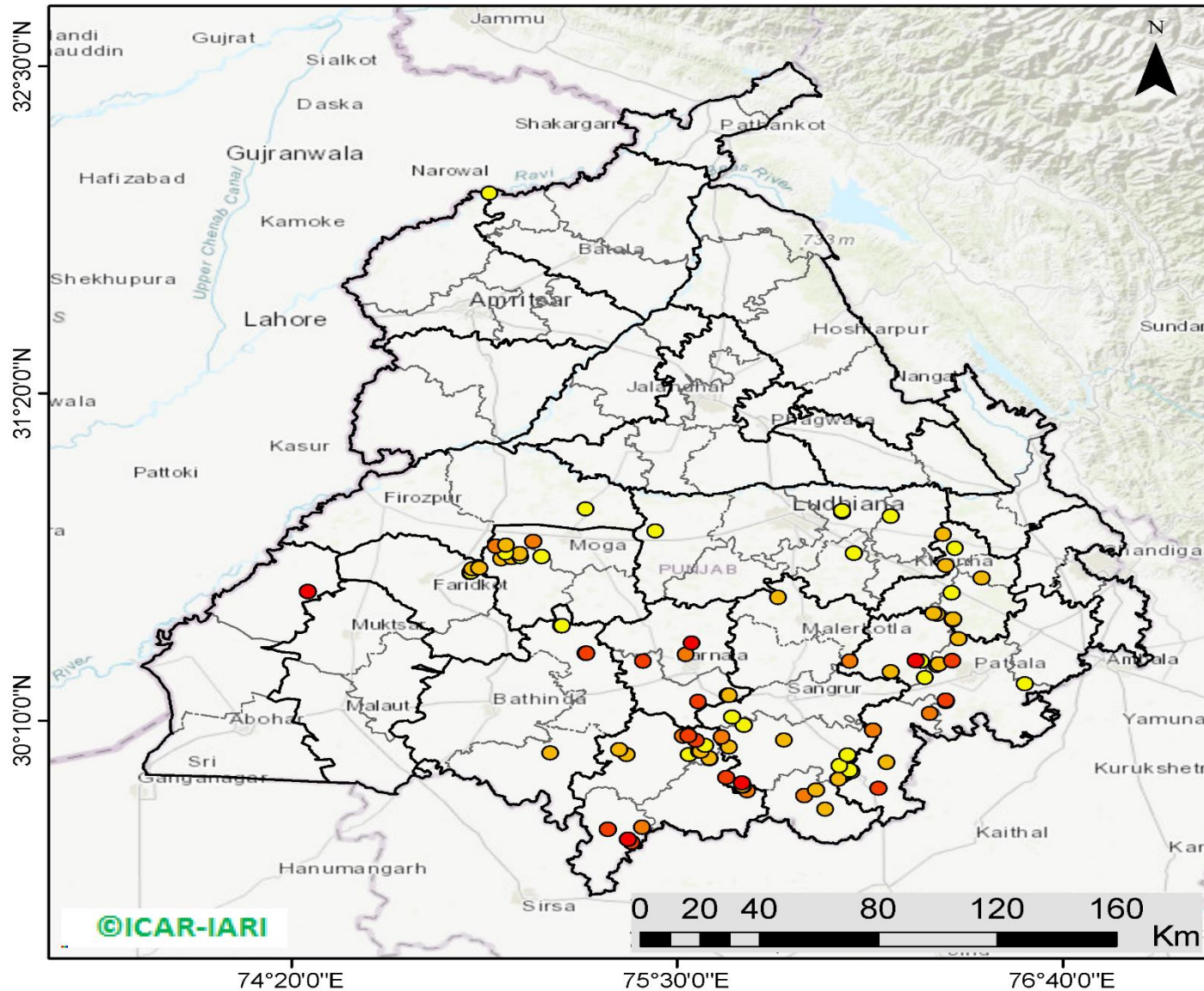


Percent Reduction in Burning events in 2019 over 2018, 2017 and 2016 (Daily Cumulative)




(a) Punjab

RICE RESIDUE BURNING IN PUNJAB



92 burning events detected in Punjab on 15th November 2019

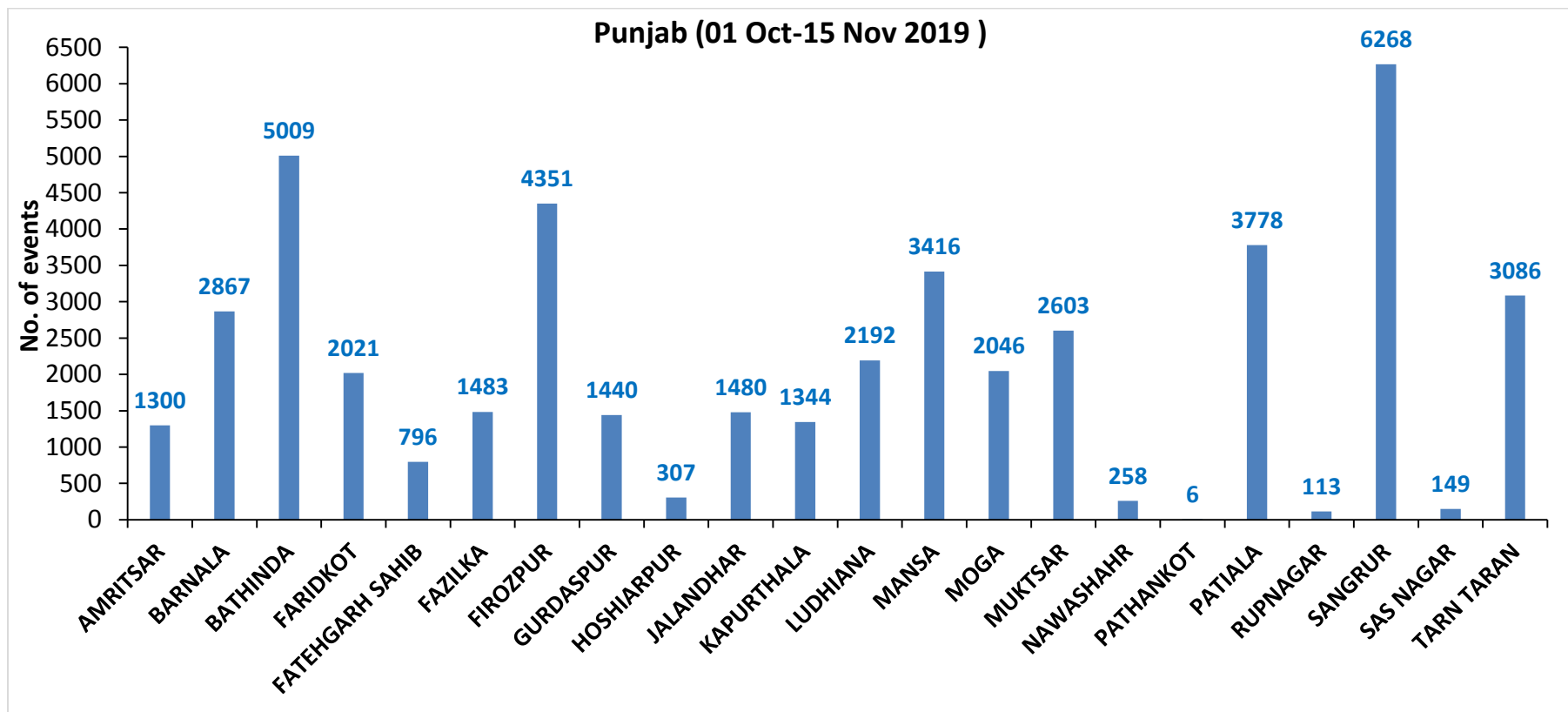
Fire Intensity (W/m²)

