



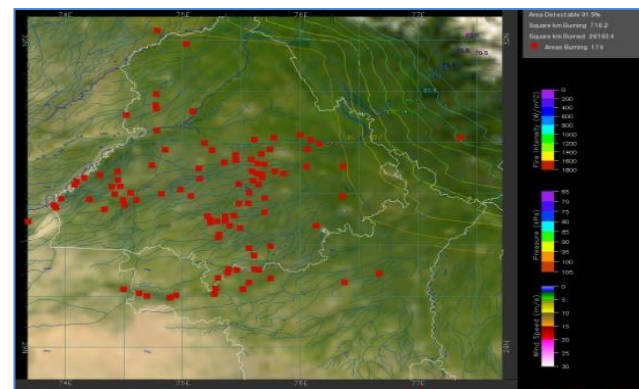
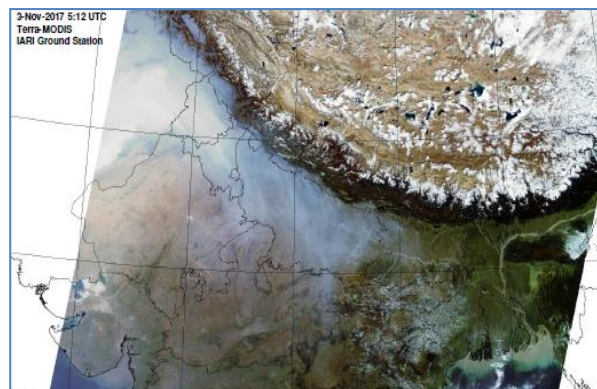
**Bulletin
No. 77**

**Events Date:
30-Nov-2021**

**Issued on:
30-Nov-2021**



MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2021



Prepared by:

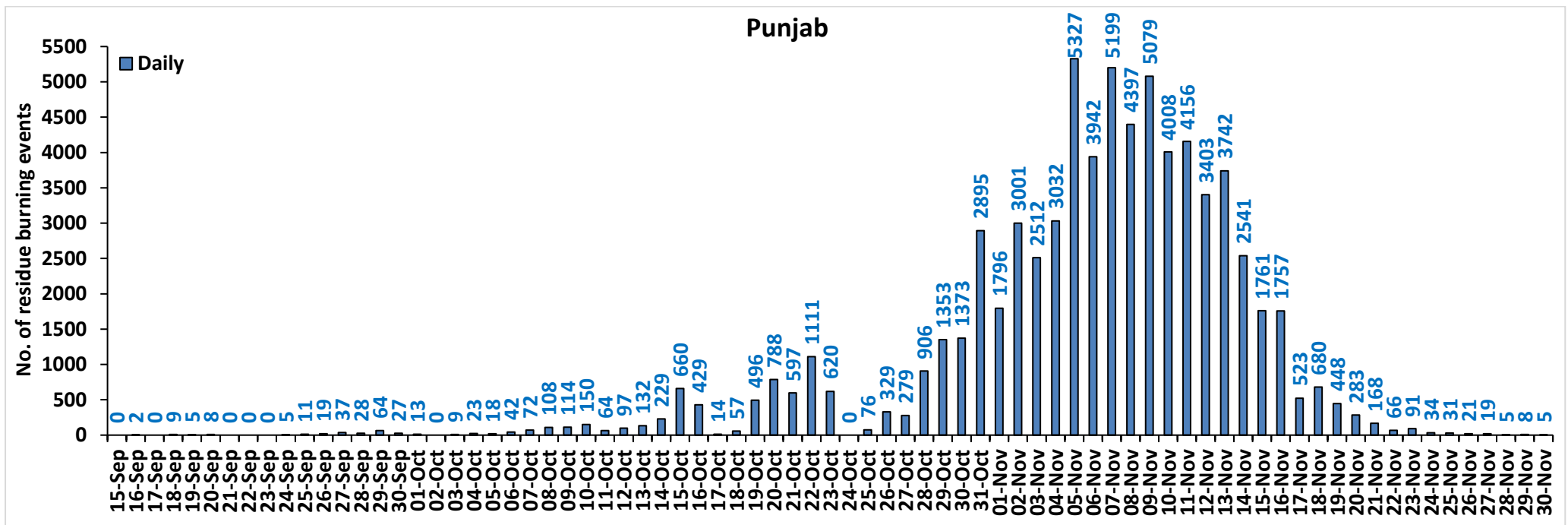
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

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

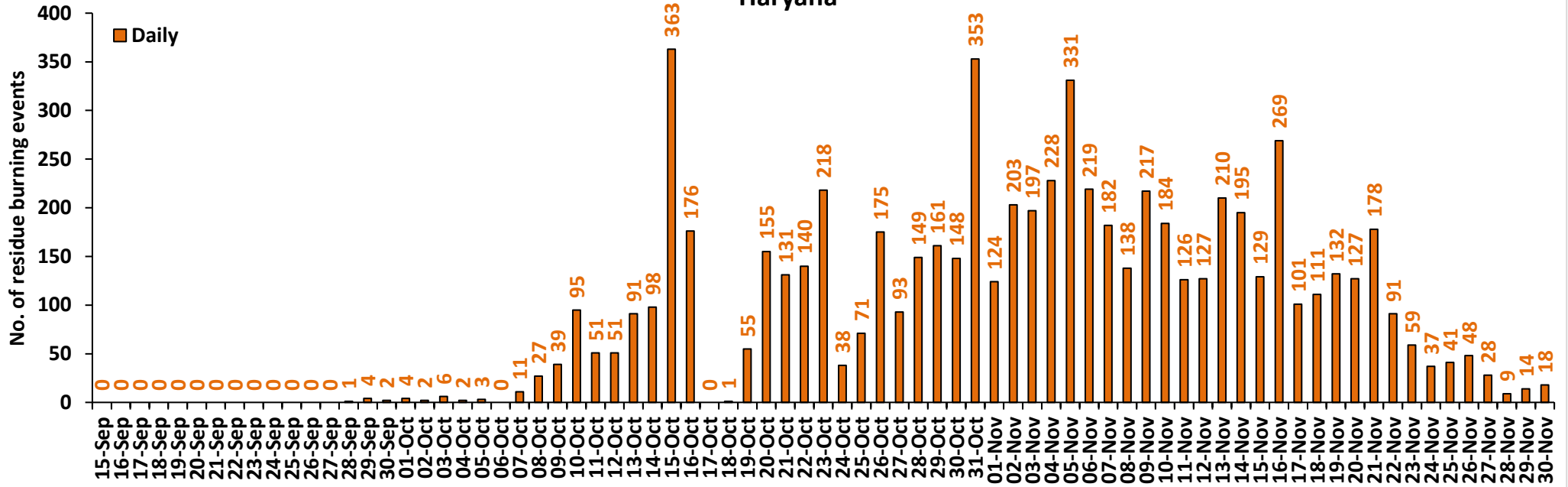
Highlights for 30-November-2021

- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the new "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **72** residue burning events in the six study States on 30-Nov-2021.
- The state wise events detected on 30-Nov-21 were **08** in Punjab, **18** in Haryana, **26** in UP, **00** in Delhi, **09** in Raj and **14** in MP.
- The number of events has decreased from **225** on 29-Nov-2021 to **72** on 30-Nov-2021 in the six study states.
- Total **92047** burning events were detected in the six states between 15-Sept-2021 and 30-Nov-2021, which are distributed as **71304**, **6987**, **4242**, **4**, **1350** and **8160** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.
- Overall, the total burning events recorded in the six states are **14.6%** less than in 2020 till date. Punjab recorded **14.1%** reduction, Haryana recorded **66.3%** increase, UP recorded **8.4%** reduction, Delhi recorded **55.6%** reduction, Rajasthan recorded **23.1%** reduction and MP recorded **42.3%** reduction, in the current season than in 2020.

