



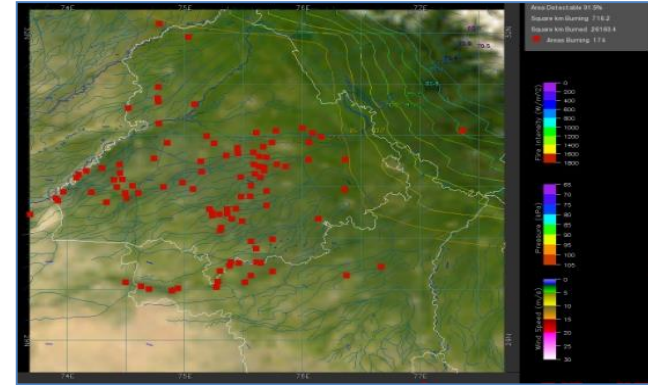
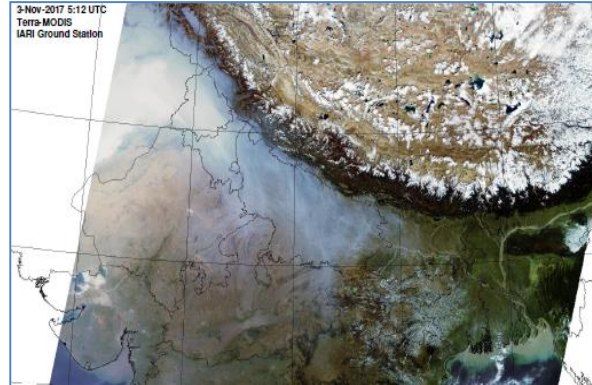
**Bulletin
No. 47**

**Events Date:
16-Nov-2020**

**Issued on:
17-Nov-2020**



MONITORING PADDY RESIDUE BURNING IN NORTH INDIA USING SATELLITE REMOTE SENSING DURING 2020



Prepared by:

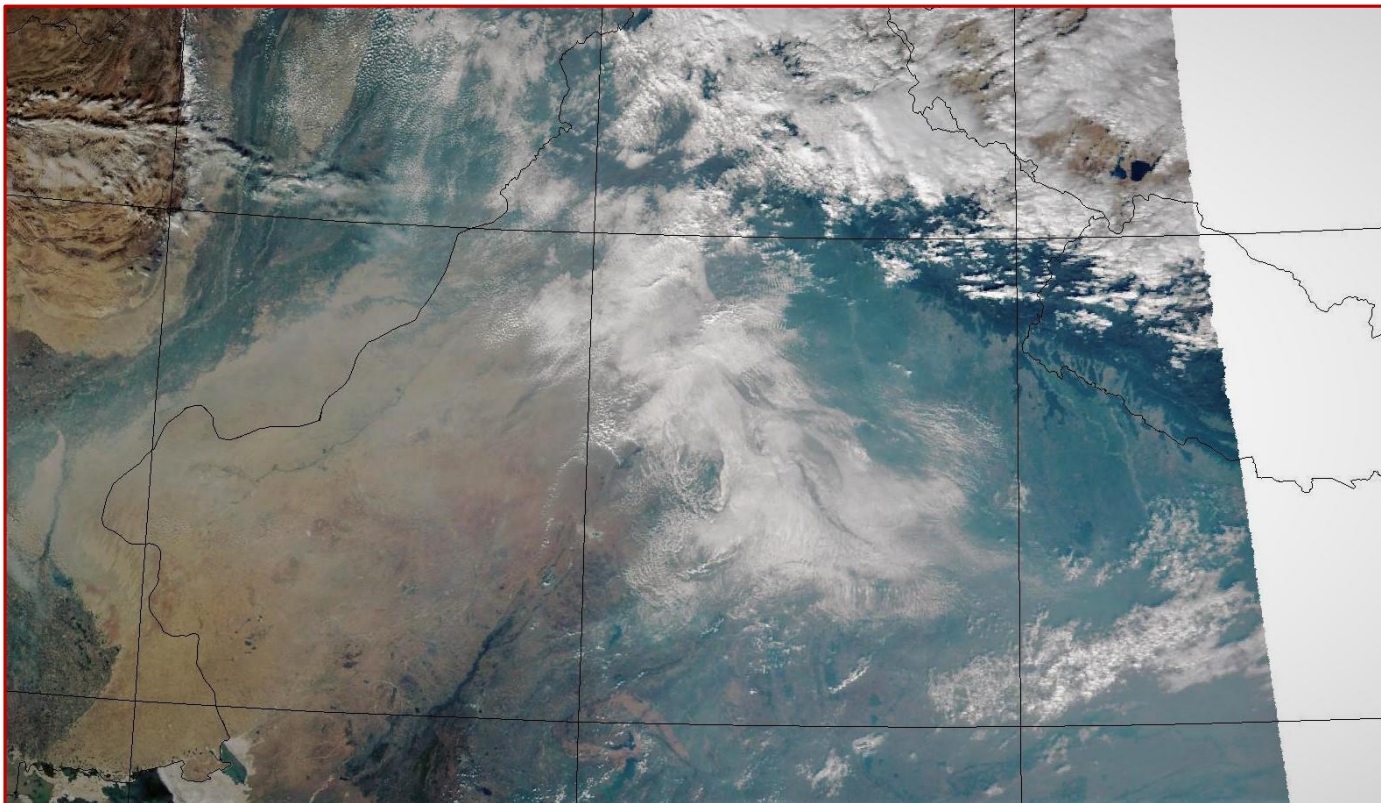
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

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

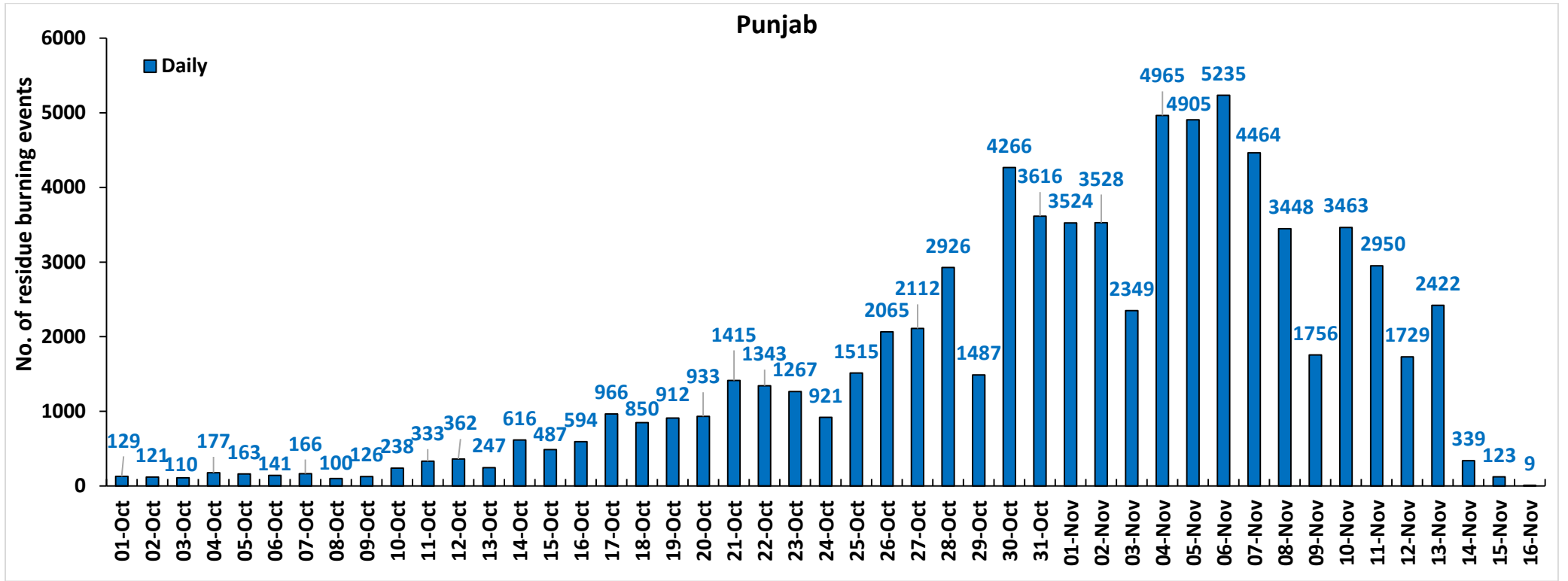
Highlights for 16-November-2020

- Satellites detected **22** residue burning events in the three study States on **16-Nov-2020**.
- The state wise events detected on **16-Nov-2020** were **09** in Punjab, **0** in Haryana and **13** in UP.
- The states of Punjab and Haryana were mostly covered with clouds which prevented fire event detection by satellites.
- The number of events has decreased from **390** on **15-Nov-2020** to **22** on **16-Nov-2020** in the three states.
- Fazilka in Punjab and Jhansi in UP reported the highest number of events on **16-Nov-2020**.
- Total **83778** burning events were detected in the three States between **01-Oct-2020** and **16-Nov-2020**, which are distributed as **75913**, **5000** and **2865** in Punjab, Haryana and UP, respectively.
- In Haryana and UP, the cumulative number of burning events between **01-Oct** and **16-Nov 2020** were lower than in **2019**, while in Punjab the cumulative number of events were more than in **2019**.