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



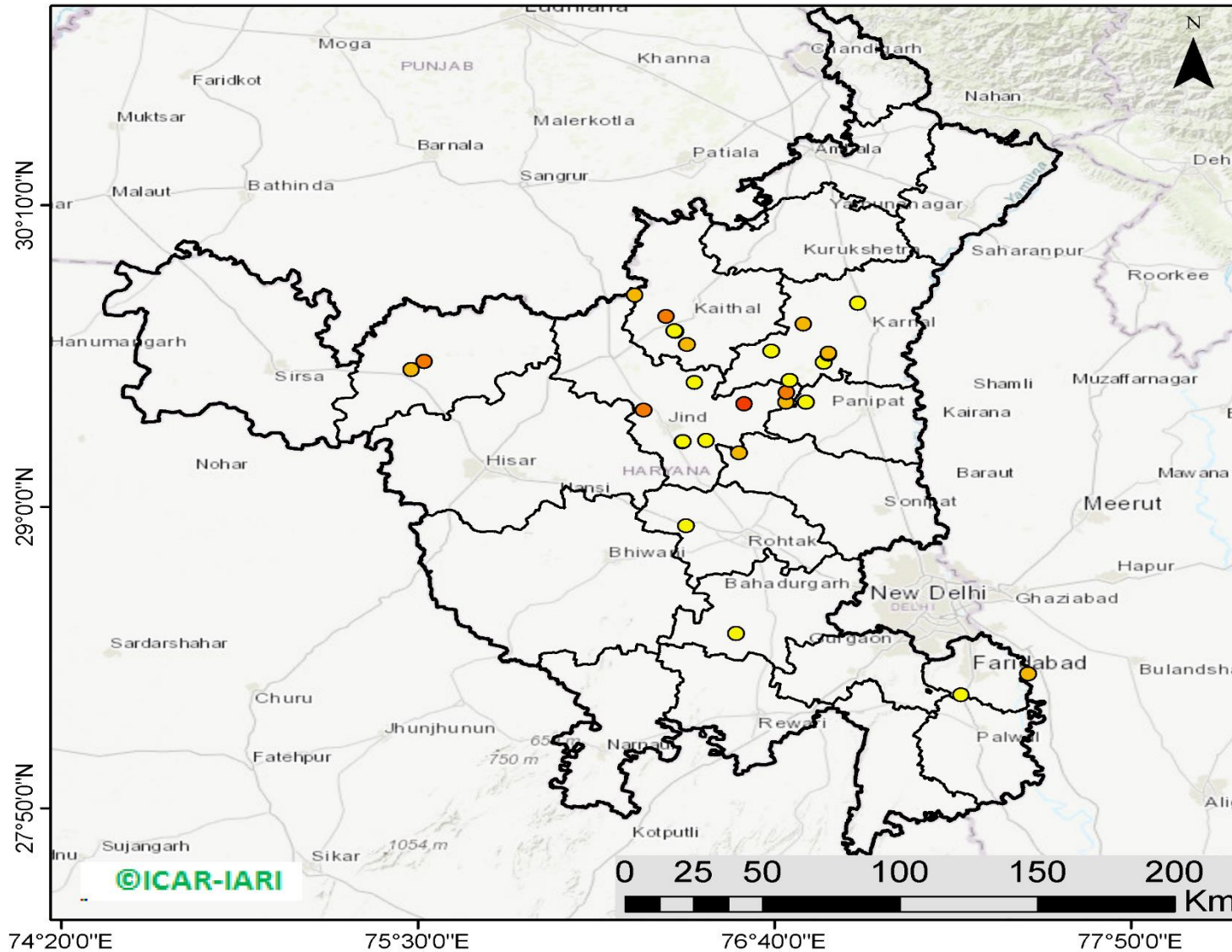
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (01 Oct to 15-Nov 2019)



(b) Haryana

RICE RESIDUE BURNING IN HARYANA



29 burning events detected in Haryana on 15th November 2019

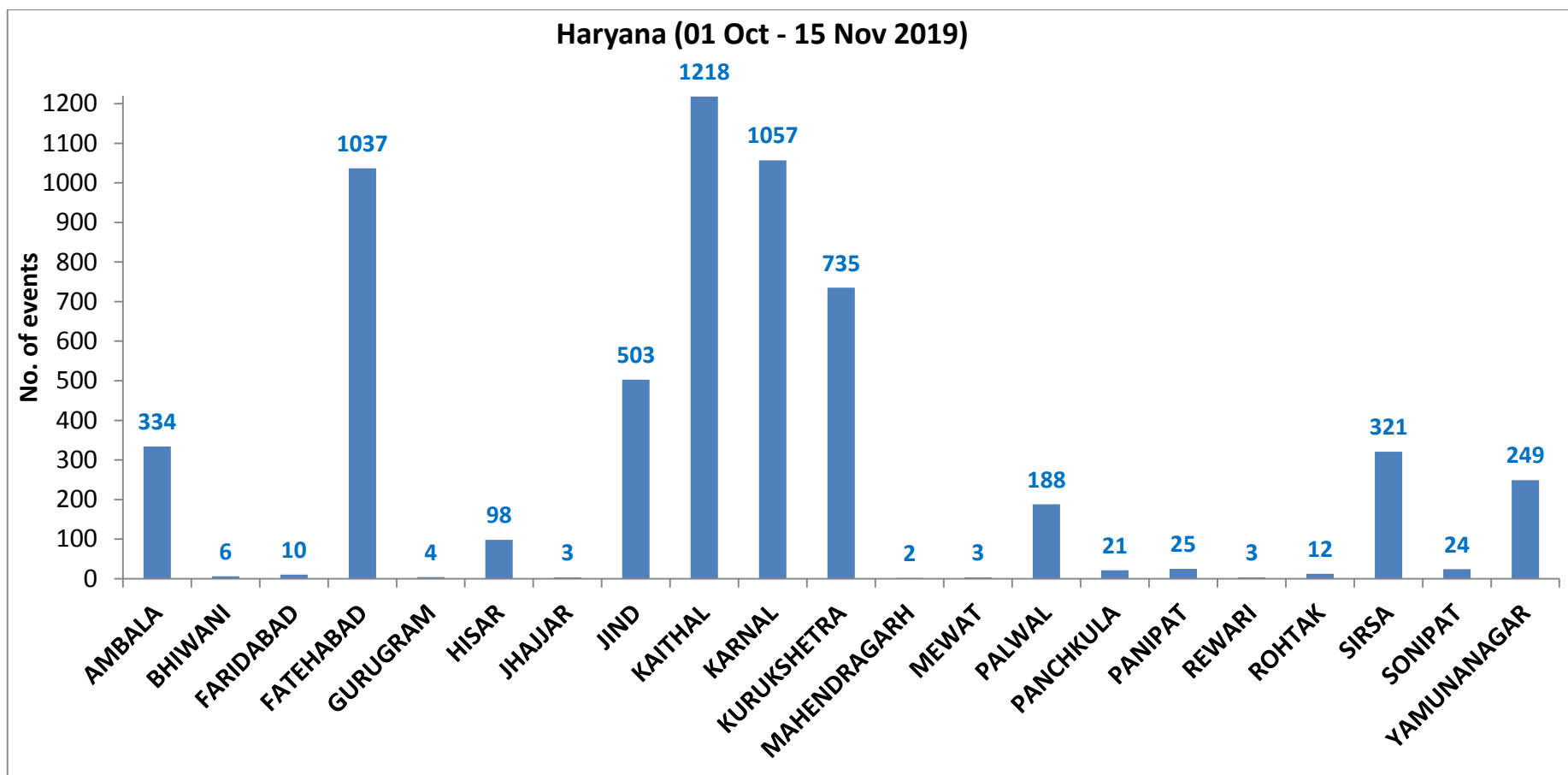
Fire Intensity (W/m²)