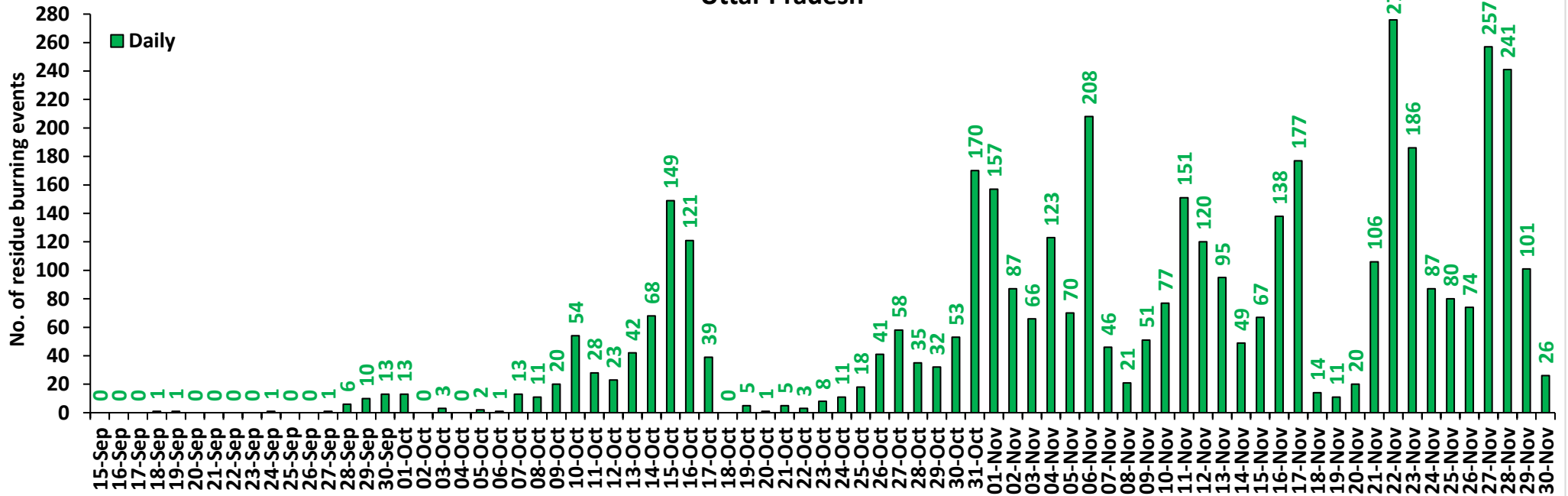
Temporal distribution of rice residue burning events for the study States in 2021