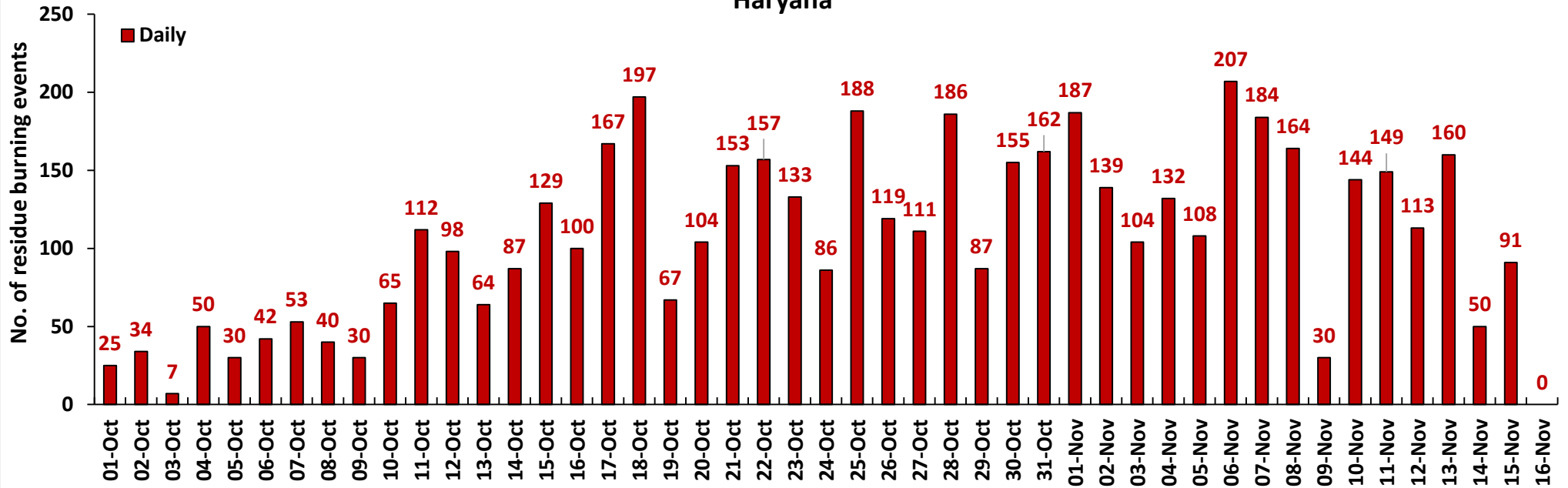
SNPP (VIIRS) Satellite image of North India Acquired on 16-Nov-2020 at 14:06 IST by IARI Ground Station



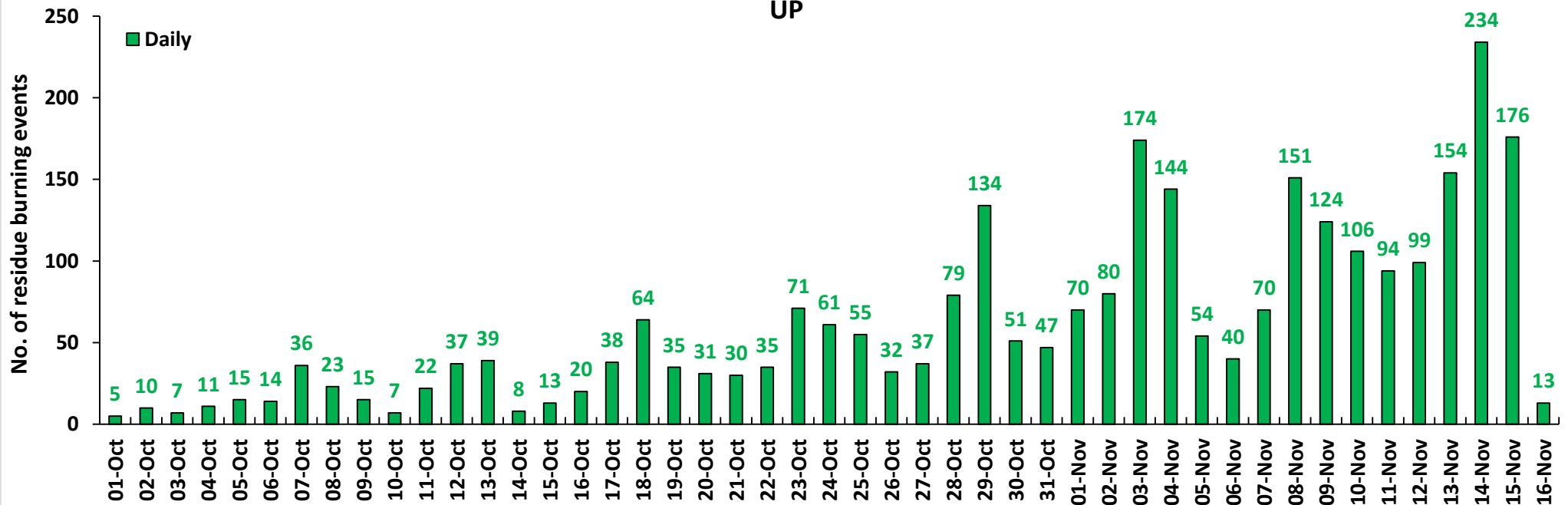
Temporal distribution of residue burning events for the three study States in 2020.



Haryana



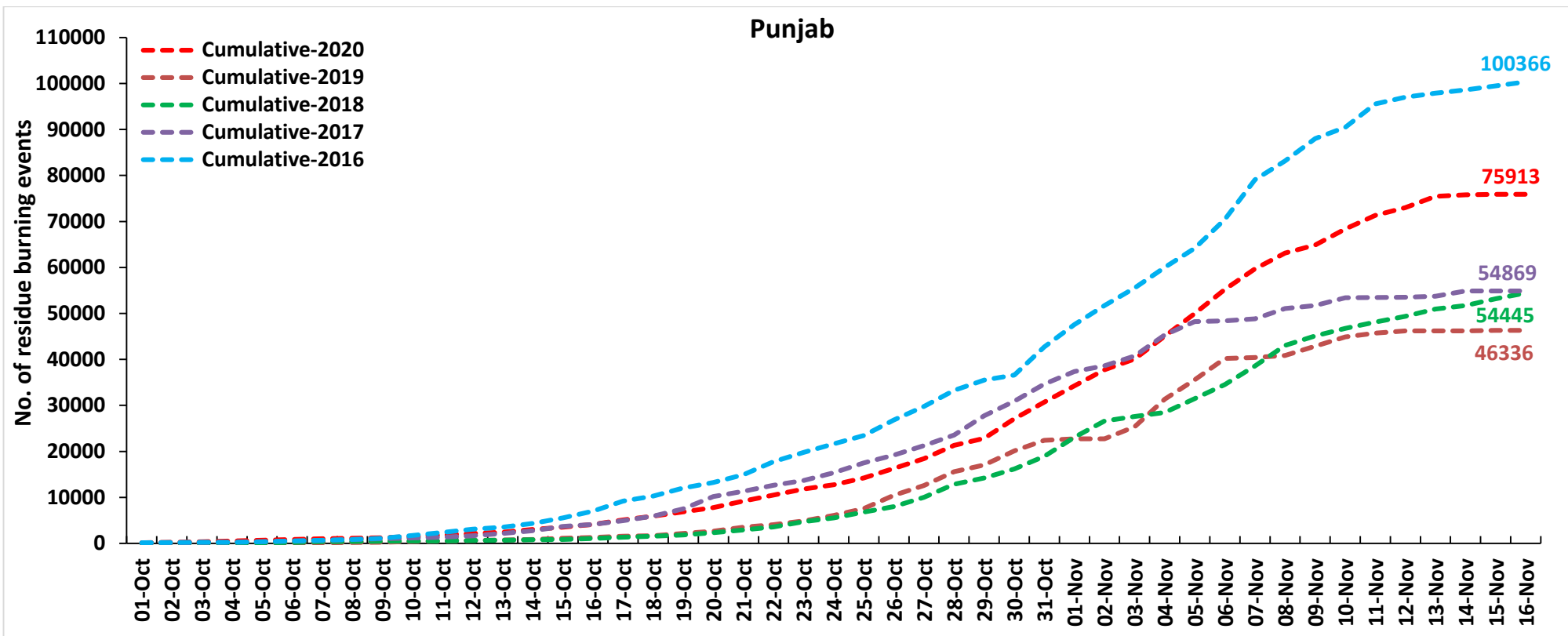
UP

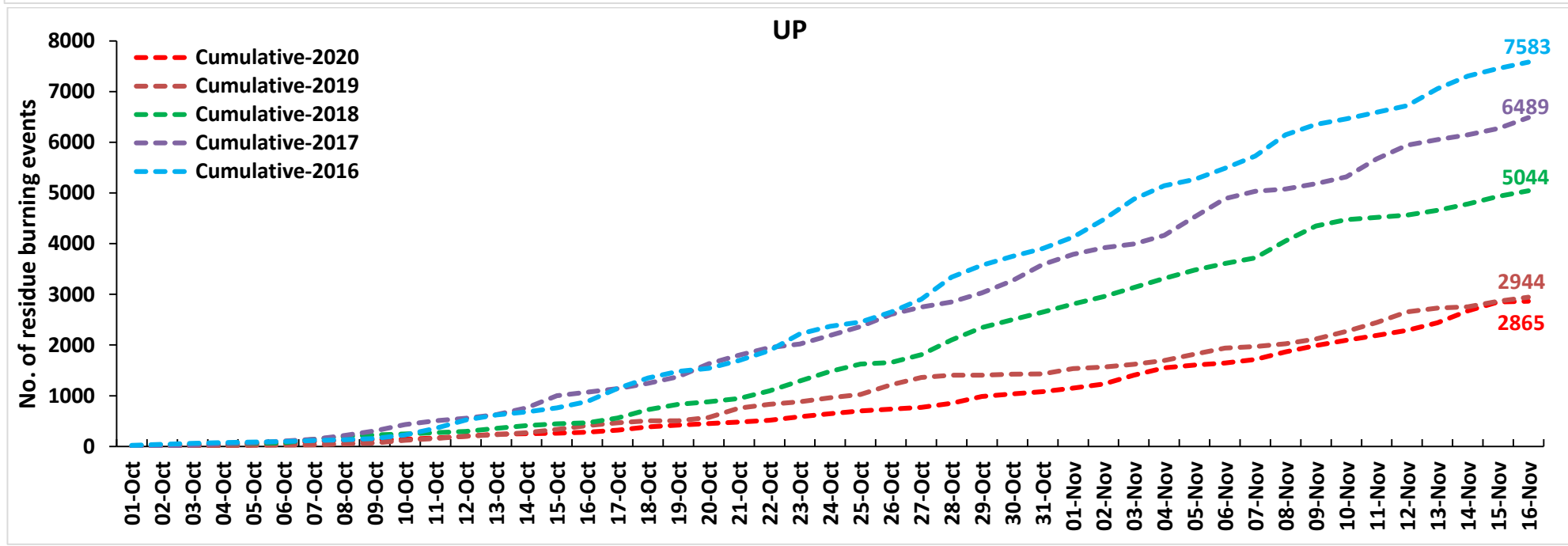
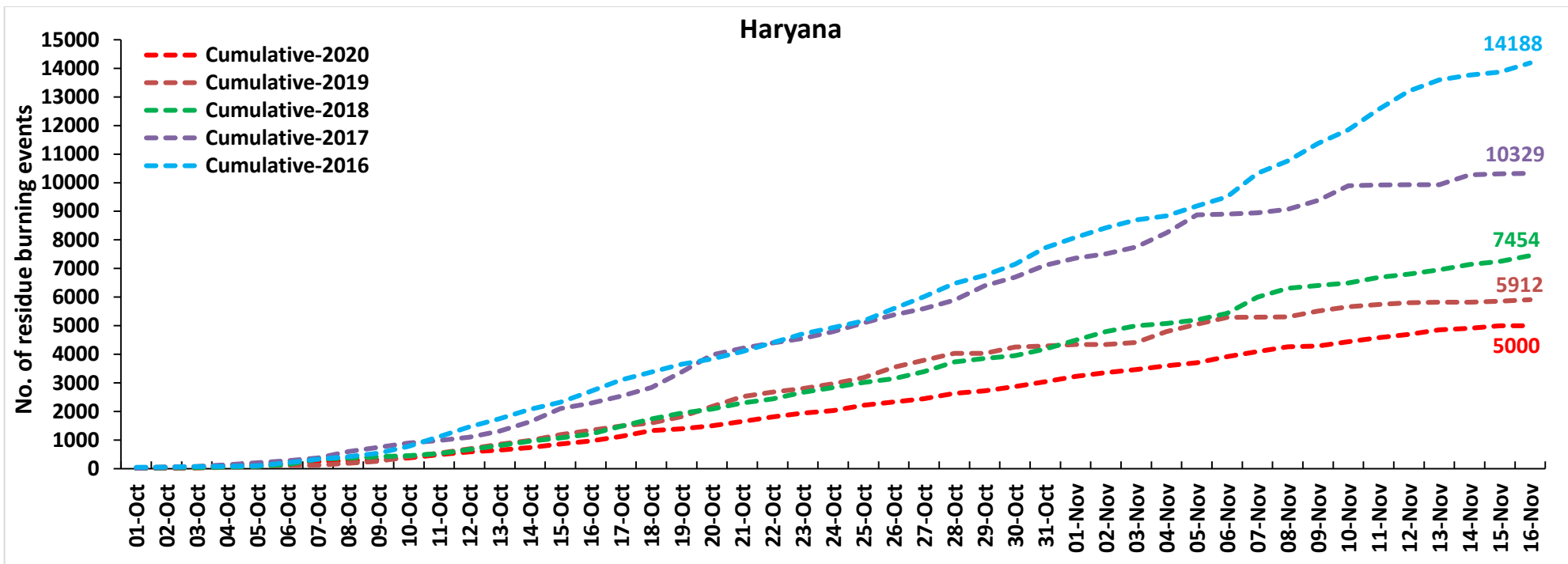