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



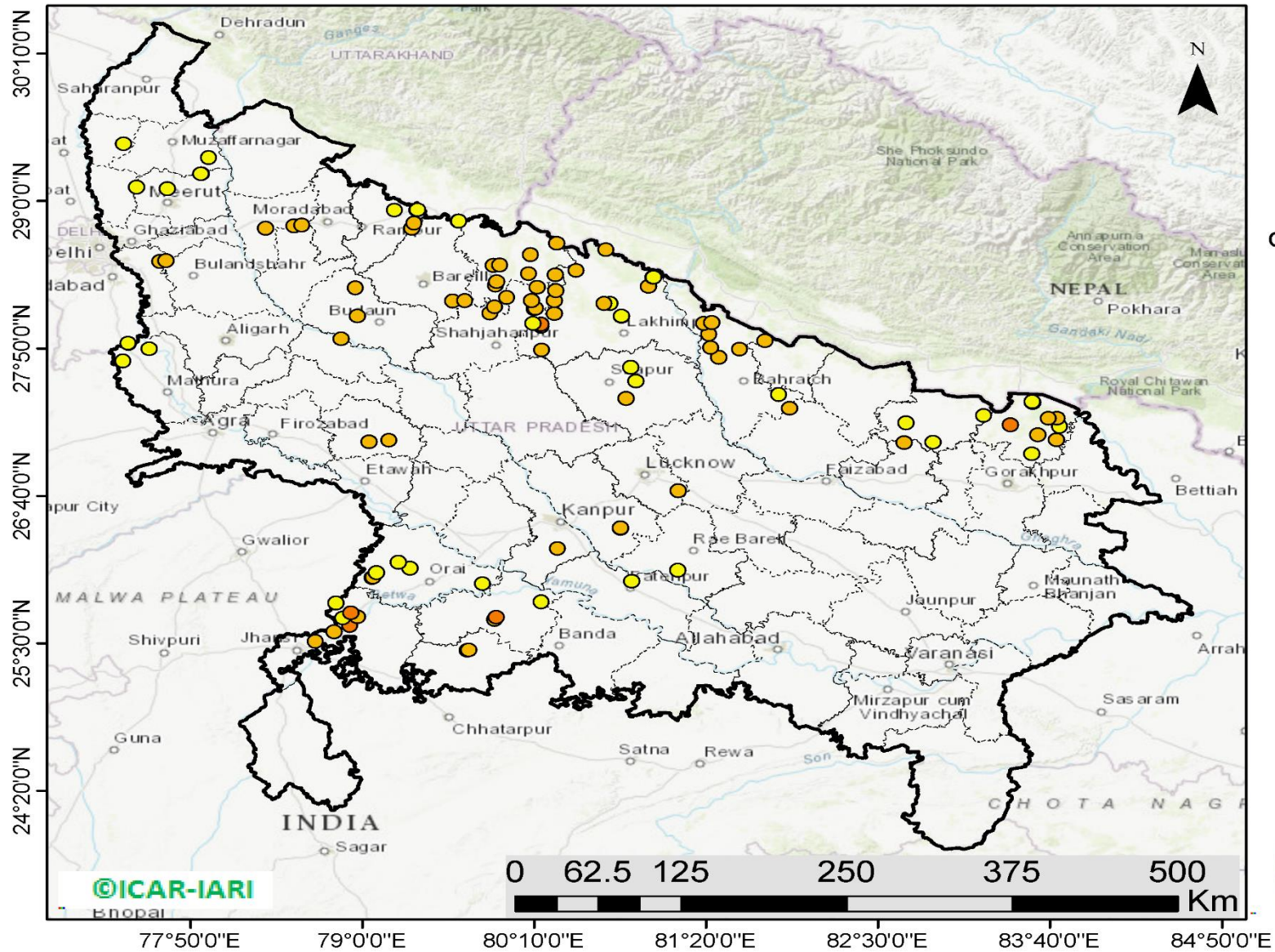
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (01 Oct to 15-Nov 2019)



(c) UP

RICE RESIDUE BURNING IN UTTAR PRADESH



111 burning events detected in Uttar Pradesh on 15th November 2019

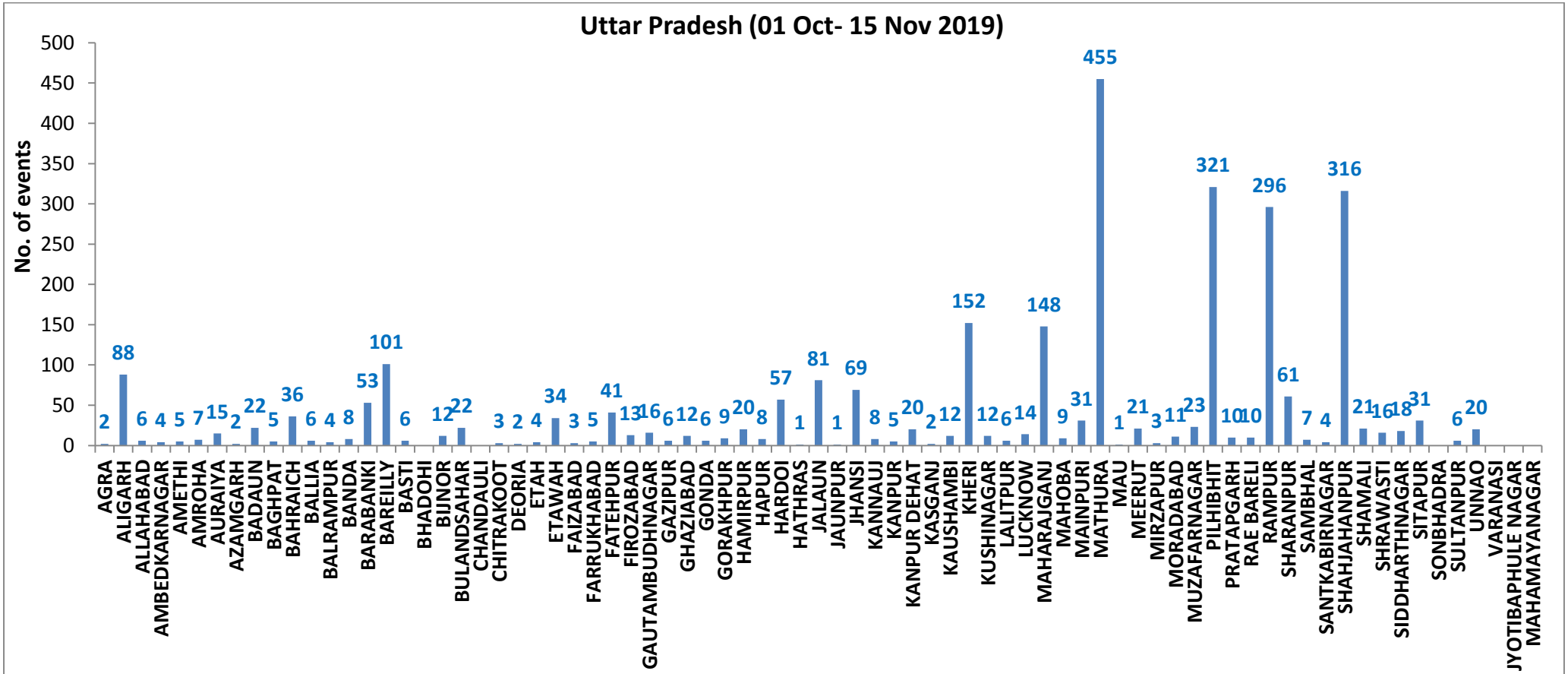
Fire Intensity (W/m²)

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



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

District-wise cumulative number of residues burning events in Uttar Pradesh (01 Oct to 15-Nov 2019)



State-wise, date-wise and district-wise number of residues burning events detected in 2016, 2017, 2018 and 2019
(Period: 01-Oct to 15-Nov)