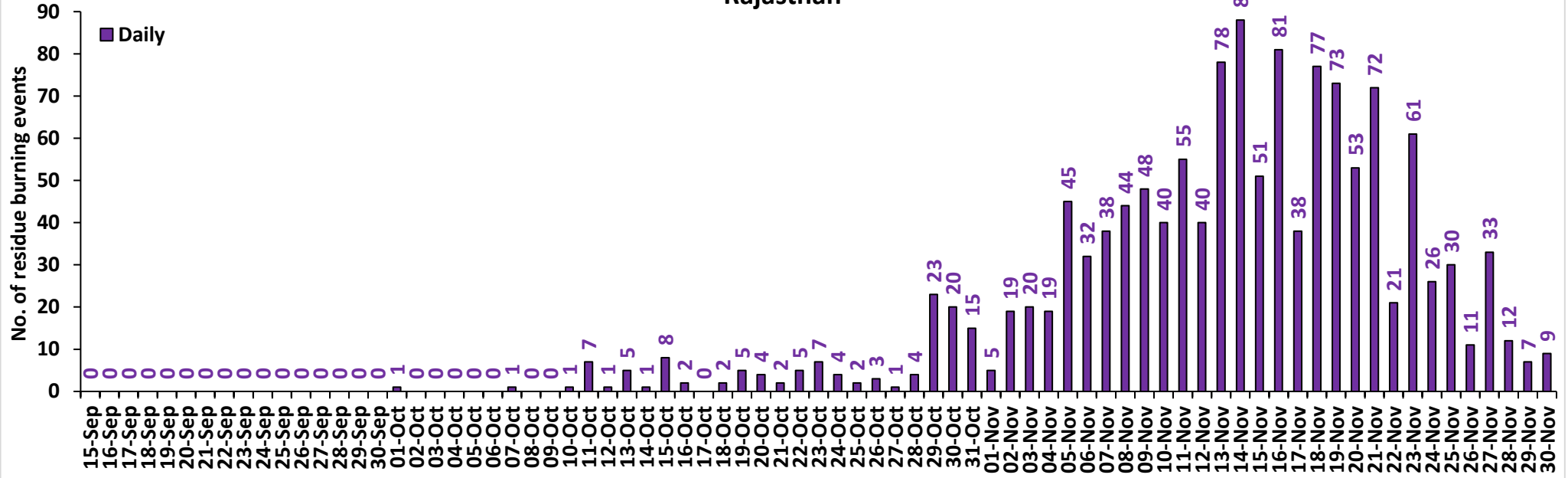
Haryana



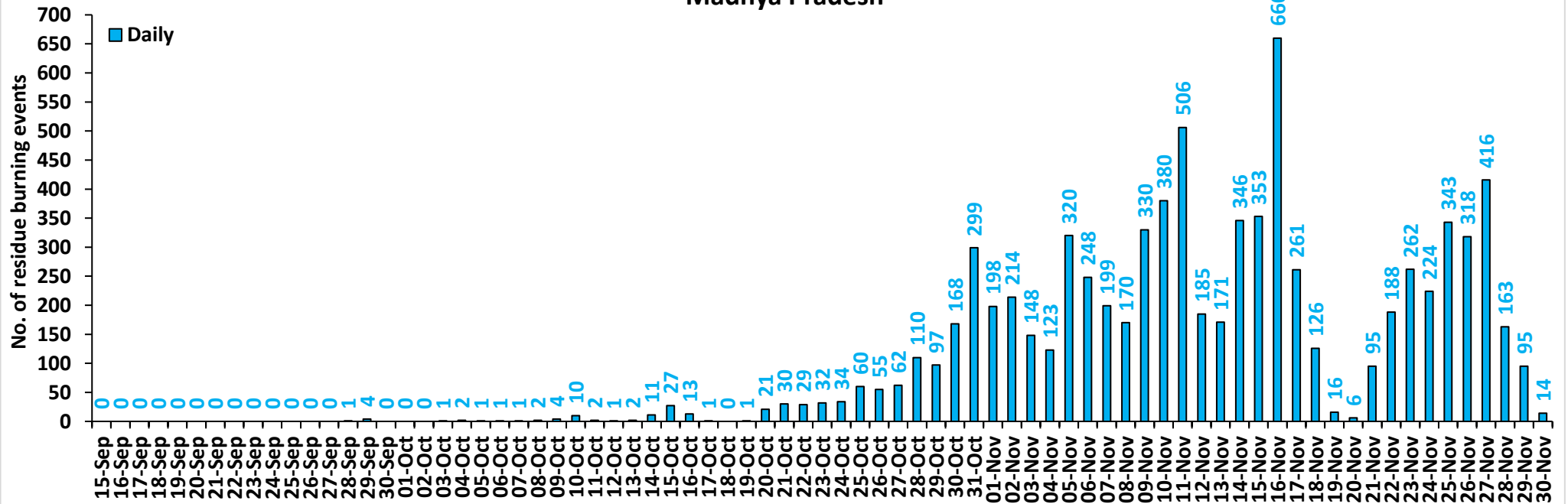
Uttar Pradesh



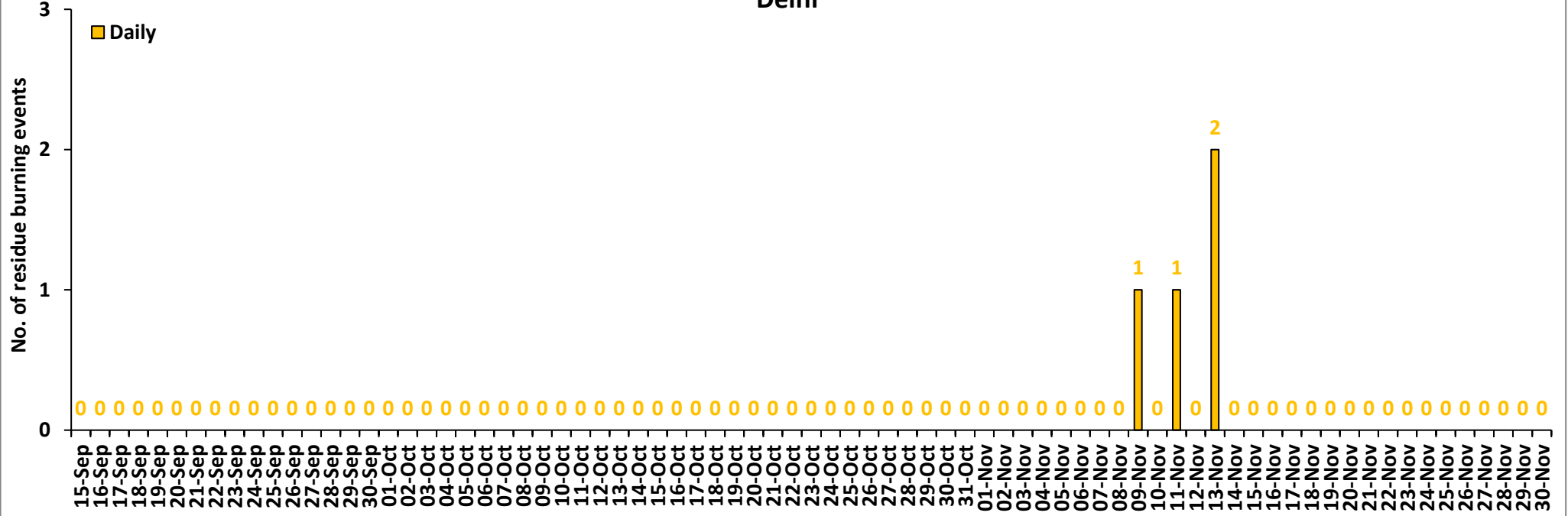
Rajasthan



Madhya Pradesh

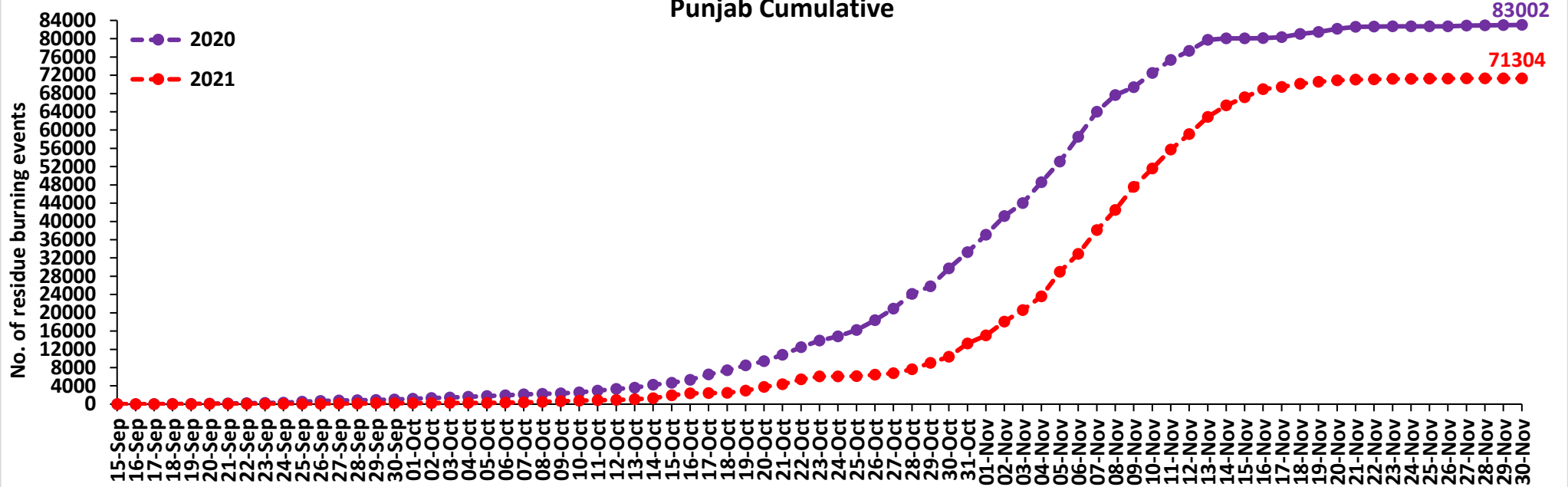


Delhi

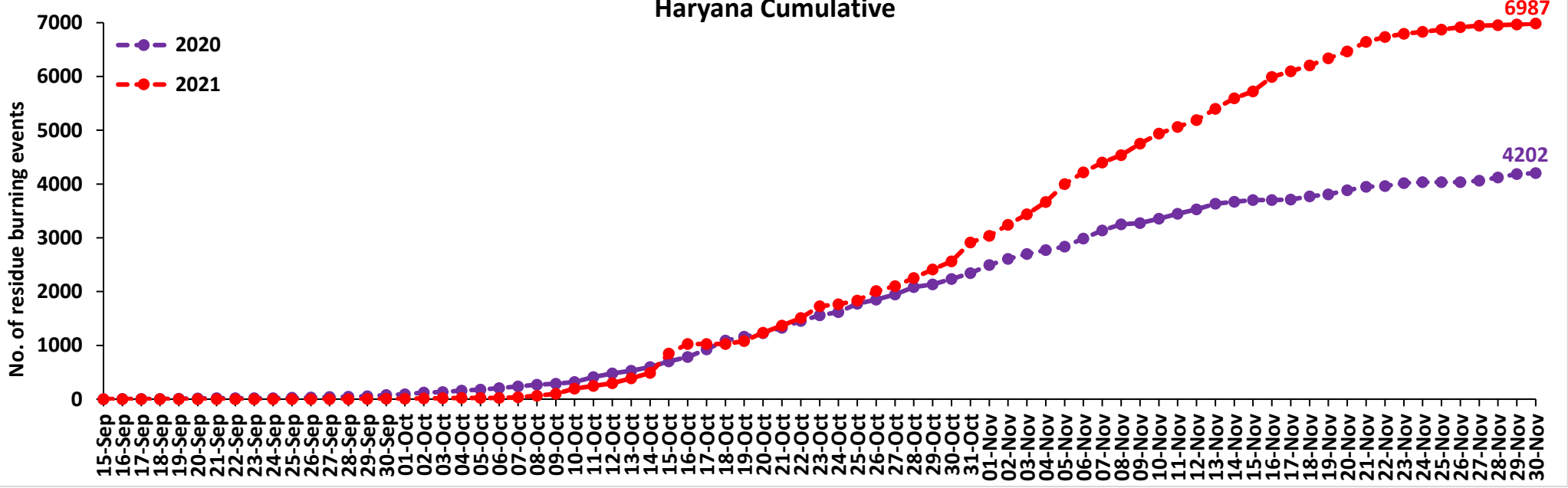


Comparison of residue burning events in current year (2021) with previous year (2020) for the study States