Comparison of residue burning events in current year (2020) with previous years (2019, 2018, 2017 & 2016) for the three study States

(01-Oct to 16-Nov)

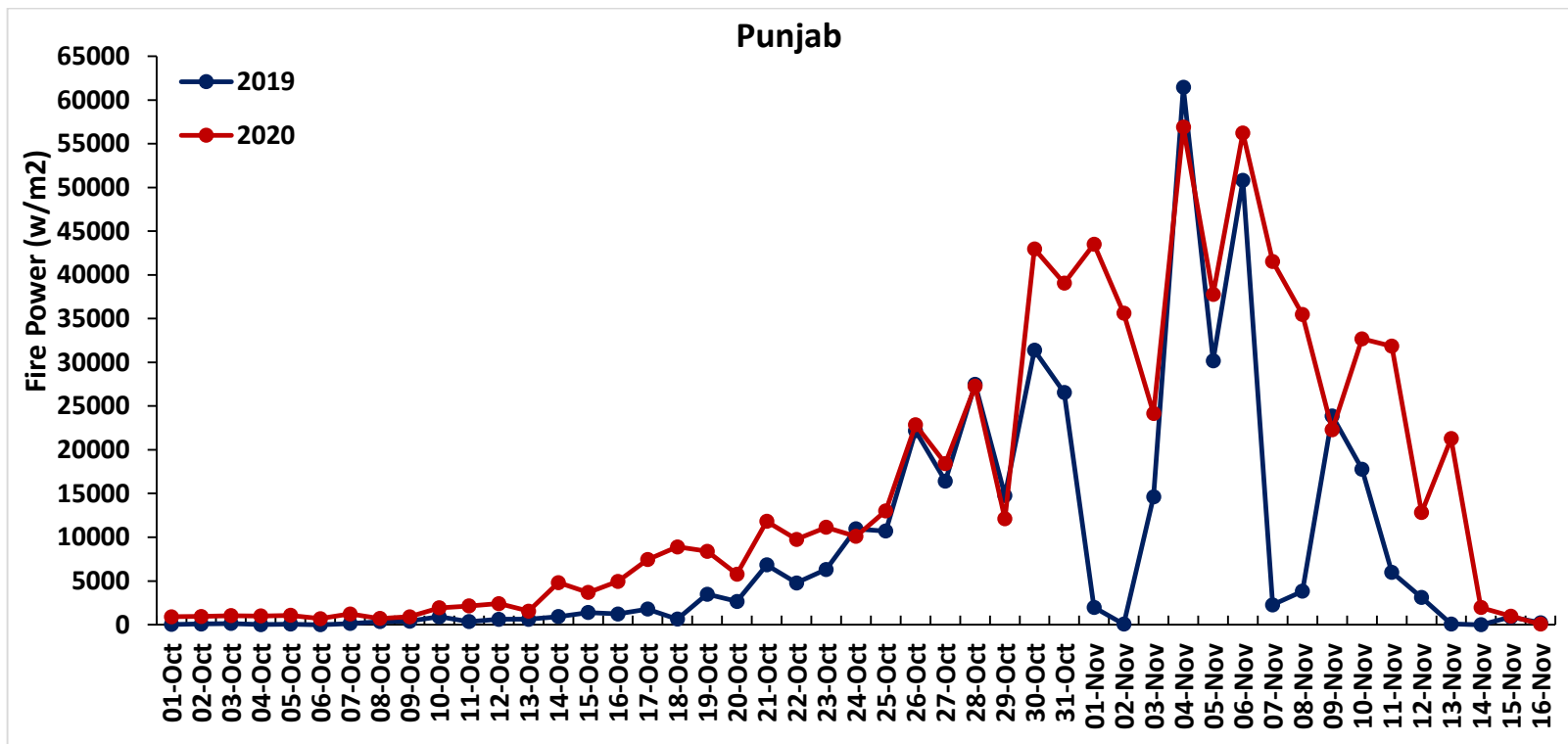
Punjab

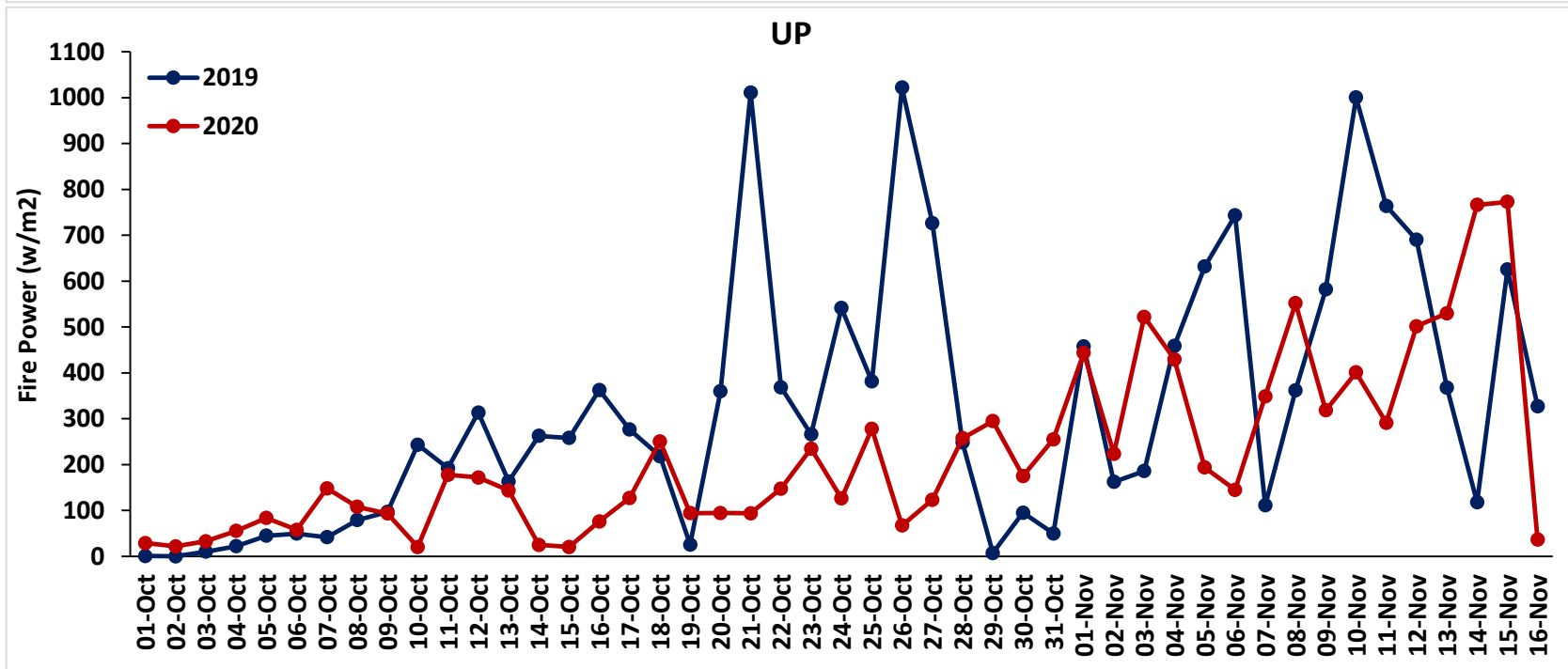
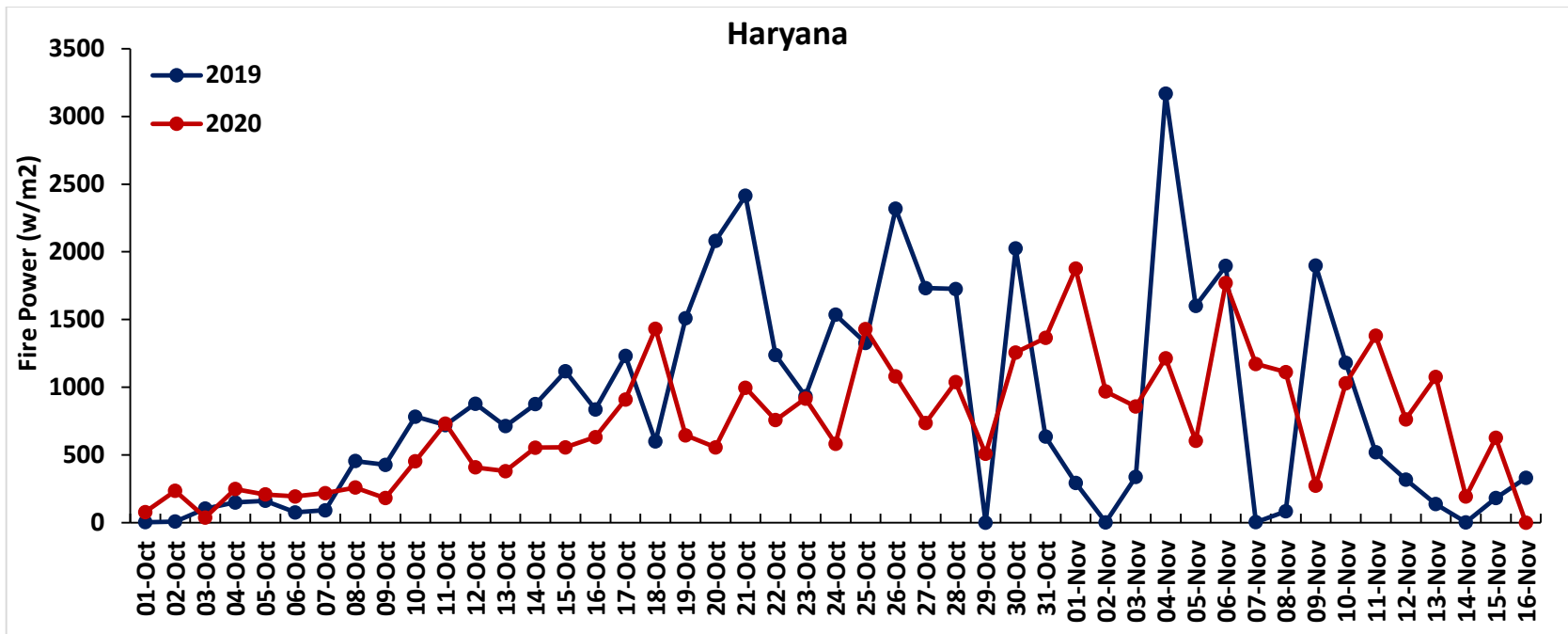