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
09-Oct	93	75	163	270	70	47	148	121	17	32	88	22	180	154	399	413
10-Oct	172	23	164	597	157	37	151	242	53	21	126	74	382	81	441	913
11-Oct	78	30	177	652	126	78	87	336	38	24	74	128	242	131	338	1116
12-Oct	99	67	342	694	154	133	123	338	42	22	51	164	295	222	516	1196
13-Oct	108	62	470	467	159	147	207	284	33	61	69	102	300	270	746	853
14-Oct	141	112	582	812	133	153	333	328	39	57	137	60	313	322	1052	1200
15-Oct	262	90	943	1215	203	110	458	248	63	35	237	76	528	235	1638	1539
16-Oct	168	174	465	1478	148	138	186	385	77	20	71	125	393	332	722	1988
17-Oct	250	272	807	2173	152	268	244	399	53	94	69	261	455	634	1120	2833
18-Oct	100	263	970	1065	103	255	306	270	39	163	108	204	242	681	1384	1539
19-Oct	529	254	1591	1762	220	208	541	276	3	108	128	132	752	570	2260	2170
20-Oct	490	496	2653	1175	360	141	597	188	62	49	255	62	912	686	3505	1425
21-Oct	852	618	1139	1726	339	217	233	257	185	66	168	152	1376	901	1540	2135
22-Oct	555	656	1356	2837	158	134	186	309	78	149	151	194	791	939	1693	3340
23-Oct	827	1113	994	2040	131	232	155	313	48	193	72	331	1006	1538	1221	2684
24-Oct	1220	844	1714	1836	165	166	244	221	79	192	171	152	1464	1202	2129	2209
25-Oct	1463	1247	2104	1813	212	182	303	229	67	142	175	83	1742	1571	2582	2125
26-Oct	2861	1173	1715	3390	366	132	276	434	189	33	240	195	3416	1338	2231	4019
27-Oct	2135	2040	2069	2904	249	252	224	417	145	154	145	255	2529	2446	2438	3576
28-Oct	3007	2864	2318	3493	238	330	292	458	45	290	99	435	3290	3484	2709	4386
29-Oct	1504	1321	4184	2258	0	124	502	278	1	243	180	237	1505	1688	4866	2773
30-Oct	3017	2008	3152	1076	222	103	307	395	19	158	238	175	3258	2269	3697	1646
31-Oct	2325	2715	3743	6132	36	229	413	575	4	148	321	153	2365	3092	4477	6860
01-Nov	293	4140	2736	4843	50	306	250	362	105	161	199	223	448	4607	3185	5428
02-Nov	6	3550	1246	4183	2	306	145	332	33	142	131	345	41	3998	1522	4860

03-Nov	2646	972	2109	3806	68	202	240	275	56	181	75	409	2770	1355	2424	4490
04-Nov	6001	882	4603	4477	383	77	499	146	75	183	168	265	6459	1142	5270	4888
05-Nov	4199	2989	2876	4137	253	129	625	345	124	163	367	125	4576	3281	3868	4607
06-Nov	4642	3071	171	6303	243	222	26	322	118	130	357	215	5003	3423	554	6840
07-Nov	189	4033	420	8575	2	568	46	821	33	108	149	244	224	4709	615	9640
08-Nov	462	4450	2256	4129	16	313	128	432	54	338	43	419	532	5101	2427	4980
09-Nov	2003	2083	675	4857	199	199	311	608	96	294	107	205	2298	2473	1093	5670
10-Nov	2046	1675	1642	2468	151	85	509	484	147	125	131	109	2344	1885	2282	3061
11-Nov	783	1364	103	5040	78	196	29	716	174	45	358	129	1035	1605	490	5885
12-Nov	520	1256	33	1477	68	122	3	634	210	45	269	129	798	1423	305	2240
13-Nov	10	1563	237	885	16	146	7	389	79	94	109	338	105	1803	353	1612
14-Nov	0	765	1101	692	1	189	340	171	22	128	95	247	23	1082	1536	1110
15-Nov	92	1480	5	871	29	107	40	107	111	146	123	154	232	1733	168	1132
Total	46313	53195	54861	99455	5853	7250	10312	13870	2865	4932	6271	7460	55031	65377	71444	120785

(a) Punjab

Districts	01Oct-15 Nov			
	2016	2017	2018	2019
AMRITSAR	2056	1205	1136	1300
BARNALA	5644	2790	2911	2867
BATHINDA	8658	4750	5751	5009
FARIDKOT	4565	2862	2737	2021
FATEHGARH SAHIB	2446	1607	826	796
FAZILKA	0	0	0	1483
FIROZPUR	12750	5606	8340	4351
GURDASPUR	2145	1507	1090	1440
HOSHIARPUR	892	475	187	307
JALANDHAR	4611	1987	1281	1480
KAPURTHALA	3115	1526	708	1344
LUDHIANA	9253	3978	2328	2192
MANSA	5456	4082	3994	3416
MOGA	6352	1986	2413	2046
MUKTSAR	6535	3433	4880	2603
NAWASHAHR (SBS Nagar)	1582	792	337	258
PATHANKOT	0	0	0	6
PATIALA	6530	5006	4125	3778
RUPNAGAR	707	326	76	113
SANGRUR	11794	8222	7547	6268
SAS NAGAR	114	107	104	149
TARN TARAN	4250	2614	2424	3086
Total	99455	54861	53195	46313

(b) Haryana

Districts	01Oct-15 Nov			
	2016	2017	2018	2019
AMBALA	529	490	320	334
BHIWANI	55	27	13	6
FARIDABAD	278	341	183	10
FATEHABAD	4408	2954	1899	1037
GURUGRAM	0	0	0	4
HISAR	327	160	123	98
JHAJJAR	24	12	14	3
JIND	813	898	711	503
KAITHAL	1737	1491	1250	1218
KARNAL	1619	1484	831	1057
KURUKSHETRA	1075	1141	679	735
MAHENDRAGARH	0	0	0	2
MEWAT	0	0	0	3
PALWAL	0	0	0	188
PANCHKULA	0	0	3	21
PANIPAT	70	71	51	25
REWARI	0	0	0	3
ROHTAK	74	53	11	12
SIRSA	2553	831	956	321
SONIPAT	69	55	28	24
YAMUNANAGAR	239	304	178	249
Total	13870	10312	7250	5853