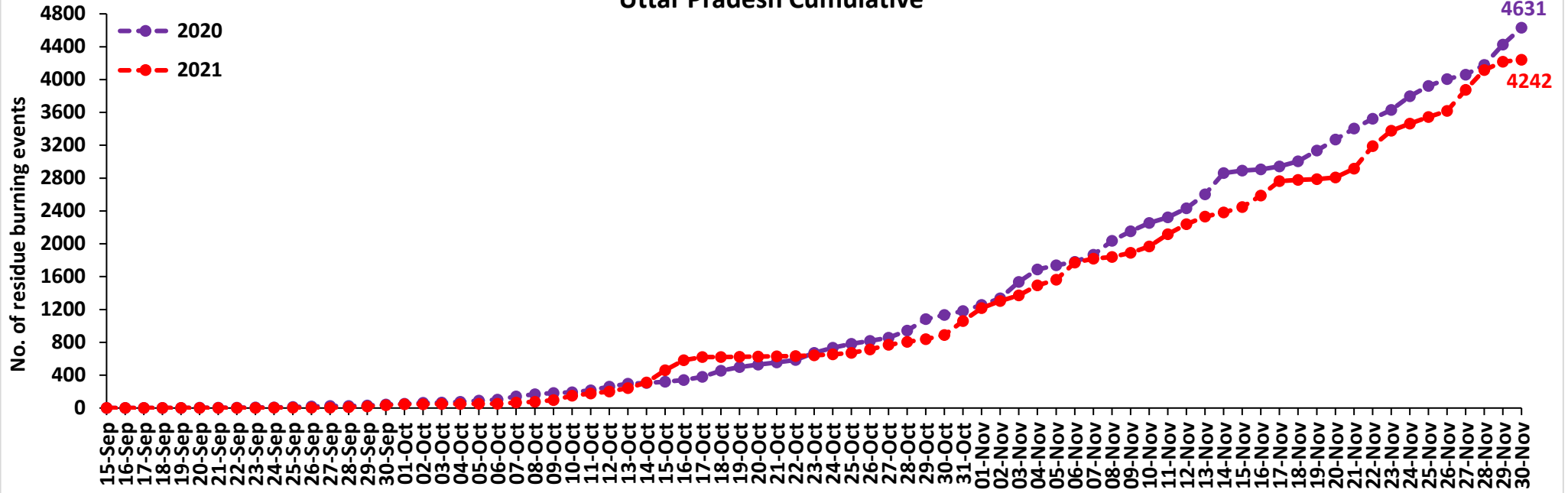
Punjab Cumulative



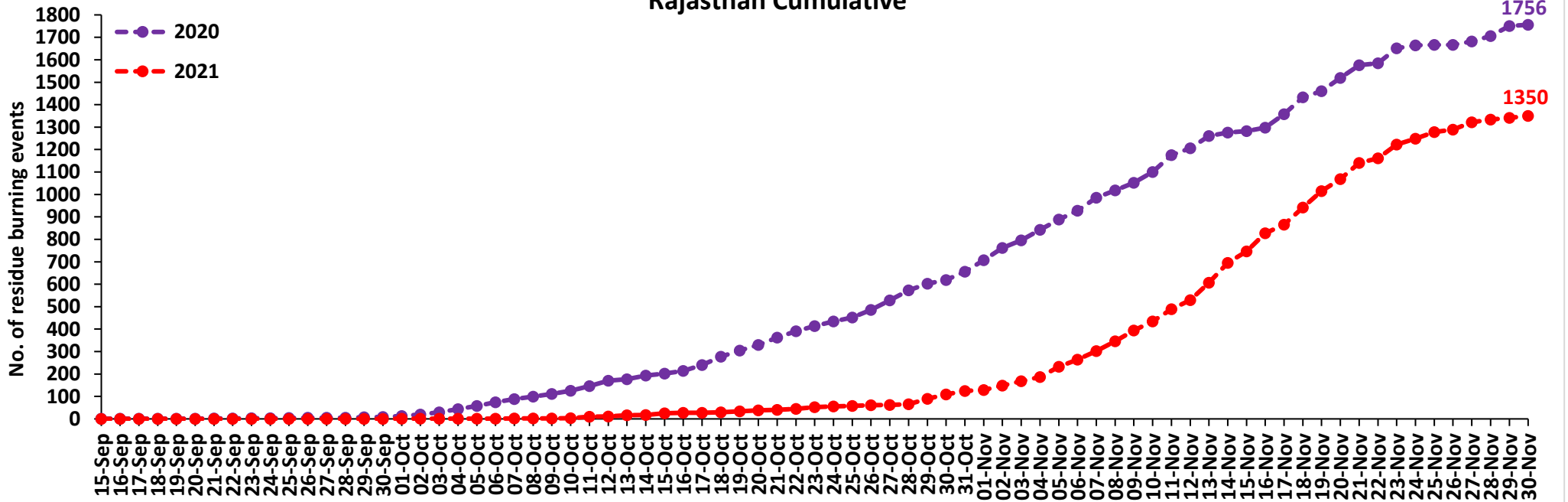
Haryana Cumulative



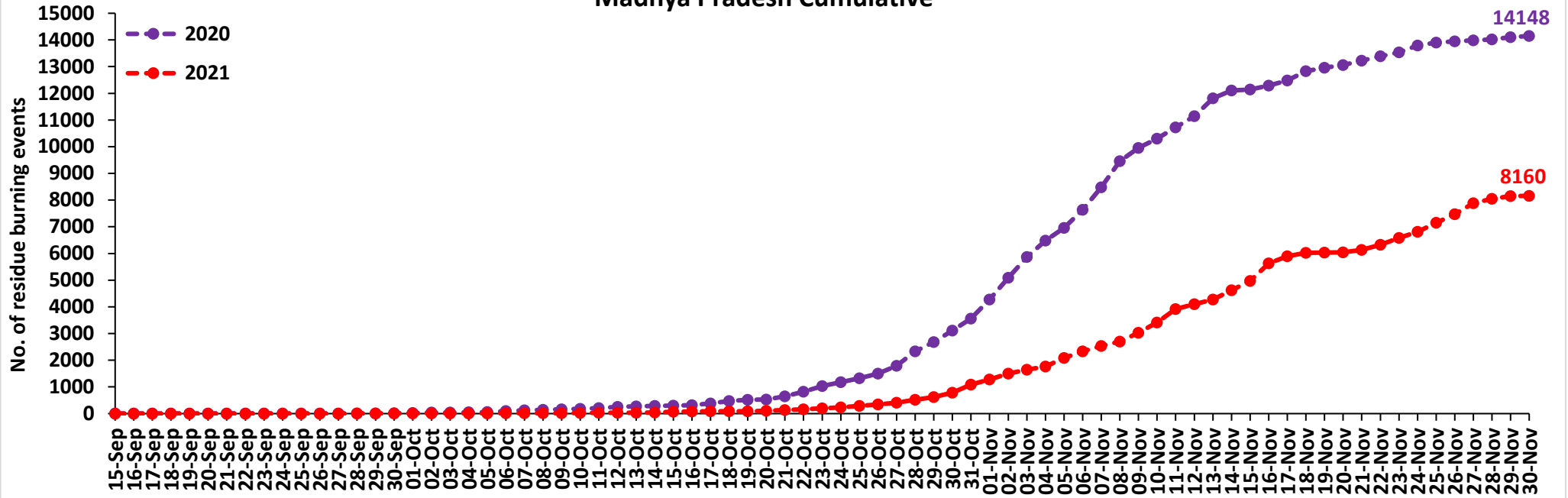
Uttar Pradesh Cumulative



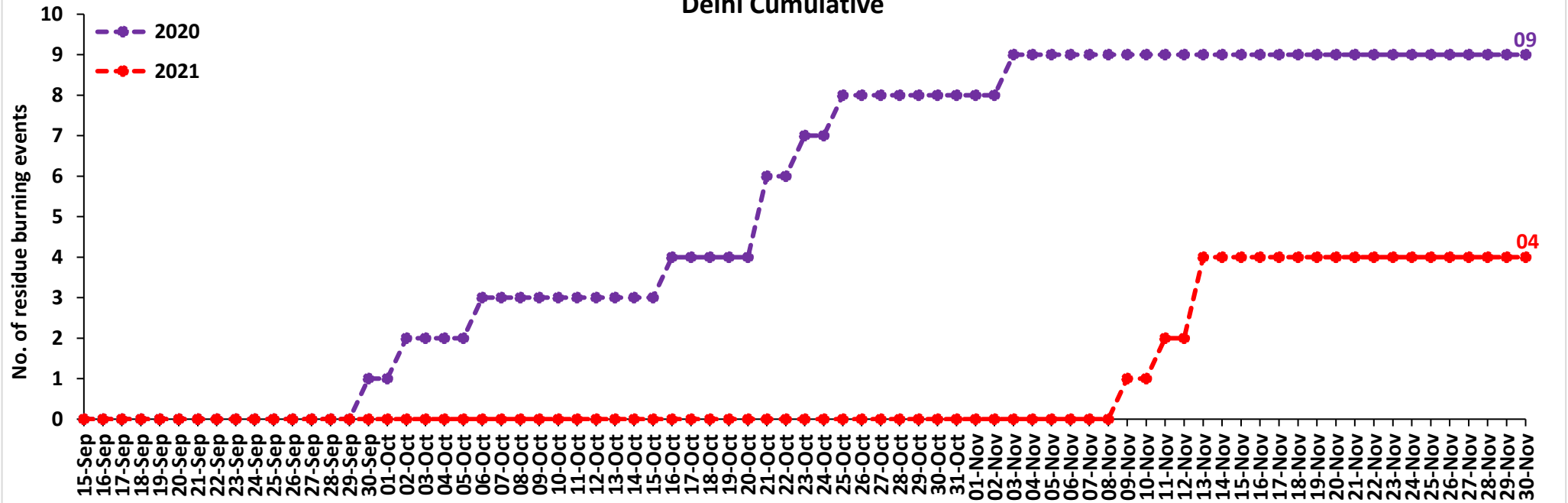
Rajasthan Cumulative