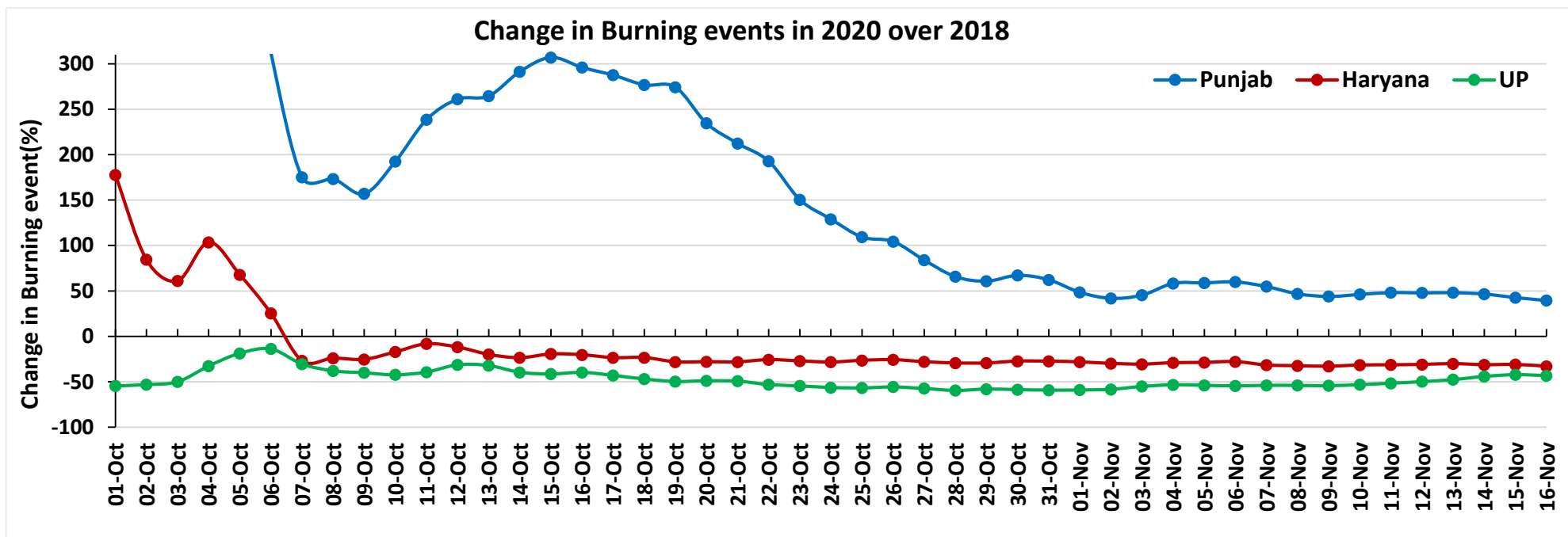
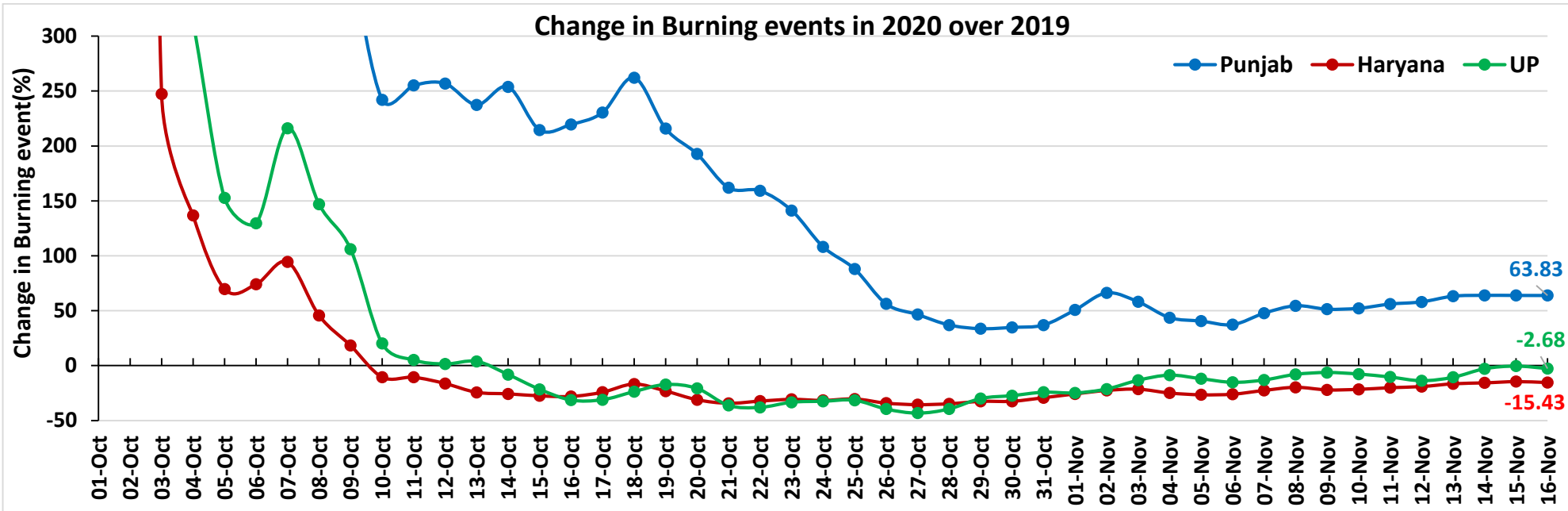
Comparison of Fire Intensity of residue burning events in current year (2020) with previous year (2019)
For the three study States

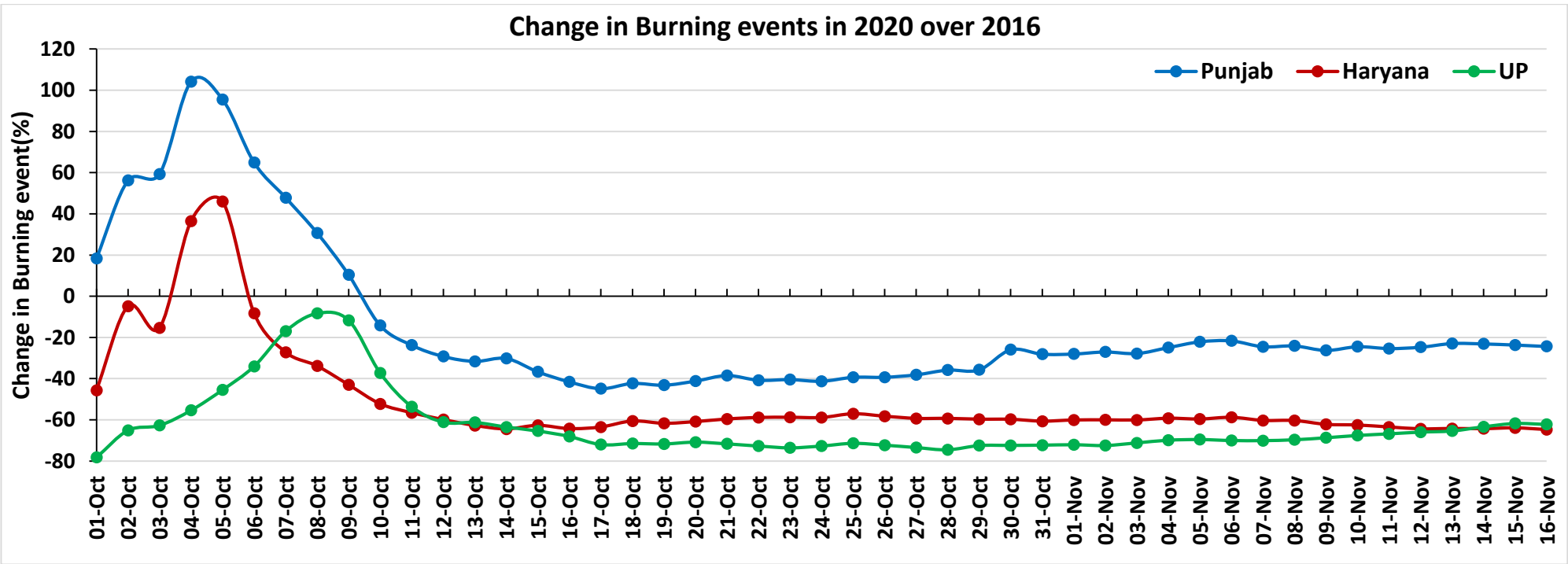
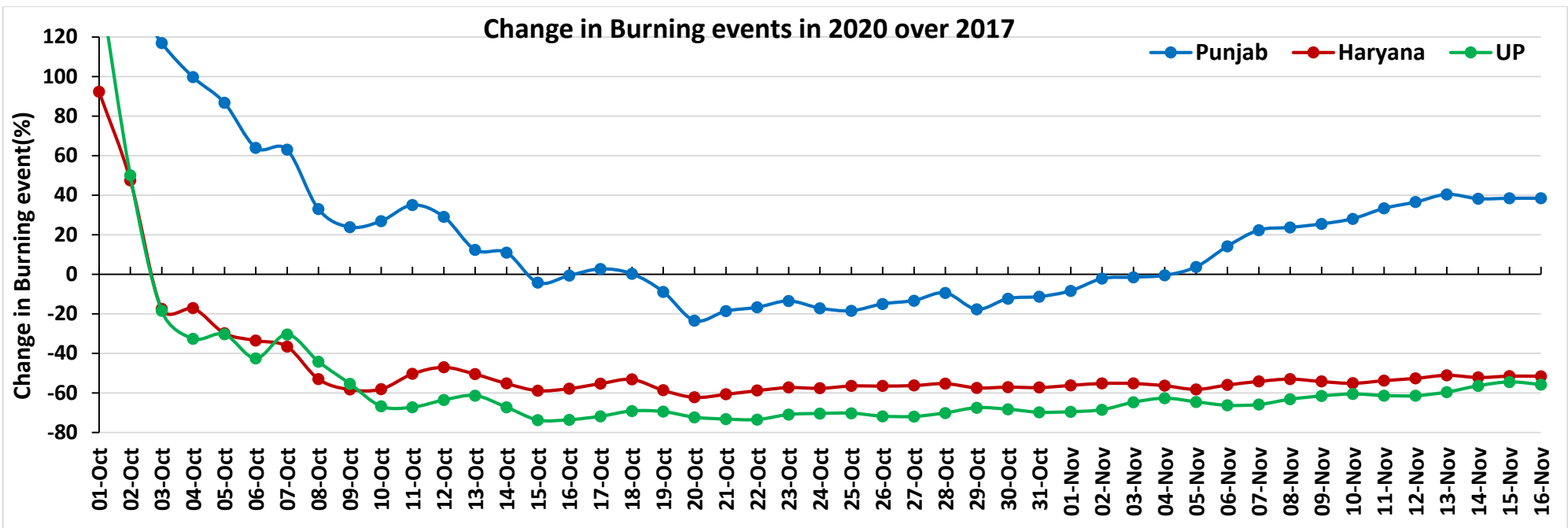
(01-Oct to 16-Nov)