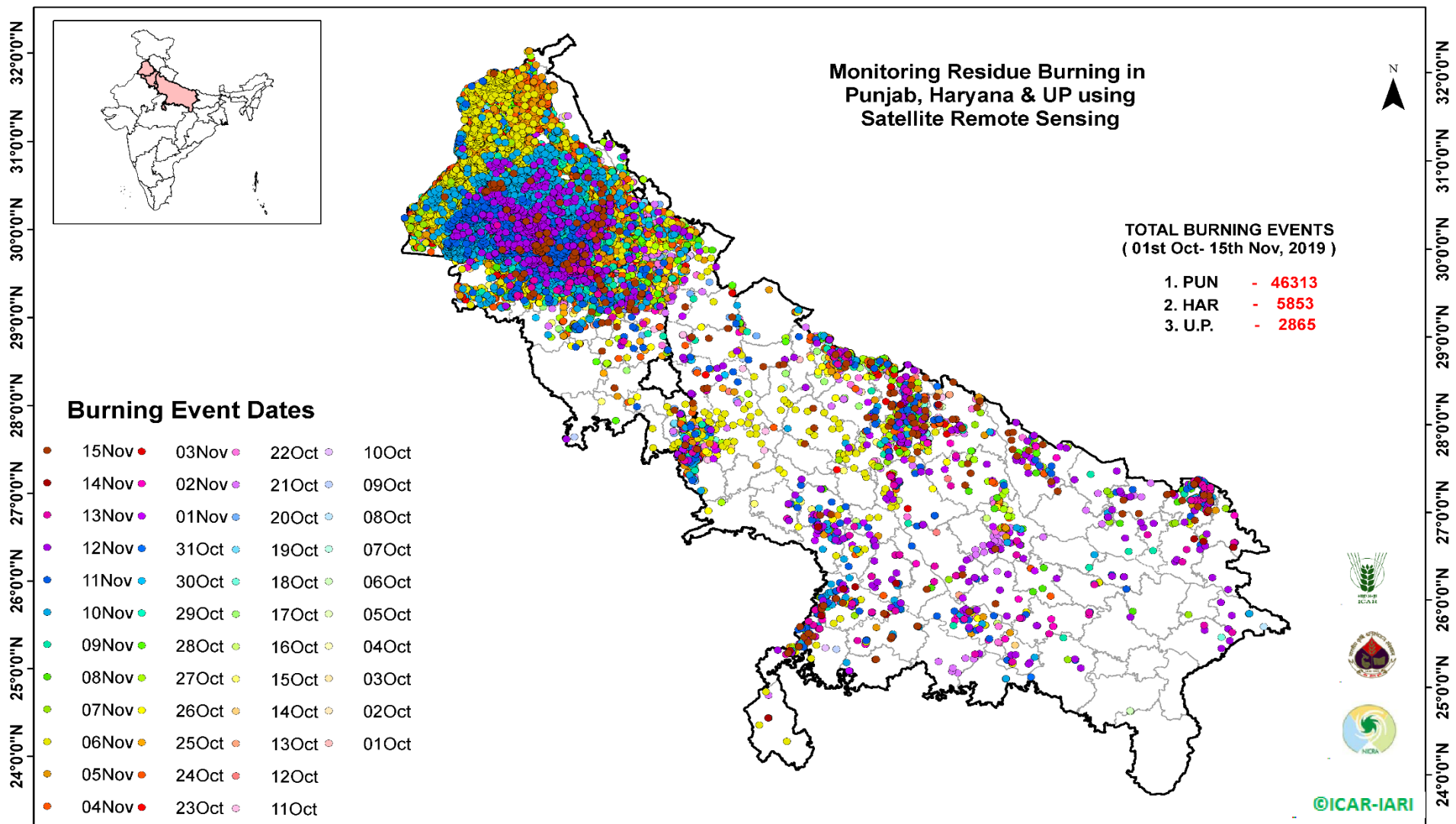
(c) Uttar Pradesh

Districts	01Oct-15 Nov			
	2016	2017	2018	2019
AGRA	0	0	0	2
ALIGARH	48	75	87	88
ALLAHABAD	3	8	10	6
AMBEDKARNAGAR	56	25	11	4
AMETHI	0	0	0	5
AMROHA	0	0	0	7
AURAIYA	173	125	46	15
AZAMGARH	26	19	20	2
BADAUN	6	6	9	22
BAGHPAT	0	0	0	5
BAHRAICH	55	35	57	36
BALLIA	5	15	10	6
BALRAMPUR	27	24	37	4
BANDA	1	10	8	8
BARABANKI	204	142	165	53
BAREILLY	234	191	114	101
BASTI	118	169	93	6
BHADOHI	0	0	0	0
BIJNOR	39	33	6	12
BULANDSAHAR	16	28	12	22
CHANDAULI	2	0	0	0
CHITRAKOOT	0	0	0	3
DEORIA	36	34	41	2
ETAH	16	26	24	4
ETAWAH	72	69	32	34
FAIZABAD	10	6	7	3
FARRUKHABAD	0	0	0	5
FATEHPUR	43	32	64	41
FIROZABAD	23	16	9	13

GAUTAMBUDHNAGAR	20	33	11	16
GAZIPUR	13	7	8	6
GHAZIABAD	58	35	24	12
GONDA	41	32	18	6
GORAKHPUR	46	59	60	9
HAMIRPUR	0	0	1	20
HAPUR	0	0	0	8
HARDOI	225	175	106	57
HATHRAS	0	0	0	1
JALAUN	0	0	0	81
JAUNPUR	10	6	14	1
JHANSI	0	0	2	69
KANNAUJ	21	12	6	8
KANPUR	9	6	8	5
KANPUR DEHAT	26	35	16	20
KASGANJ	0	0	0	2
KAUSHAMBI	15	30	32	12
KHERI	379	235	168	152
KUSHINAGAR	24	47	65	12
LALITPUR	0	0	0	6
LUCKNOW	53	30	26	14
MAHARAJGANJ	337	614	673	148
MAHOBA	0	0	0	9
MAINPURI	60	71	41	31
MATHURA	1420	1082	1046	455
MAU	10	5	9	1
MEERUT	51	52	12	21
MIRZAPUR	2	10	5	3
MORADABAD	39	27	11	11
MUZAFARNAGAR	102	101	31	23
PILHIBHIT	907	679	410	321
PRATAPGARH	25	28	20	10

RAE BARELI	47	36	29	10
RAMPUR	611	604	219	296
SHARANPUR	75	96	48	61
SAMBHAL	0	0	0	7
SANTKABIRNAGAR	49	55	43	4
SHAHJAHANPUR	1118	672	357	316
SHAMALI	0	0	0	21
SHRAWASTI	30	29	35	16
SIDDHARTHANAGAR	206	148	416	18
SITAPUR	105	58	33	31
SONBHADRA	14	9	9	0
SULTANPUR	40	18	15	6
UNNAO	48	34	33	20
VARANASI	1	0	0	0
JYOTIBAPHULE NAGAR	8	11	4	0
MAHAMAYANAGAR	2	2	6	0
Total	7460	6271	4932	2865

Map of Cumulative Burning Events (01 Oct – 15 Nov 2019)



[\(http://geoportal.icar.gov.in:8080/geoexplorer/composer/\)](http://geoportal.icar.gov.in:8080/geoexplorer/composer/)

Details of residue burning events in Punjab on 15-Nov-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	BARNALA	BARNALA	AQUA	75.52700	30.40300	13:20:00	D	13.00
2	BARNALA	BARNALA	AQUA	75.54500	30.44200	13:20:00	D	42.10
3	BARNALA	TAPPA	AQUA	75.56400	30.23500	13:20:00	D	16.80
4	BARNALA	TAPPA	S-NPP	75.65247	30.25697	13:48:00	D	5.30
5	BARNALA	TAPPA	S-NPP	75.65796	30.25759	13:48:00	D	5.30
6	BARNALA	TAPPA	AQUA	75.39800	30.37900	13:20:00	D	17.40
7	BATHINDA	RAMPURA PHUL	S-NPP	75.22360	30.40666	13:48:00	D	13.60
8	BATHINDA	RAMPURA PHUL	S-NPP	75.22639	30.40709	13:48:00	D	17.00
9	BATHINDA	RAMPURA PHUL	S-NPP	75.14958	30.50526	13:48:00	D	2.20
10	BATHINDA	RAMPURA PHUL	S-NPP	75.15240	30.50557	13:48:00	D	3.50
11	BATHINDA	TALWANDI SABO	TERRA	75.11700	30.05000	11:45:00	D	9.50
12	FARIDKOT	FARIDKOT	S-NPP	74.87510	30.69423	13:48:00	D	4.80
13	FARIDKOT	FARIDKOT	S-NPP	74.87711	30.69573	13:48:00	D	3.90
14	FARIDKOT	FARIDKOT	S-NPP	74.88044	30.70748	13:48:00	D	5.80
15	FARIDKOT	FARIDKOT	S-NPP	74.90094	30.70989	13:48:00	D	5.70
16	FATEHGARH SAHIB	ALMOH	S-NPP	76.31178	30.71944	13:48:00	D	5.10
17	FATEHGARH SAHIB	BASSI PATHANAN	S-NPP	76.42104	30.67414	13:48:00	D	5.40
18	FATEHGARH SAHIB	FATEHGARH SAHIB	S-NPP	76.33261	30.52541	13:48:00	D	5.70
19	FATEHGARH SAHIB	FATEHGARH SAHIB	S-NPP	76.33395	30.52829	13:48:00	D	6.60
20	FATEHGARH SAHIB	FATEHGARH SAHIB	S-NPP	76.32983	30.62279	13:48:00	D	3.90
21	FATEHGARH SAHIB	KHAMANOH	S-NPP	76.34017	30.78089	13:48:00	D	4.10
22	FATEHGARH SAHIB	KHAMANOH	S-NPP	76.30441	30.83002	13:48:00	D	5.30
23	FAZILKA	JALALABAD	TERRA	74.38300	30.62700	11:45:00	D	21.70
24	FIROZPUR	ZIRA	S-NPP	75.22370	30.92050	13:48:00	D	3.10
25	GURDASPUR	DERA BABA NANAK	S-NPP	74.93332	32.04596	13:48:00	D	5.00
26	LUDHIANA	JAGRAON	S-NPP	75.43523	30.84184	13:48:00	D	4.60
27	LUDHIANA	LUDHIANA EAST	S-NPP	75.99944	30.91082	13:48:00	D	5.20
28	LUDHIANA	LUDHIANA EAST	S-NPP	75.99886	30.91477	13:48:00	D	3.80
29	LUDHIANA	PAYAL	S-NPP	76.03502	30.76376	13:48:00	D	4.30
30	LUDHIANA	SAMRALA	S-NPP	76.14561	30.89493	13:48:00	D	4.20