Madhya Pradesh Cumulative

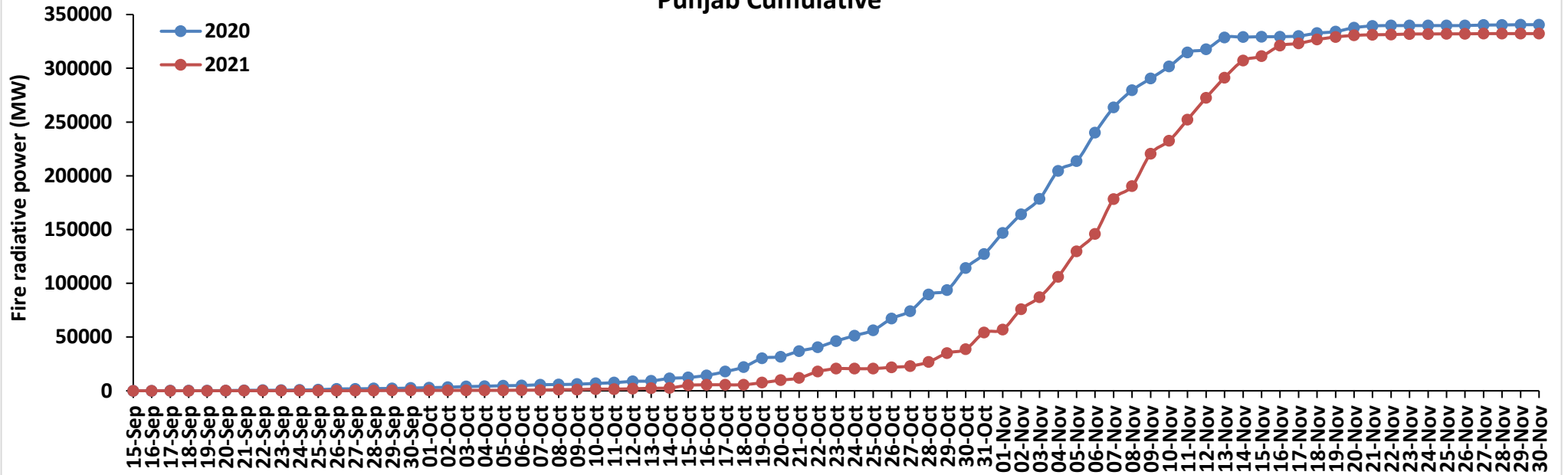


Delhi Cumulative

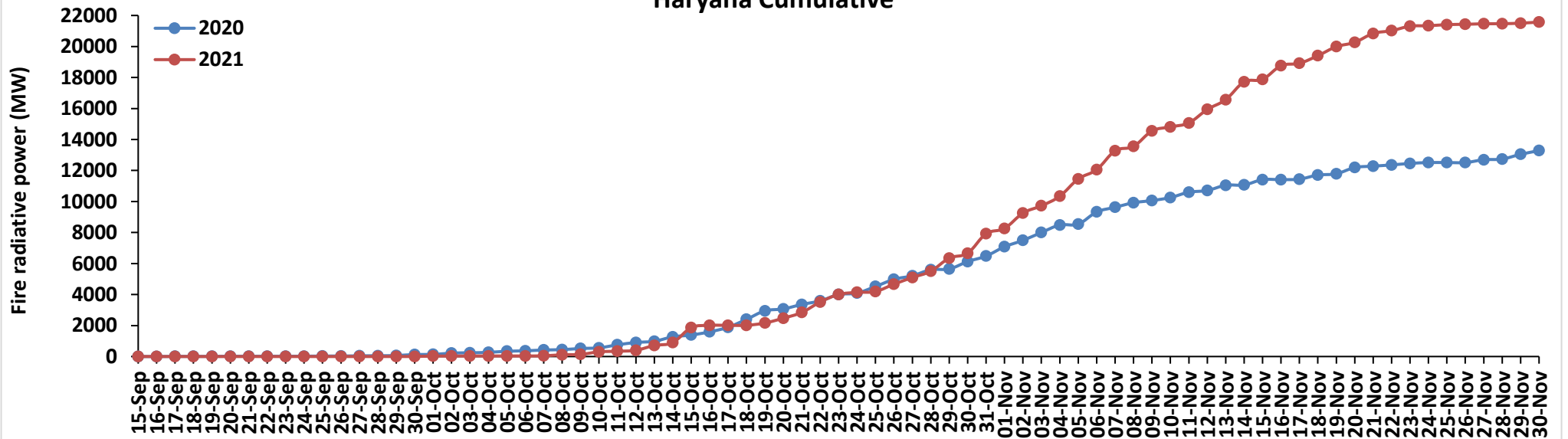


Comparison of residue burning fire power in current year (2021) with previous year (2020) for the study States