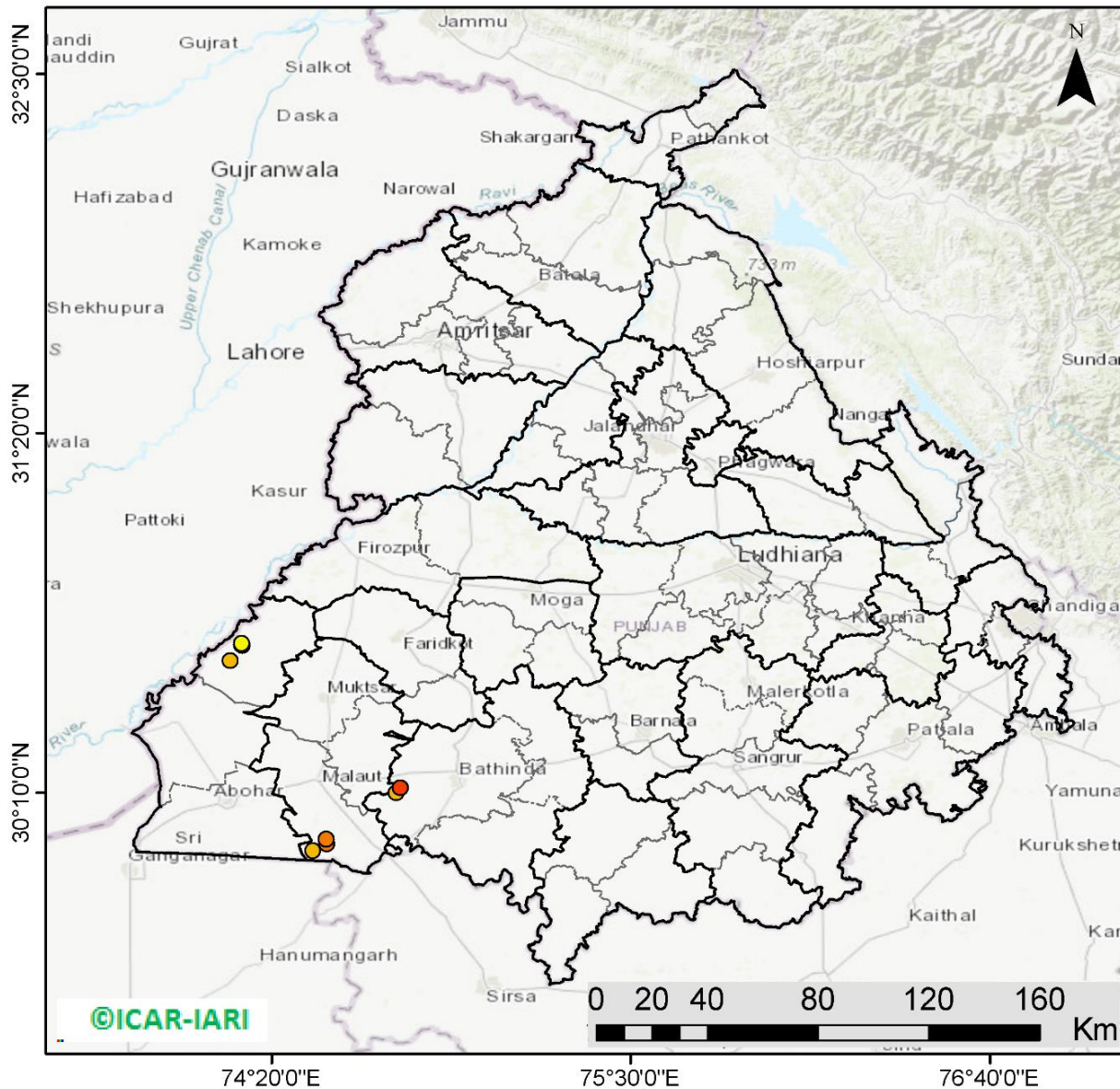
Percent Change in Burning events in 2020 over 2019, 2018, 2017 and 2016 (Daily Cumulative)





(a) Punjab

RICE RESIDUE BURNING IN PUNJAB



09 burning events detected in Punjab on 16th November 2020

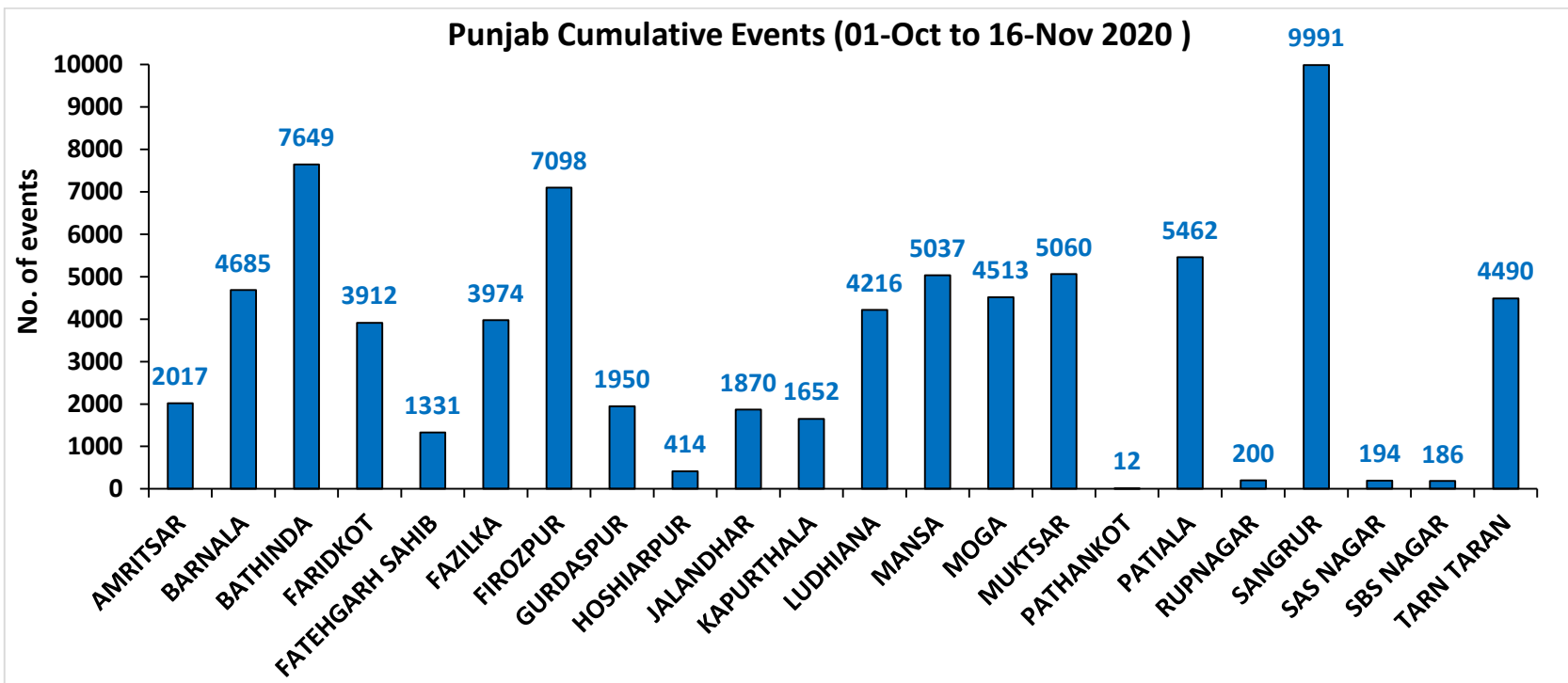
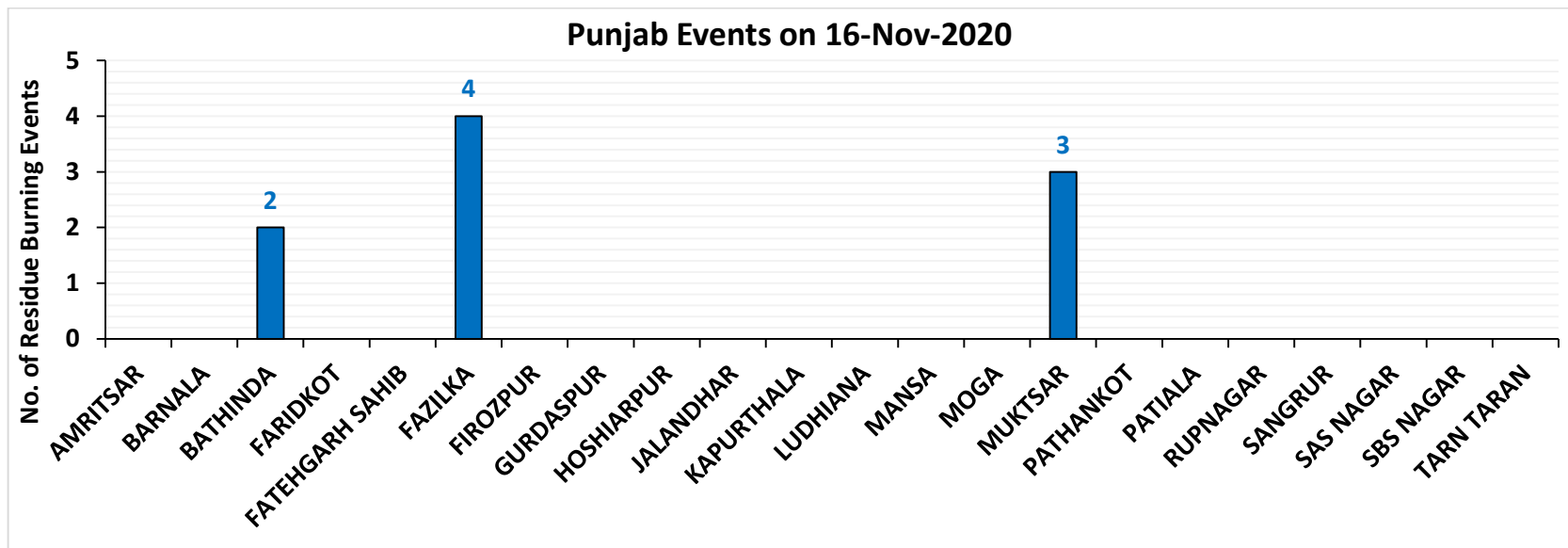
Fire Intensity (W/m²)