31	MANSA	BUDHLADA	AQUA	75.71200	29.91500	13:20:00	D	14.10
32	MANSA	MANSA	S-NPP	75.59991	30.03060	13:48:00	D	2.30
33	MANSA	MANSA	S-NPP	75.59722	30.03265	13:48:00	D	8.40
34	MANSA	MANSA	AQUA	75.34700	30.04400	13:20:00	D	5.20
35	MANSA	MANSA	S-NPP	75.53502	30.04493	13:48:00	D	4.90
36	MANSA	MANSA	S-NPP	75.56615	30.05629	13:48:00	D	8.50
37	MANSA	MANSA	S-NPP	75.57154	30.05691	13:48:00	D	8.50
38	MANSA	MANSA	AQUA	75.32500	30.06300	13:20:00	D	7.80
39	MANSA	MANSA	S-NPP	75.58485	30.07789	13:48:00	D	4.70
40	MANSA	MANSA	AQUA	75.55600	30.09500	13:20:00	D	15.30
41	MANSA	MANSA	AQUA	75.63500	30.10900	13:20:00	D	14.10
42	MANSA	MANSA	AQUA	75.51800	30.11100	13:20:00	D	15.00
43	MANSA	MANSA	AQUA	75.53400	30.11300	13:20:00	D	15.10
44	MANSA	SARDULGARH	AQUA	75.36200	29.73300	13:20:00	D	18.40
45	MANSA	SARDULGARH	AQUA	75.35200	29.74300	13:20:00	D	40.70
46	MANSA	SARDULGARH	AQUA	75.29100	29.77900	13:20:00	D	15.10
47	MANSA	SARDULGARH	AQUA	75.39400	29.78600	13:20:00	D	13.70
48	MOGA	BAGHA PURANA	S-NPP	74.96891	30.74450	13:48:00	D	6.30
49	MOGA	BAGHA PURANA	S-NPP	74.99998	30.74819	13:48:00	D	8.50
50	MOGA	BAGHA PURANA	S-NPP	75.08982	30.75115	13:48:00	D	2.60
51	MOGA	BAGHA PURANA	S-NPP	75.02597	30.75126	13:48:00	D	2.70
52	MOGA	BAGHA PURANA	S-NPP	75.02420	30.76249	13:48:00	D	5.30
53	MOGA	BAGHA PURANA	S-NPP	74.98150	30.76501	13:48:00	D	5.00
54	MOGA	MOGA	S-NPP	74.95155	30.78803	13:48:00	D	14.60
55	MOGA	MOGA	S-NPP	74.98261	30.79178	13:48:00	D	5.50
56	MOGA	MOGA	S-NPP	75.06530	30.80558	13:48:00	D	12.20
57	PATIALA	NABHA	S-NPP	76.14605	30.33993	13:48:00	D	5.20
58	PATIALA	NABHA	S-NPP	76.23589	30.37812	13:48:00	D	4.30
59	PATIALA	NABHA	S-NPP	76.02274	30.37813	13:48:00	D	13.40
60	PATIALA	NABHA	AQUA	76.22100	30.38000	13:20:00	D	26.70
61	PATIALA	NABHA	S-NPP	76.28717	30.54493	13:48:00	D	5.80
62	PATIALA	NABHA	S-NPP	76.27464	30.54764	13:48:00	D	6.10
63	PATIALA	PATIALA	S-NPP	76.31258	30.23496	13:48:00	D	16.20

64	PATIALA	PATIALA	S-NPP	76.31200	30.23895	13:48:00	D	16.20
65	PATIALA	PATIALA	S-NPP	76.55140	30.29766	13:48:00	D	2.30
66	PATIALA	PATIALA	S-NPP	76.25043	30.31913	13:48:00	D	3.80
67	PATIALA	PATIALA	S-NPP	76.28613	30.36346	13:48:00	D	7.50
68	PATIALA	PATIALA	S-NPP	76.29150	30.36810	13:48:00	D	7.50
69	PATIALA	PATIALA	S-NPP	76.33207	30.38069	13:48:00	D	15.40
70	PATIALA	PATIALA	S-NPP	76.35030	30.45685	13:48:00	D	9.30
71	PATIALA	SAMANA	S-NPP	76.10908	29.92380	13:48:00	D	15.40
72	PATIALA	SAMANA	S-NPP	76.02892	29.98582	13:48:00	D	4.60
73	PATIALA	SAMANA	S-NPP	76.02266	29.98910	13:48:00	D	3.00
74	PATIALA	SAMANA	S-NPP	76.13465	30.01756	13:48:00	D	8.70
75	PATIALA	SAMANA	S-NPP	76.09251	30.13205	13:48:00	D	11.90
76	PATIALA	SAMANA	AQUA	76.26400	30.19100	13:20:00	D	13.60
77	SANGRUR	MALERKOTLA	AQUA	75.80600	30.60600	13:20:00	D	9.00
78	SANGRUR	MOONAK	METOP-1	75.94856	29.84975	21:09:00	N	6.00
79	SANGRUR	MOONAK	AQUA	75.88400	29.89900	13:20:00	D	11.30
80	SANGRUR	MOONAK	S-NPP	75.92029	29.91812	13:48:00	D	6.00
81	SANGRUR	SANGRUR	S-NPP	75.66659	30.17866	13:48:00	D	3.90
82	SANGRUR	SUNAM	S-NPP	75.69951	29.93152	13:48:00	D	8.30
83	SANGRUR	SUNAM	S-NPP	75.69749	29.93284	13:48:00	D	5.70
84	SANGRUR	SUNAM	S-NPP	75.69574	29.94435	13:48:00	D	35.80
85	SANGRUR	SUNAM	S-NPP	75.98708	29.95736	13:48:00	D	11.10
86	SANGRUR	SUNAM	S-NPP	75.98865	29.95772	13:48:00	D	5.70
87	SANGRUR	SUNAM	S-NPP	75.64876	29.96237	13:48:00	D	16.80
88	SANGRUR	SUNAM	S-NPP	75.99146	30.00546	13:48:00	D	1.60
89	SANGRUR	SUNAM	S-NPP	76.01459	30.04384	13:48:00	D	3.40
90	SANGRUR	SUNAM	S-NPP	75.65773	30.07075	13:48:00	D	5.10
91	SANGRUR	SUNAM	AQUA	75.82400	30.09600	13:20:00	D	9.90
92	SANGRUR	SUNAM	S-NPP	75.70146	30.15015	13:48:00	D	2.50