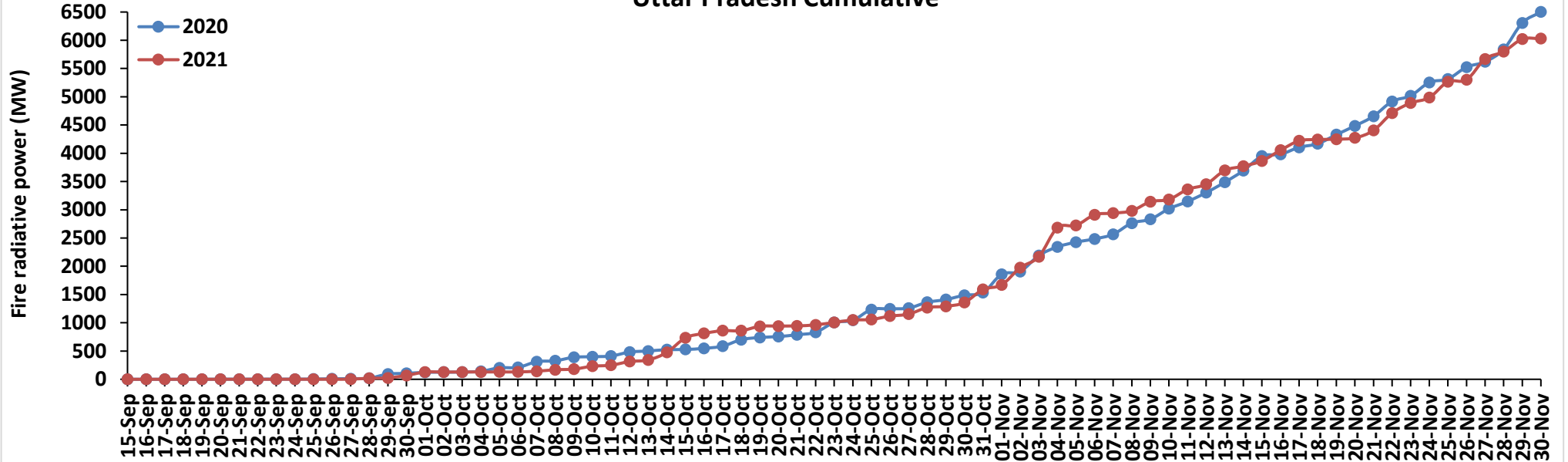
Punjab Cumulative



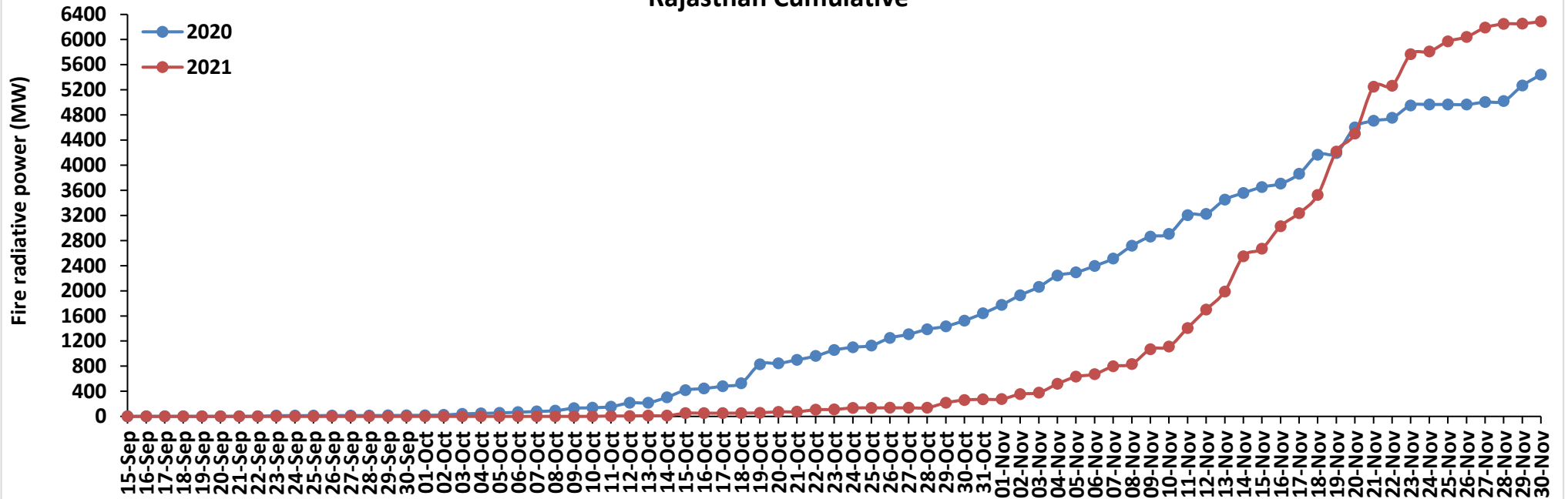
Haryana Cumulative



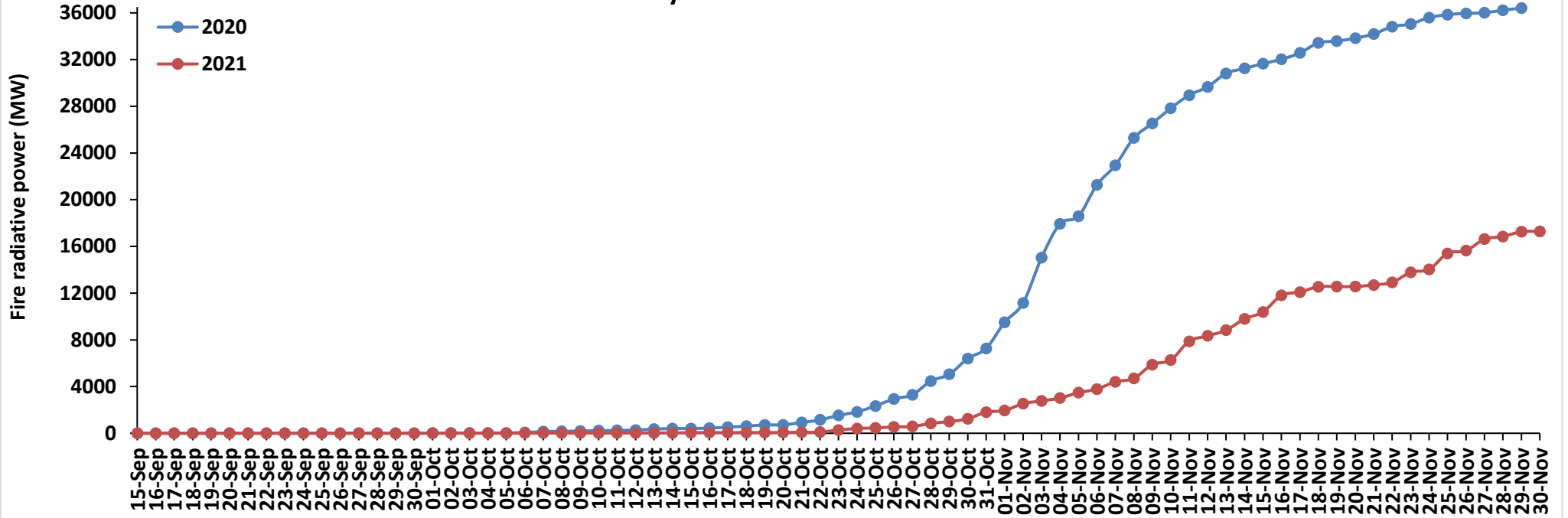
Uttar Pradesh Cumulative



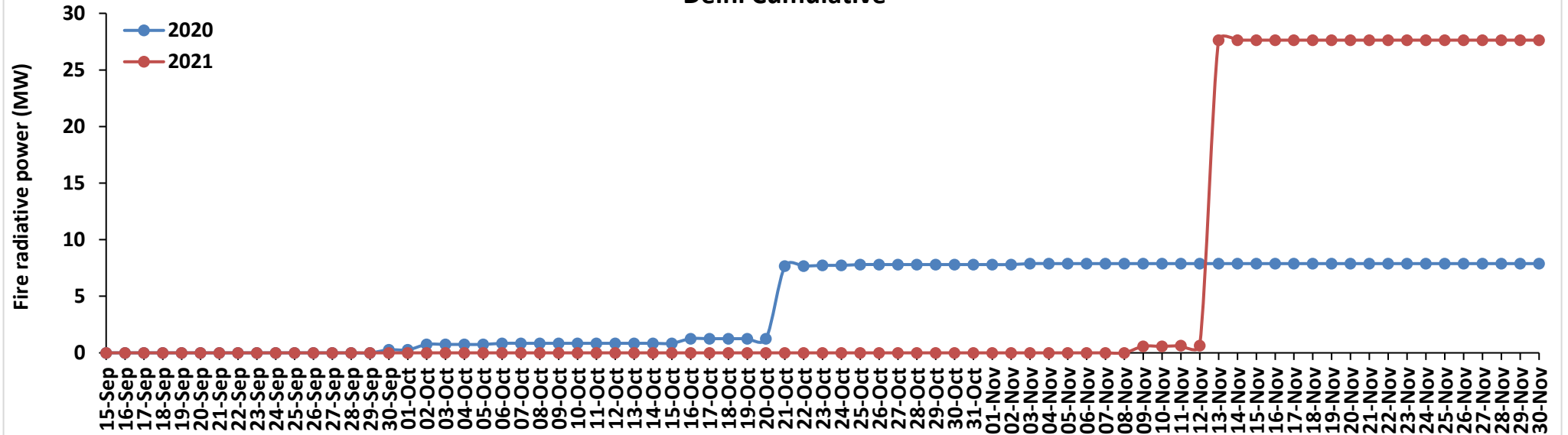
Rajasthan Cumulative



Madhya Pradesh Cumulative