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



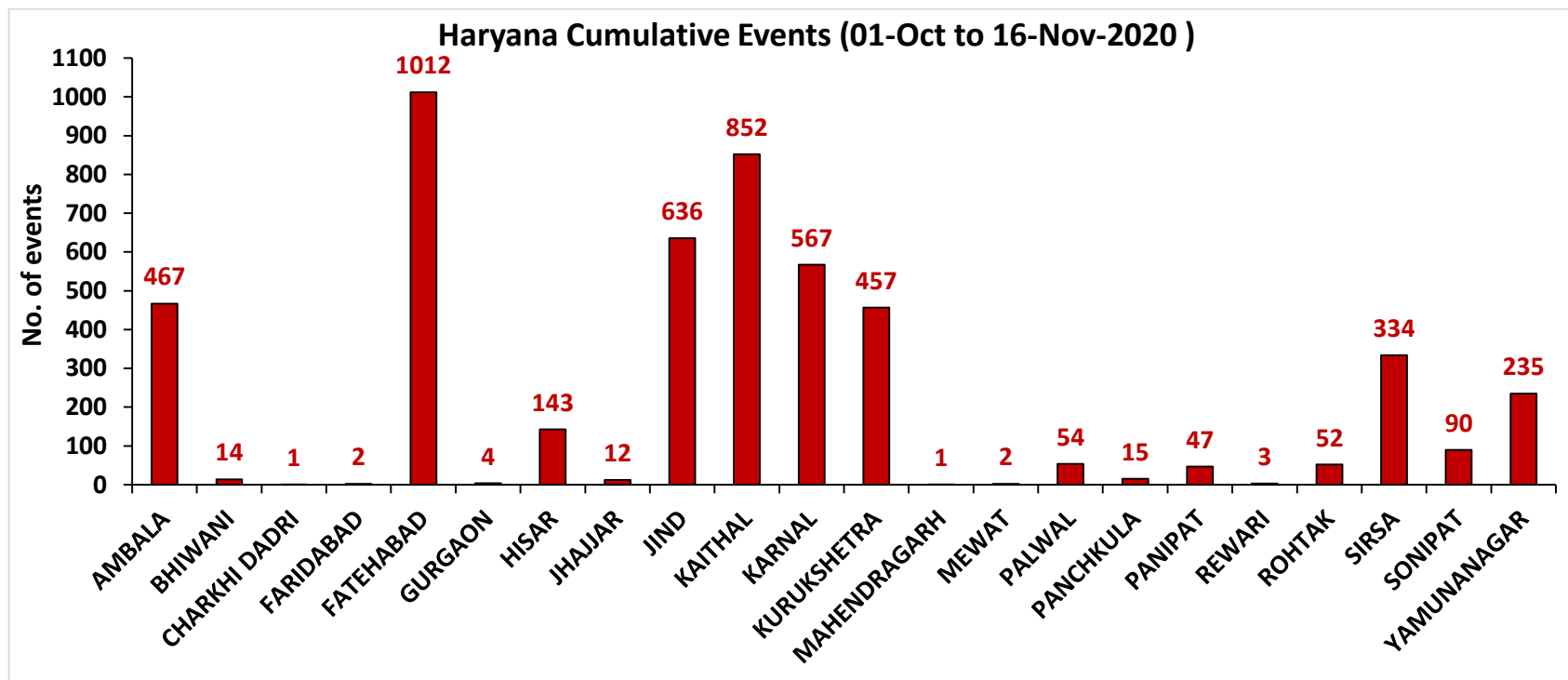
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise number of residue burning events in Punjab (01-Oct to 16-Nov 2020)



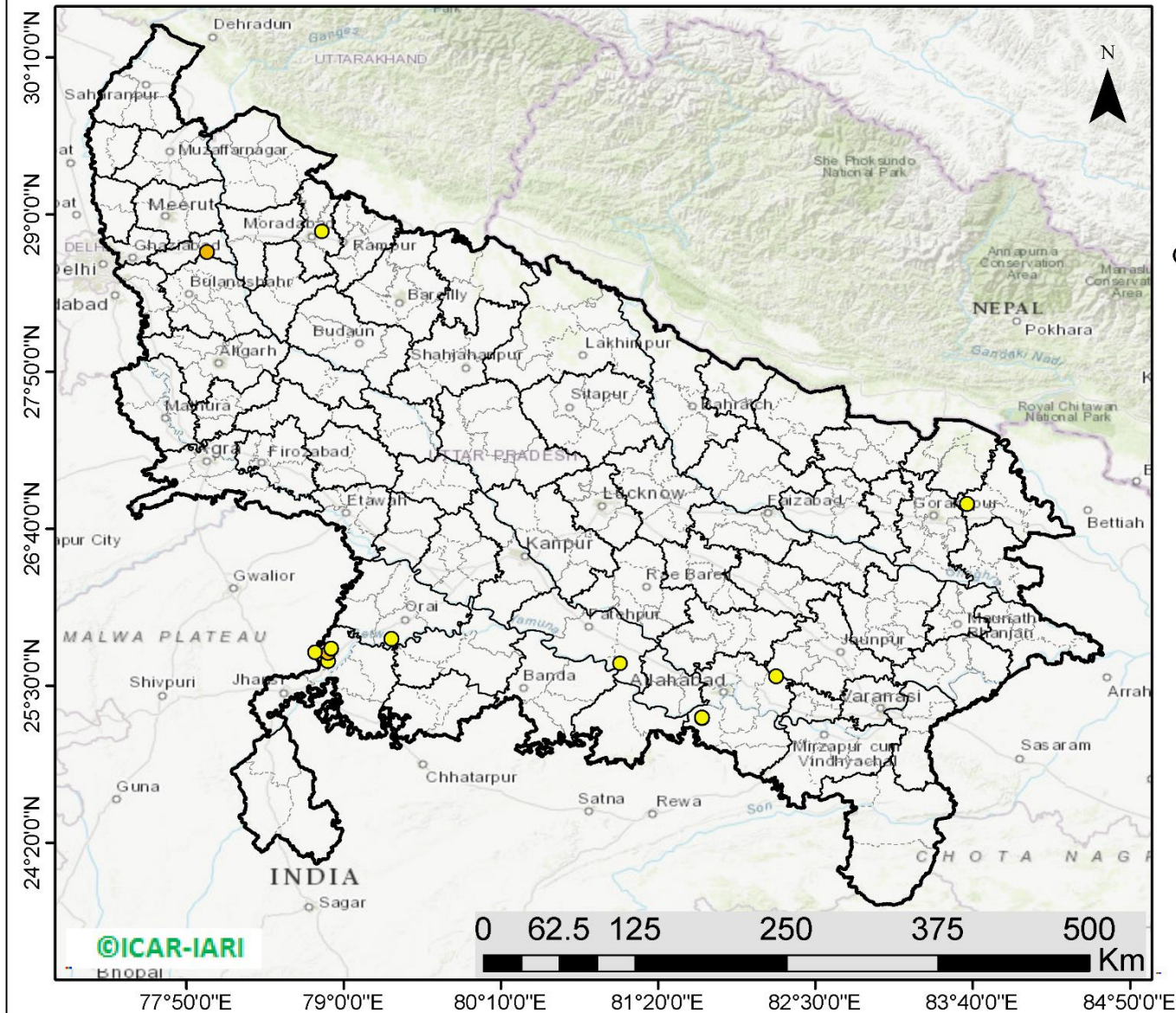
District-wise number of residue burning events in Haryana (01-Oct to 16-Nov 2020)