Details of residue burning events in Haryana on 15-Nov-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	FARIDABAD	BALLABGARH	S-NPP	77.27618	28.27171	02:30:00	N	0.80
2	FARIDABAD	BALLABGARH	S-NPP	77.49585	28.35419	13:48:00	D	9.70
3	FATEHABAD	FATEHABAD	METOP-1	75.47782	29.53085	21:09:00	N	9.50
4	FATEHABAD	FATEHABAD	METOP-1	75.52150	29.56229	21:09:00	N	12.00
5	JHAJJAR	JHAJJAR	S-NPP	76.54007	28.51070	13:48:00	D	3.90
6	JIND	JIND	S-NPP	76.36507	29.25031	13:48:00	D	4.60
7	JIND	JIND	S-NPP	76.36694	29.25181	13:48:00	D	2.60
8	JIND	JIND	S-NPP	76.44262	29.25653	13:48:00	D	3.90
9	JIND	JIND	AQUA	76.23800	29.37300	13:20:00	D	12.40
10	JIND	JIND	S-NPP	76.40501	29.48045	13:48:00	D	2.70
11	JIND	NARWANA	AQUA	76.21000	29.82000	13:20:00	D	9.40
12	JIND	SAFIDON	AQUA	76.56700	29.39900	13:20:00	D	16.20
13	JIND	SAFIDON	AQUA	76.70400	29.40600	13:20:00	D	8.80
14	JIND	SAFIDON	S-NPP	76.70579	29.44281	13:48:00	D	11.60
15	KAITHAL	KAITHAL	AQUA	76.38000	29.62800	13:20:00	D	7.10
16	KAITHAL	KAITHAL	S-NPP	76.34253	29.67955	13:48:00	D	4.40
17	KAITHAL	KAITHAL	S-NPP	76.33837	29.68058	13:48:00	D	2.90
18	KAITHAL	KAITHAL	AQUA	76.31200	29.73600	13:20:00	D	13.50
19	KARNAL	ASSANDH	S-NPP	76.71571	29.48903	13:48:00	D	3.30
20	KARNAL	ASSANDH	S-NPP	76.65608	29.60178	13:48:00	D	2.10
21	KARNAL	GHARAUNDA	S-NPP	76.82729	29.55893	13:48:00	D	2.10
22	KARNAL	KARNAL	S-NPP	76.84394	29.58969	13:48:00	D	2.90
23	KARNAL	KARNAL	S-NPP	76.84336	29.59377	13:48:00	D	5.70
24	KARNAL	KARNAL	S-NPP	76.76075	29.70792	13:48:00	D	5.90
25	KARNAL	NILOKHERI	S-NPP	76.93968	29.78890	13:48:00	D	3.00
26	PANIPAT	PANIPAT	S-NPP	76.76871	29.40444	13:48:00	D	4.40
27	PANIPAT	PANIPAT	S-NPP	76.76878	29.40483	13:48:00	D	4.80
28	ROHTAK	MAHAM	S-NPP	76.37670	28.92682	13:48:00	D	4.30
29	SONIPAT	GOHANA	S-NPP	76.55045	29.20808	13:48:00	D	5.90

Details of residue burning events in Uttar Pradesh on 15-Nov-2019

S. No.	District	Tehsil / Block	Satellite	Longitude	Latitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	AMROHA	AMROHA	NOAA-19	78.53586	28.80385	06:40:00	N	7.57
2	AMROHA	AMROHA	NOAA-19	78.58854	28.81070	06:40:00	N	7.00
3	AMROHA	HASANPUR	NOAA-19	78.34347	28.78300	06:40:00	N	6.00
4	BADAUN	BILSI	NOAA-19	78.96707	28.08905	06:40:00	N	7.86
5	BADAUN	BISAU LI	NOAA-19	78.95384	28.31281	06:40:00	N	6.45
6	BAHRAICH	BAHRAICH	AQUA	81.90000	27.35800	13:20:00	D	5.50
7	BAHRAICH	BAHRAICH	AQUA	81.82700	27.46800	13:20:00	D	5.00
8	BAHRAICH	NANPARA	NOAA-19	81.41845	27.76444	06:40:00	N	6.86
9	BAHRAICH	NANPARA	NOAA-19	81.56104	27.82585	06:40:00	N	7.47
10	BAHRAICH	NANPARA	NOAA-19	81.36576	27.83969	06:40:00	N	7.03
11	BAHRAICH	NANPARA	NOAA-19	81.35393	27.94656	06:40:00	N	7.11
12	BAHRAICH	NANPARA	NOAA-19	81.31751	28.03216	06:40:00	N	6.00
13	BAHRAICH	NANPARA	NOAA-19	81.37250	28.03815	06:40:00	N	6.00
14	BAREILLY	BAHERI	S-NPP	79.65110	28.84114	13:48:00	D	5.90
15	BAREILLY	BAHERI	S-NPP	79.65366	28.84233	13:48:00	D	5.00
16	BAREILLY	FARIDPUR	NOAA-19	79.61251	28.21032	06:40:00	N	6.00
17	BASTI	BHANPUR	AQUA	82.67700	27.08800	13:20:00	D	6.30
18	FATEHPUR	FATEHPUR	S-NPP	80.82778	25.98961	13:48:00	D	2.90
19	GAUTAMBUDHNAGAR	DADRI	NOAA-19	77.62403	28.52249	06:40:00	N	6.50
20	GAUTAMBUDHNAGAR	DADRI	NOAA-19	77.66649	28.52922	06:40:00	N	6.00
21	HAMIRPUR	HAMIRPUR	S-NPP	80.21443	25.82820	13:48:00	D	5.00
22	HAMIRPUR	MAUDAHA	AQUA	79.89700	25.68600	13:20:00	D	5.70
23	HAMIRPUR	MAUDAHA	AQUA	79.90900	25.70500	13:20:00	D	12.30
24	JALAUN	JALAUN	S-NPP	79.32420	26.09258	13:48:00	D	3.40
25	JALAUN	JALAUN	S-NPP	79.24401	26.14068	13:48:00	D	4.80
26	JALAUN	KALPI	S-NPP	79.81548	25.97155	13:48:00	D	1.80
27	JALAUN	KONCH	AQUA	79.06800	26.01800	13:20:00	D	5.90
28	JALAUN	KONCH	AQUA	79.07300	26.02200	13:20:00	D	6.10
29	JALAUN	KONCH	S-NPP	79.09560	26.06021	13:48:00	D	2.50
30	JHANSI	JHANSI	AQUA	78.68200	25.51400	13:20:00	D	9.40