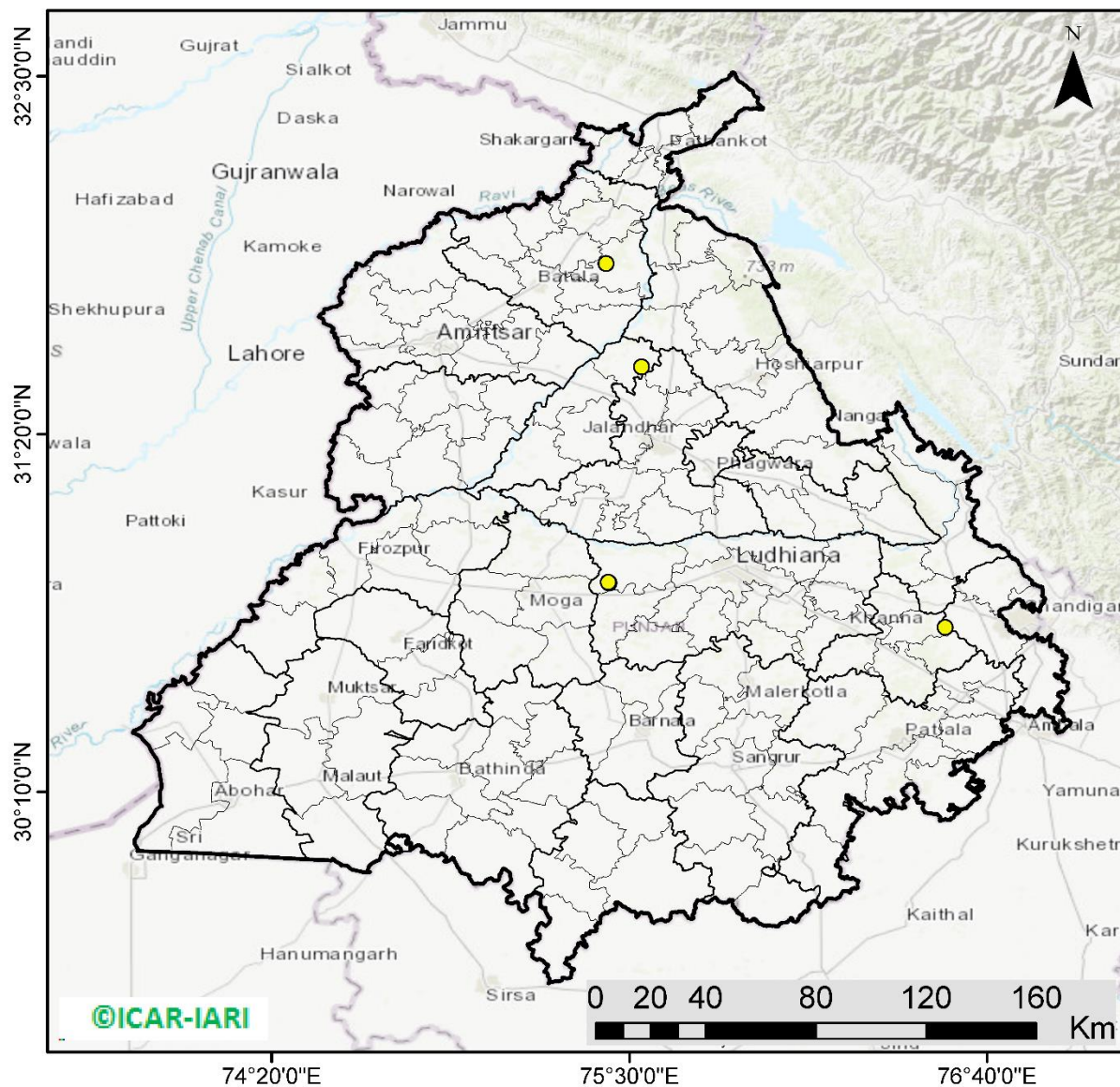


Delhi Cumulative



Punjab

RICE RESIDUE BURNING IN PUNJAB



05 burning events detected in Punjab on 30th November 2021

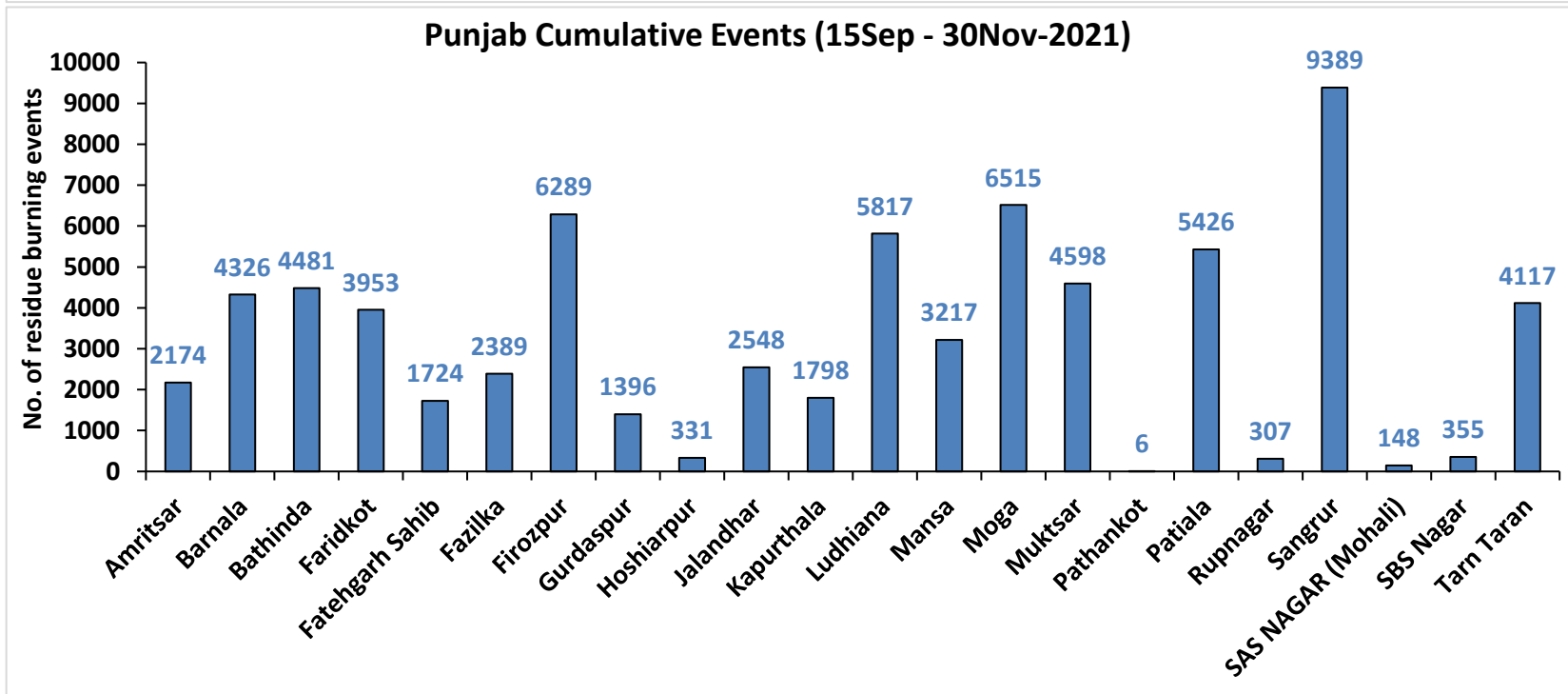
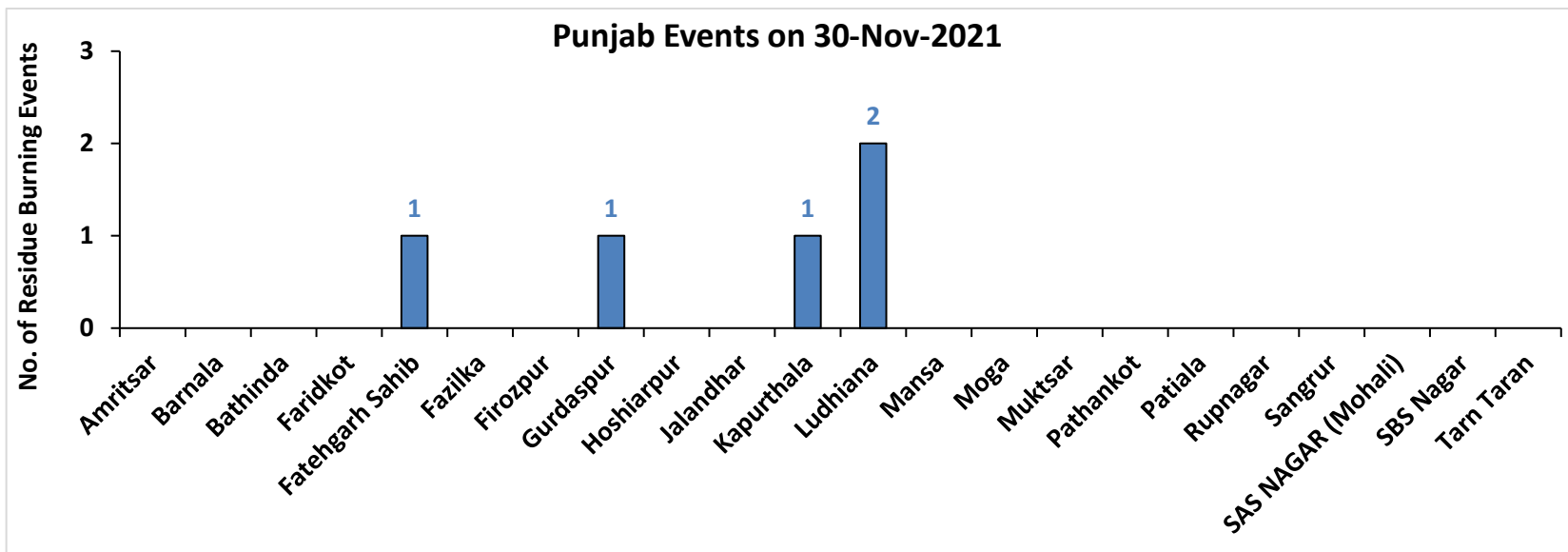
Fire Intensity (W/m²)