No daily events were recorded in Haryana on 16-Nov-2020



(c) Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



13 burning events detected in Uttar Pradesh on 16th November 2020

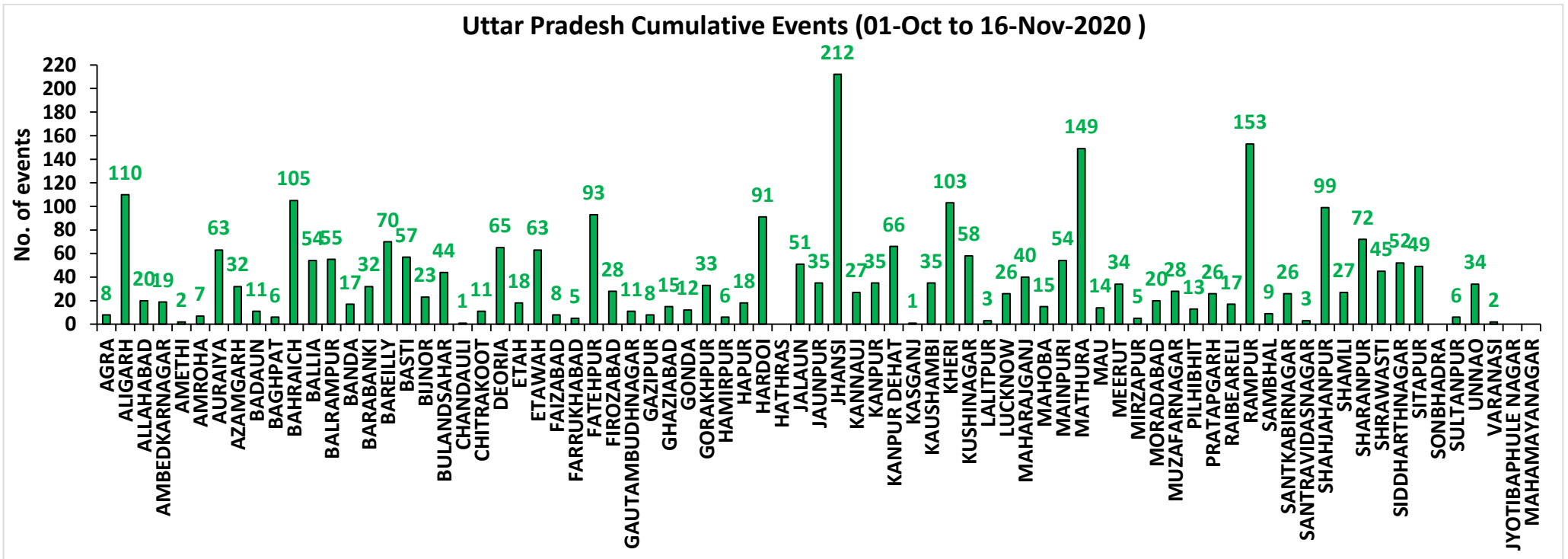
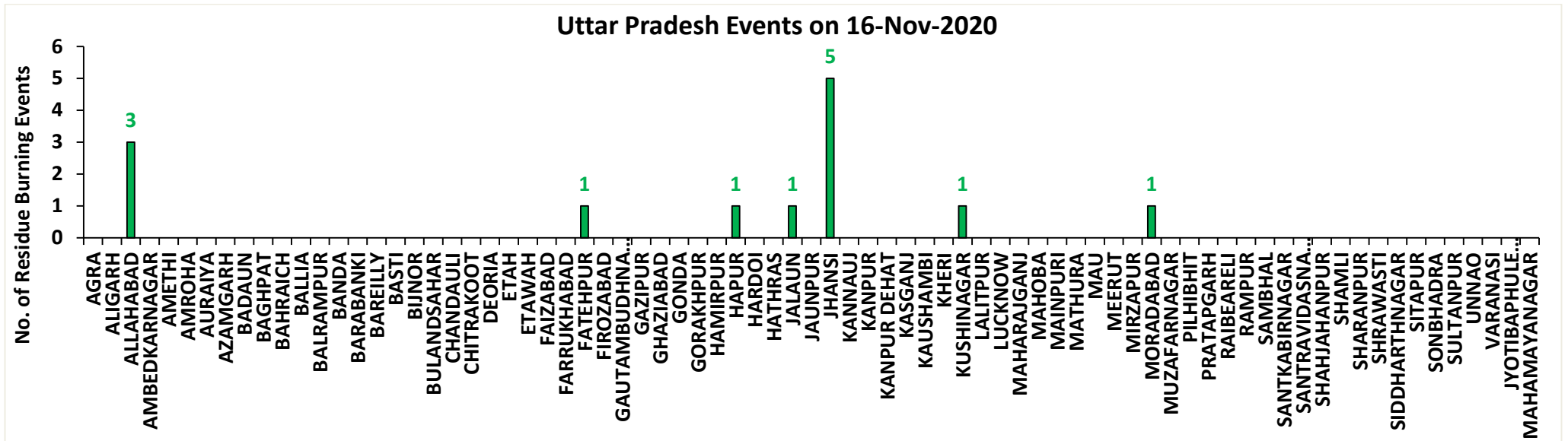
Fire Intensity (W/m²)

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



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

District-wise number of residue burning events in Uttar Pradesh (01-Oct to 16-Nov 2020)



State-wise and date-wise number of residue burning events detected in 2016, 2017, 2018, 2019 and 2020
(Period: 01-October to 16-November)

Date	Punjab					Haryana					UP					Total				
	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
01-Oct	129	3	16	54	109	25	1	9	13	46	5	1	11	2	23	159	5	36	69	178
02-Oct	121	20	9	50	51	34	2	23	27	16	10	0	21	8	20	165	22	53	85	87
03-Oct	110	37	4	62	66	07	16	9	40	16	07	3	12	17	16	124	56	25	119	98
04-Oct	177	3	32	103	37	50	30	16	60	7	11	4	5	22	15	238	37	53	185	59
05-Oct	163	16	56	106	95	30	37	30	68	15	15	11	10	20	14	208	64	96	194	124
06-Oct	141	0	87	138	152	42	22	63	75	105	14	8	13	39	6	197	30	163	252	263
07-Oct	166	27	162	105	171	53	16	180	97	126	36	4	69	33	24	255	47	411	235	321
08-Oct	100	59	39	215	166	40	69	40	218	94	23	18	54	76	14	163	146	133	509	274
09-Oct	126	93	75	163	270	30	70	47	148	121	15	17	32	88	22	171	180	154	399	413
10-Oct	238	172	23	164	597	65	157	37	151	242	07	53	21	126	74	310	382	81	441	913
11-Oct	333	78	30	177	652	112	126	78	87	336	22	38	24	74	128	467	242	132	338	1116
12-Oct	362	99	67	342	694	98	154	133	123	338	37	42	22	51	164	497	295	222	516	1196
13-Oct	247	108	62	470	467	64	159	147	207	284	39	33	61	69	102	350	300	270	746	853
14-Oct	616	141	112	582	812	87	133	153	333	328	08	39	57	137	60	711	313	322	1052	1200
15-Oct	487	262	90	943	1215	129	203	110	458	248	13	63	35	237	76	629	528	235	1638	1539
16-Oct	594	168	174	465	1478	100	148	138	186	385	20	77	20	71	125	714	393	332	722	1988
17-Oct	966	250	272	807	2173	167	152	268	244	399	38	53	94	69	261	1171	455	634	1120	2833
18-Oct	850	100	263	970	1065	197	103	255	306	270	64	39	163	108	204	1111	242	681	1384	1539
19-Oct	912	529	254	1591	1762	67	220	208	541	276	35	3	108	128	132	1014	752	570	2260	2170
20-Oct	933	490	496	2653	1175	104	360	141	597	188	31	62	49	255	62	1068	912	686	3505	1425
21-Oct	1415	852	618	1139	1726	153	339	217	233	257	30	185	66	168	152	1598	1376	901	1540	2135
22-Oct	1343	555	656	1356	2837	157	158	134	186	309	35	78	149	151	194	1535	791	939	1693	3340
23-Oct	1267	827	1113	994	2040	133	131	232	155	313	71	48	193	72	331	1471	1006	1538	1221	2684
24-Oct	921	1220	844	1714	1836	86	165	166	244	221	61	79	192	171	152	1068	1464	1202	2129	2209
25-Oct	1515	1463	1247	2104	1813	188	212	182	303	229	55	67	142	175	83	1758	1742	1571	2582	2125
26-Oct	2065	2861	1173	1715	3390	119	366	132	276	434	32	189	33	240	195	2216	3416	1338	2231	4019
27-Oct	2112	2135	2040	2069	2904	111	249	252	224	417	37	145	154	145	255	2260	2529	2446	2438	3576
28-Oct	2926	3007	2864	2318	3493	186	238	330	292	458	79	45	290	99	435	3191	3290	3484	2709	4386
29-Oct	1487	1504	1321	4184	2258	87	0	124	502	278	134	1	243	180	237	1708	1505	1688	4866	2773
30-Oct	4266	3017	2008	3152	1076	155	222	103	307	395	51	19	158	238	175	4472	3258	2269	3697	1646
31-Oct	3616	2325	2715	3743	6132	162	36	229	413	575	47	4	148	321	153	3825	2365	3092	4477	6860
01-Nov	3524	293	4140	2736	4843	187	50	306	250	362	70	105	161	199	223	3781	448	4607	3185	5428
02-Nov	3528	6	3550	1246	4183	139	2	306	145	332	80	33	142	131	345	3747	41	3998	1522	4860

03-Nov	2349	2646	972	2109	3806	104	68	202	240	375	174	56	181	75	409	2627	2770	1355	2424	4490
04-Nov	4965	6001	882	4603	4477	132	383	77	499	146	144	75	183	168	265	5241	6459	1142	5270	4888
05-Nov	4905	4199	2989	2876	4137	108	253	129	625	345	54	124	163	367	125	5067	4576	3281	3868	4607
06-Nov	5235	4642	3071	171	6303	207	243	222	26	322	40	118	130	357	215	5482	5003	3423	554	6840
07-Nov	4464	189	4033	420	8575	184	2	568	46	821	70	33	108	149	244	4718	224	4709	615	9640
08-Nov	3448	462	4450	2256	4129	164	16	313	128	432	151	54	338	43	419	3763	532	5101	2427	4980
09-Nov	1756	2003	2083	675	4857	30	199	96	311	608	124	96	294	107	205	1910	2298	2473	1093	5670
10-Nov	3463	2046	1675	1642	2468	144	151	85	509	484	106	147	125	131	109	3713	2344	1885	2282	3061
11-Nov	2950	783	1364	103	5040	149	78	196	29	716	94	174	45	358	129	3193	1035	1605	490	5885
12-Nov	1729	520	1256	33	1477	113	68	122	3	634	99	210	45	269	129	1941	798	1423	305	2240
13-Nov	2422	10	1563	237	885	160	16	146	7	389	154	79	94	109	338	2736	105	1803	353	1612
14-Nov	339	0	765	1101	692	50	1	189	340	171	234	22	128	95	247	623	23	1082	1536	1110
15-Nov	123	92	1480	5	871	91	29	107	40	107	176	111	146	123	154	390	232	1733	168	1132
16-Nov	9	23	1250	8	911	0	59	204	17	318	13	79	112	218	123	22	161	1566	243	1352
Total	75913	46336	54445	54869	100366	5000	5912	7454	10329	14188	2865	2944	5044	6489	7583	83778	55192	66943	71687	122137

District-wise and date-wise cumulative number of residue burning events detected in 2016, 2017, 2018, 2019 and 2020
(Period: 01-Oct to 16-Nov)

(a) Punjab

Districts	01-Oct to 16-Nov				
	2016	2017	2018	2019	2020
AMRITSAR	2090	1205	1151	1300	2017
BARNALA	5662	2790	2997	2867	4685
BATHINDA	8743	4750	5889	5009	7649
FARIDKOT	4583	2862	2813	2021	3912
FATEHGARH SAHIB	2451	1607	832	799	1331
FAZILKA	0	0	0	1483	3974
FIROZPUR	13017	5611	8703	4351	7098
GURDASPUR	2152	1507	1092	1440	1950
HOSHIARPUR	895	477	187	307	414
JALANDHAR	4625	1987	1307	1480	1870
KAPURTHALA	3121	1526	718	1344	1652
LUDHIANA	9336	3978	2454	2195	4216
MANSA	5524	4082	4065	3416	5037
MOGA	6372	1986	2486	2046	4513
MUKTSAR	6700	3433	5003	2603	5060
PATHANKOT	0	0	0	6	12
PATIALA	6530	5006	4156	3793	5462
RUPNAGAR	709	326	76	114	200
SANGRUR	11820	8222	7609	6268	9991
SAS NAGAR	114	107	104	150	194
SBS NAGAR	1591	792	343	258	186
TARN TARAN	4331	2615	2460	3086	4490
Total	100366	54869	54445	46336	75913