31	JHANSI	MOTH	S-NPP	78.91570	25.64245	13:48:00	D	10.20
32	JHANSI	MOTH	S-NPP	78.86722	25.69954	13:48:00	D	3.70
33	JHANSI	MOTH	S-NPP	78.96655	25.70980	13:48:00	D	6.10
34	JHANSI	MOTH	AQUA	78.92100	25.73900	13:20:00	D	10.90
35	JHANSI	MOTH	S-NPP	78.82022	25.81870	13:48:00	D	2.40
36	JHANSI	TAHRAULI	S-NPP	78.80844	25.59114	13:48:00	D	5.60
37	KANPUR	GHATAMPUR	AQUA	80.32400	26.25000	13:20:00	D	8.20
38	KASGANJ	KASGANJ	NOAA-19	78.85546	27.90939	06:40:00	N	7.00
39	KHERI	GOLA	S-NPP	80.68246	28.18998	13:48:00	D	2.00
40	KHERI	GOLA	NOAA-19	80.64133	28.19011	06:40:00	N	6.50
41	KHERI	GOLA	NOAA-19	80.30284	28.21257	06:40:00	N	6.00
42	KHERI	LAKHIMPUR	S-NPP	80.75763	28.08565	13:48:00	D	4.20
43	KHERI	LAKHIMPUR	S-NPP	80.75716	28.08856	13:48:00	D	4.10
44	KHERI	MOHMADI	NOAA-19	80.21622	27.81866	06:40:00	N	6.50
45	KHERI	MOHMADI	NOAA-19	80.21427	28.00820	06:40:00	N	6.00
46	KHERI	MOHMADI	AQUA	80.20400	28.02300	13:20:00	D	5.60
47	KHERI	MOHMADI	AQUA	80.21400	28.02500	13:20:00	D	14.40
48	KHERI	MOHMADI	NOAA-19	80.30163	28.10702	06:40:00	N	6.00
49	KHERI	NIGHASAN	NOAA-19	80.94051	28.32156	06:40:00	N	6.99
50	KHERI	NIGHASAN	S-NPP	80.97179	28.39566	13:48:00	D	2.80
51	KHERI	NIGHASAN	S-NPP	80.97530	28.39595	13:48:00	D	4.20
52	KHERI	PALIA KALAN	NOAA-19	80.45013	28.44927	06:40:00	N	7.00
53	KHERI	PALIA KALAN	NOAA-19	80.65280	28.61416	06:40:00	N	9.32
54	LUCKNOW	MOHANLAL GANJ	AQUA	81.14500	26.70600	13:20:00	D	5.10
55	MAHARAJGANJ	MAHARAJGANJ	S-NPP	83.54234	26.99751	12:06:00	D	4.10
56	MAHARAJGANJ	MAHARAJGANJ	AQUA	83.58400	27.15100	13:20:00	D	7.10
57	MAHARAJGANJ	NAUTANWA	AQUA	83.39900	27.22800	13:20:00	D	11.50
58	MAHARAJGANJ	NAUTANWA	S-NPP	83.54871	27.40579	12:06:00	D	2.40
59	MAHARAJGANJ	NAUTANWA	S-NPP	83.54537	27.40874	12:06:00	D	6.20
60	MAHARAJGANJ	NAUTANWA	S-NPP	83.54676	27.41195	12:06:00	D	3.90
61	MAHARAJGANJ	NICHLAUL	S-NPP	83.71072	27.10810	13:48:00	D	7.50
62	MAHARAJGANJ	NICHLAUL	S-NPP	83.73445	27.21480	13:48:00	D	2.10
63	MAHARAJGANJ	NICHLAUL	AQUA	83.71500	27.27800	13:20:00	D	6.30

64	MAHARAJGANJ	NICHLAUL	AQUA	83.65800	27.28000	13:20:00	D	6.70
65	MAHOBA	CHARKHARI	AQUA	79.71100	25.44400	13:20:00	D	4.90
66	MAHOBA	CHARKHARI	AQUA	79.72200	25.44600	13:20:00	D	6.80
67	MAINPURI	BHOGAON	S-NPP	79.17944	27.10473	13:48:00	D	5.50
68	MAINPURI	KARHAL	AQUA	79.04600	27.09400	13:20:00	D	5.90
69	MATHURA	CHHATA	S-NPP	77.37467	27.73348	13:48:00	D	2.80
70	MATHURA	CHHATA	S-NPP	77.55367	27.83061	13:48:00	D	3.70
71	MATHURA	CHHATA	S-NPP	77.41238	27.87216	13:48:00	D	4.60
72	MATHURA	CHHATA	S-NPP	77.41149	27.87376	13:48:00	D	3.10
73	MEERUT	MAWANA	S-NPP	77.90720	29.21318	13:48:00	D	4.40
74	MEERUT	MAWANA	S-NPP	77.90506	29.21452	13:48:00	D	3.90
75	MEERUT	SARDHANA	S-NPP	77.67531	29.09774	13:48:00	D	1.90
76	MEERUT	SARDHANA	S-NPP	77.46590	29.11033	13:48:00	D	3.20
77	MUZAFARNAGAR	JANSATH	S-NPP	77.95624	29.34327	13:48:00	D	2.40
78	PILHIBHIT	BISALPUR	NOAA-19	79.98174	28.23735	06:40:00	N	8.41
79	PILHIBHIT	BISALPUR	NOAA-19	79.90369	28.33159	06:40:00	N	6.00
80	PILHIBHIT	BISALPUR	NOAA-19	79.91048	28.36034	06:40:00	N	6.00
81	PILHIBHIT	BISALPUR	NOAA-19	79.88913	28.48880	06:40:00	N	6.00
82	PILHIBHIT	PURANPUR	NOAA-19	80.30780	28.41326	06:40:00	N	6.82
83	PILHIBHIT	PURANPUR	NOAA-19	80.12919	28.42292	06:40:00	N	6.57
84	PILHIBHIT	PURANPUR	NOAA-19	79.93227	28.49229	06:40:00	N	6.44
85	PILHIBHIT	PURANPUR	NOAA-19	80.14217	28.57607	06:40:00	N	6.64
86	PILHIBHIT	PURANPUR	NOAA-19	80.31831	28.66341	06:40:00	N	7.13
87	RAIBEARELI	DALMAU	S-NPP	81.14208	26.07904	13:48:00	D	2.60
88	RAMPUR	BILASPUR	NOAA-19	79.33589	28.78375	06:40:00	N	6.00
89	RAMPUR	BILASPUR	NOAA-19	79.35288	28.82567	06:40:00	N	7.00
90	RAMPUR	BILASPUR	S-NPP	79.37195	28.92759	13:48:00	D	3.30
91	RAMPUR	BILASPUR	S-NPP	79.21872	28.92801	13:48:00	D	4.80
92	RAMPUR	BILASPUR	S-NPP	79.37239	28.93100	13:48:00	D	3.60
93	SHAHJAHANPUR	PUWANYA	S-NPP	80.15839	28.03336	13:48:00	D	2.80
94	SHAHJAHANPUR	PUWANYA	AQUA	80.16700	28.14700	13:20:00	D	5.00
95	SHAHJAHANPUR	PUWANYA	AQUA	80.17800	28.14800	13:20:00	D	6.60
96	SHAHJAHANPUR	PUWANYA	S-NPP	80.14962	28.21329	13:48:00	D	5.40

97	SHAHJAHANPUR	PUWANYA	NOAA-19	80.31365	28.29058	06:40:00	N	6.39
98	SHAHJAHANPUR	PUWANYA	S-NPP	80.18590	28.31730	13:48:00	D	7.30
99	SHAHJAHANPUR	TILHAR	NOAA-19	79.86648	28.11101	06:40:00	N	6.00
100	SHAHJAHANPUR	TILHAR	NOAA-19	79.89716	28.16030	06:40:00	N	7.03
101	SHAHJAHANPUR	TILHAR	AQUA	79.69700	28.21300	13:20:00	D	6.40
102	SHAMLI	SHAMLI	S-NPP	77.37931	29.45099	13:48:00	D	2.40
103	SHRAWASTI	BHINGA	NOAA-19	81.73096	27.89208	06:40:00	N	7.00
104	SIDDHARTHANAGAR	BANSI	S-NPP	82.87287	27.08869	00:54:00	N	0.50
105	SIDDHARTHANAGAR	DOMARIYAGANJ	S-NPP	82.69045	27.24505	13:48:00	D	2.70
106	SIDDHARTHANAGAR	NAUGARH	S-NPP	83.21802	27.30132	13:48:00	D	2.60
107	SITAPUR	LAHARPUR	S-NPP	80.85749	27.57352	13:48:00	D	1.90
108	SITAPUR	LAHARPUR	S-NPP	80.82251	27.68362	13:48:00	D	3.10
109	SITAPUR	SITAPUR	AQUA	80.78900	27.43700	13:20:00	D	5.20
110	UNNAO	PURWA	S-NPP	80.75076	26.41112	13:48:00	D	9.20
111	UNNAO	PURWA	S-NPP	80.75306	26.41171	13:48:00	D	7.30

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 website: <http://geoportal.icar.gov.in:8080/geoexplorer/composer/>
(Part of KRISHI Portal: <https://krishi.icar.gov.in> initiative)