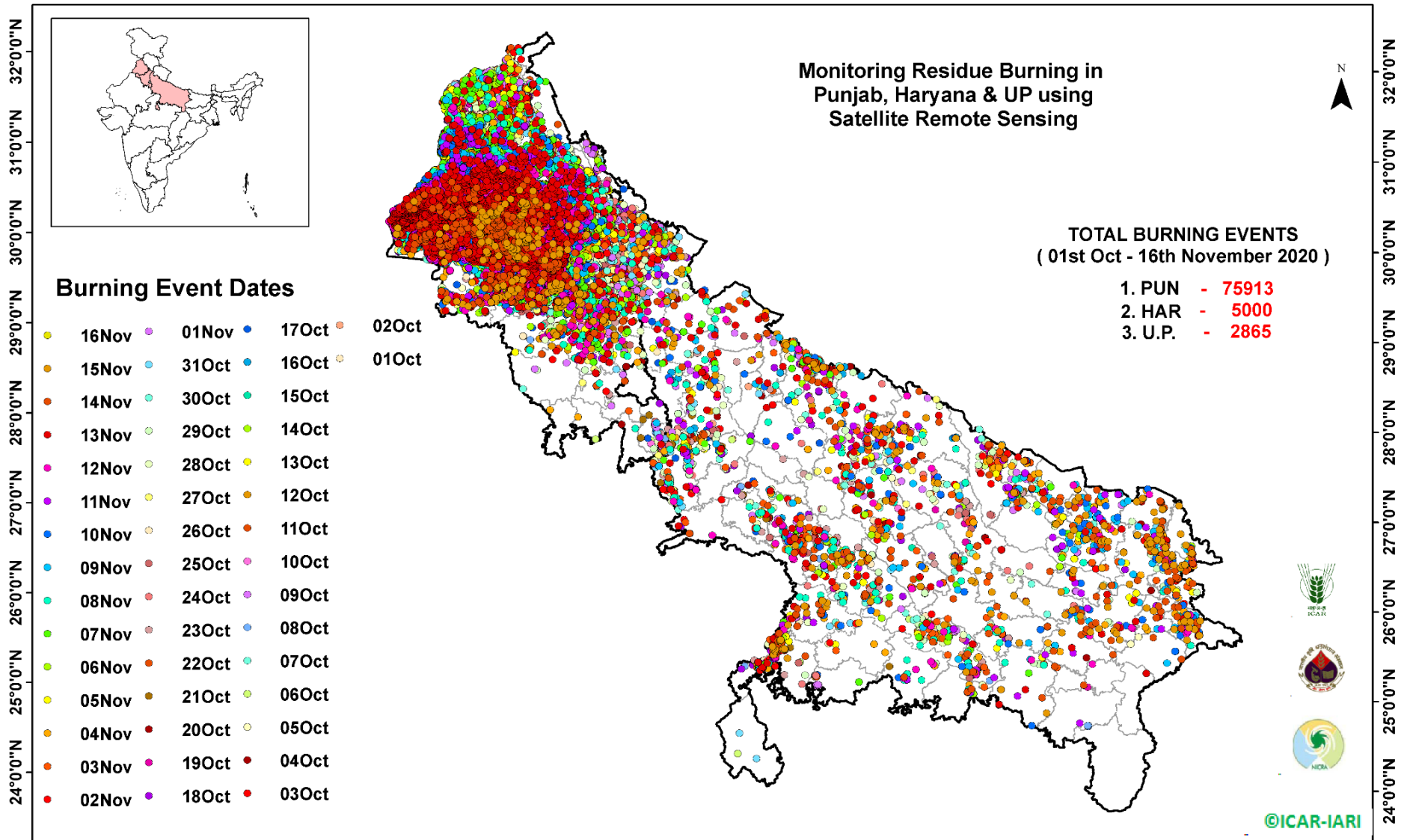
(b) Haryana

Districts	01-Oct to 16-Nov				
	2016	2017	2018	2019	2020
AMBALA	529	490	323	335	467
BHIWANI	62	27	13	10	14
CHARKHI DADRI	0	0	0	0	1
FARIDABAD	283	341	184	10	2
FATEHABAD	4530	2955	1976	1040	1012
GURGAON	0	0	0	4	4
HISAR	338	160	132	100	143
JHAJJAR	24	13	14	3	12
JIND	818	898	734	525	636
KAITHAL	1738	1491	1260	1226	852
KARNAL	1623	1484	833	1064	567
KURUKSHETRA	1075	1141	679	736	457
MAHENDRAGARH	0	0	0	2	1
MEWAT	0	0	0	3	2
PALWAL	0	0	0	188	54
PANCHKULA	0	0	3	21	15
PANIPAT	76	74	51	28	47
REWARI	0	0	0	3	3
ROHTAK	74	53	13	14	52
SIRSA	2710	840	1033	325	334
SONIPAT	69	55	28	26	90
YAMUNANAGAR	239	307	178	249	235
Total	14188	10329	7454	5912	5000

(C)
Uttar Pradesh

Districts	01-Oct to 16-Nov																
	2016	2017	2018	2019	2020	GAUTAMBUDHNAGAR	20	34	11	16	11	MUZAFARNAGAR	104	109	31	24	28
AGRA	0	0	0	4	8	GAZIPUR	13	7	8	8	8	PILHIBHIT	908	702	412	325	13
ALIGARH	48	75	89	88	110	GHAZIABAD	60	39	24	12	15	PRATAPGARH	25	32	22	10	26
ALLAHABAD	3	8	11	6	20	GONDA	43	33	18	6	12	RAIBEARELI	50	44	29	11	17
AMBEDKARNAGAR	59	25	11	4	19	GORAKHPUR	47	60	65	10	33	RAMPUR	611	610	219	300	153
AMETHI	0	0	0	5	2	HAMIRPUR	0	0	1	23	6	SAMBHAL	0	0	0	7	9
AMROHA	0	0	0	7	7	HAPUR	0	0	0	8	18	SANTKABIRNAGAR	49	57	47	4	26
AURAIYA	181	152	48	18	63	HARDOI	227	185	107	58	91	SANTRAVIDASNAGAR	0	0	0	0	3
AZAMGARH	26	19	20	2	32	HATHRAS	0	0	0	1	0	SHAHJAHANPUR	1119	673	360	320	99
BADAUN	6	6	9	22	11	JALAUN	0	0	0	91	51	SHAMLI	0	0	0	21	27
BAGHPAT	0	0	0	6	6	JAUNPUR	11	6	14	1	35	SHARANPUR	79	104	48	61	72
BAHRAICH	58	37	57	36	105	JHANSI	0	0	2	88	212	SHRAWASTI	31	29	35	16	45
BALLIA	10	16	10	6	54	KANNAUJ	21	14	6	8	27	SIDDHARTHANAGAR	212	152	426	18	52
BALRAMPUR	28	26	38	4	55	KANPUR	9	7	8	5	35	SITAPUR	105	62	33	31	49
BANDA	1	11	8	8	17	KANPUR DEHAT	28	40	17	21	66	SONBHADRA	14	9	9	0	0
BARABANKI	204	147	166	55	32	KASGANJ	0	0	0	2	1	SULTANPUR	40	18	19	6	6
BAREILLY	235	193	114	102	70	KAUSHAMBI	15	35	32	12	35	UNNAO	48	39	33	23	34
BASTI	121	175	98	6	57	KHERI	385	244	172	152	103	VARANASI	1	0	0	0	2
BIJNOR	40	37	6	12	23	KUSHINAGAR	28	47	66	13	58	JYOTIBAPHULE NAGAR	8	11	4	0	0
BULANDSAHAR	16	28	12	23	44	LALITPUR	0	0	0	6	3	MAHAMAYANAGAR	2	2	6	0	0
CHANDAULI	2	1	0	0	1	LUCKNOW	55	30	26	14	26	Total	7583	6489	5044	2944	2865
CHITRAKOOT	0	0	0	3	11	MAHARAJGANJ	374	620	731	152	40						
DEORIA	37	35	42	2	65	MAHOBA	0	0	0	9	15						
ETAH	16	28	24	4	18	MAINPURI	60	81	41	32	54						
ETAWAH	77	88	33	37	63	MATHURA	1429	1082	1046	458	149						
FAIZABAD	10	8	7	3	8	MAU	10	5	9	1	14						
FARRUKHABAD	0	0	0	5	5	MEERUT	56	60	12	21	34						
FATEHPUR	43	35	67	43	93	MIRZAPUR	2	10	5	3	5						
FIROZABAD	23	18	9	13	28	MORADABAD	40	29	11	12	20						

Map of Cumulative Burning Events (01-Oct to 16-Nov 2020)



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

Details of residue burning events in Punjab on 16-Nov-2020

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	BATHINDA	BATHINDA	S-NPP	30.16450	74.73859	14:06:00	D	6.20
2	BATHINDA	BATHINDA	S-NPP	30.18099	74.75083	14:06:00	D	15.80
3	FAZILKA	JALALABAD	S-NPP	30.59412	74.19940	14:06:00	D	5.20
4	FAZILKA	JALALABAD	S-NPP	30.64513	74.23938	14:06:00	D	4.50
5	FAZILKA	JALALABAD	S-NPP	30.64629	74.23637	14:06:00	D	5.10
6	FAZILKA	JALALABAD	S-NPP	30.65098	74.23583	14:06:00	D	2.80
7	MUKTSAR	MALAUT	S-NPP	29.97736	74.46836	14:06:00	D	8.10
8	MUKTSAR	MALAUT	S-NPP	30.00044	74.51225	14:06:00	D	10.80
9	MUKTSAR	MALAUT	S-NPP	30.01465	74.51064	14:06:00	D	11.70

Details of residue burning events in Uttar Pradesh on 16-Nov-2020

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	Time (IST)	Day / Night	Fire Power (W/m ²)
1	ALLAHABAD	BARA	S-NPP	25.26007	81.66023	01:12:00	N	1.10
2	ALLAHABAD	BARA	S-NPP	25.26341	81.65957	01:12:00	N	1.00
3	ALLAHABAD	HADIYA	S-NPP	25.57046	82.20959	01:12:00	N	0.50
4	FATEHPUR	KHAGA	S-NPP	25.66339	81.05215	12:24:00	D	3.70
5	HAPUR	GARHMUKTESAR	TERRA	28.72200	77.98500	11:05:00	D	7.30
6	JALAUN	URAI	S-NPP	25.84634	79.35592	12:24:00	D	1.30
7	JHANSI	MOTH	S-NPP	25.67919	78.88479	14:06:00	D	2.20
8	JHANSI	MOTH	S-NPP	25.73866	78.88459	14:06:00	D	6.20
9	JHANSI	MOTH	S-NPP	25.74730	78.78871	01:12:00	N	0.50
10	JHANSI	MOTH	S-NPP	25.77045	78.91036	14:06:00	D	5.10
11	JHANSI	MOTH	S-NPP	25.77386	78.91043	14:06:00	D	4.60
12	KUSHINAGAR	HATA	S-NPP	26.84859	83.62646	01:12:00	N	0.70
13	MORADABAD	MORADABAD	S-NPP	28.87178	78.83978	14:06:00	D	2.30

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 / 750	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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Softcopy of this report and latest statistics can be seen on <http://creams.iari.res.in>

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)