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



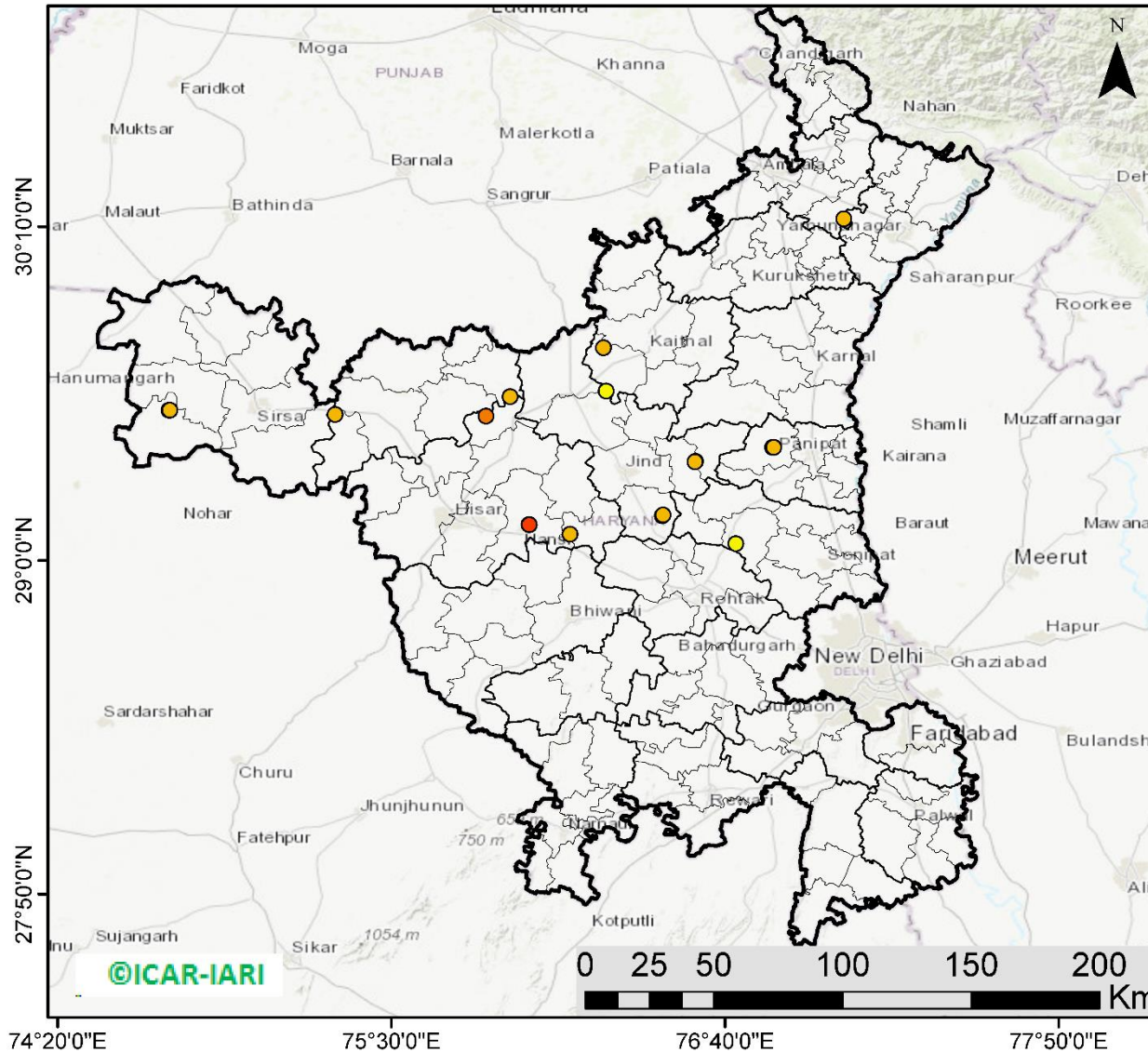
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15 Sep - 30 Nov-2021)



Haryana

RICE RESIDUE BURNING IN HARYANA



18 burning events detected in Haryana on 30th November 2021

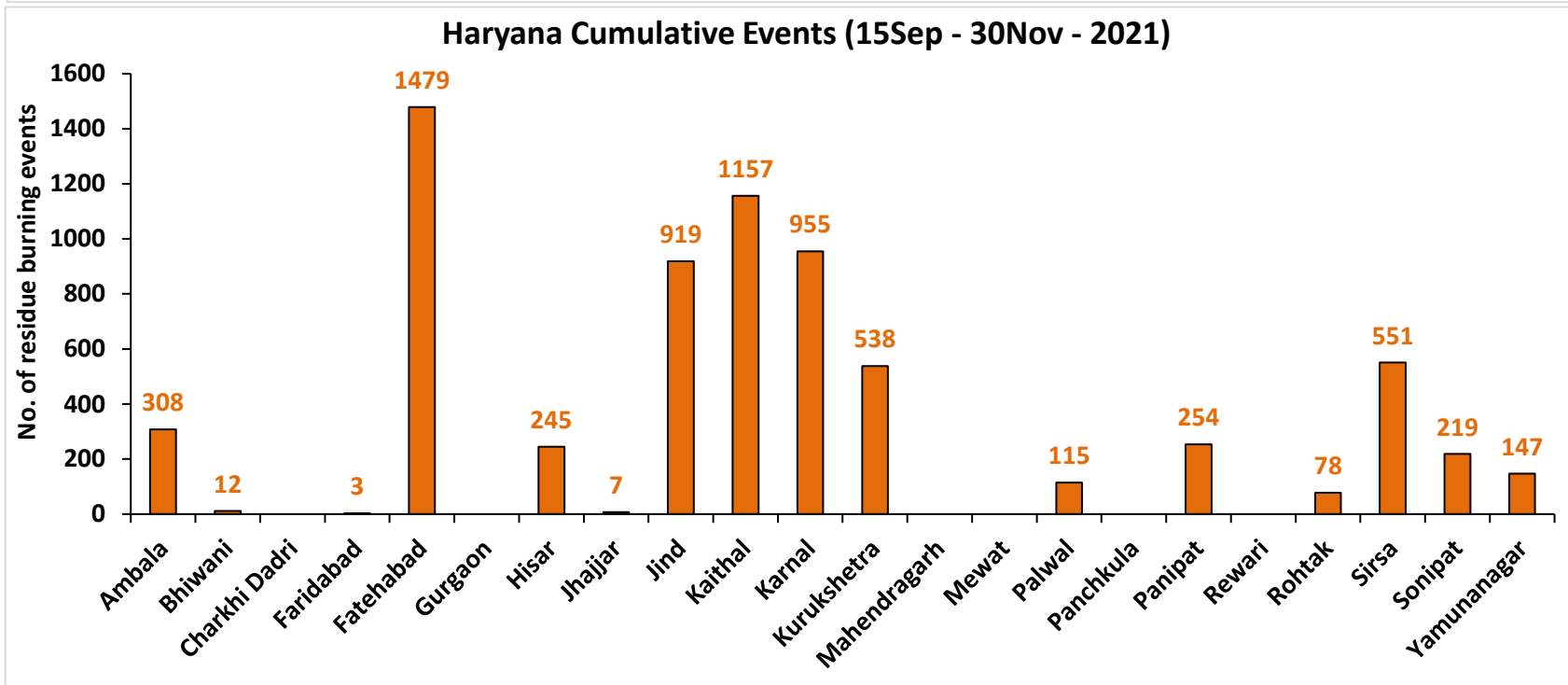
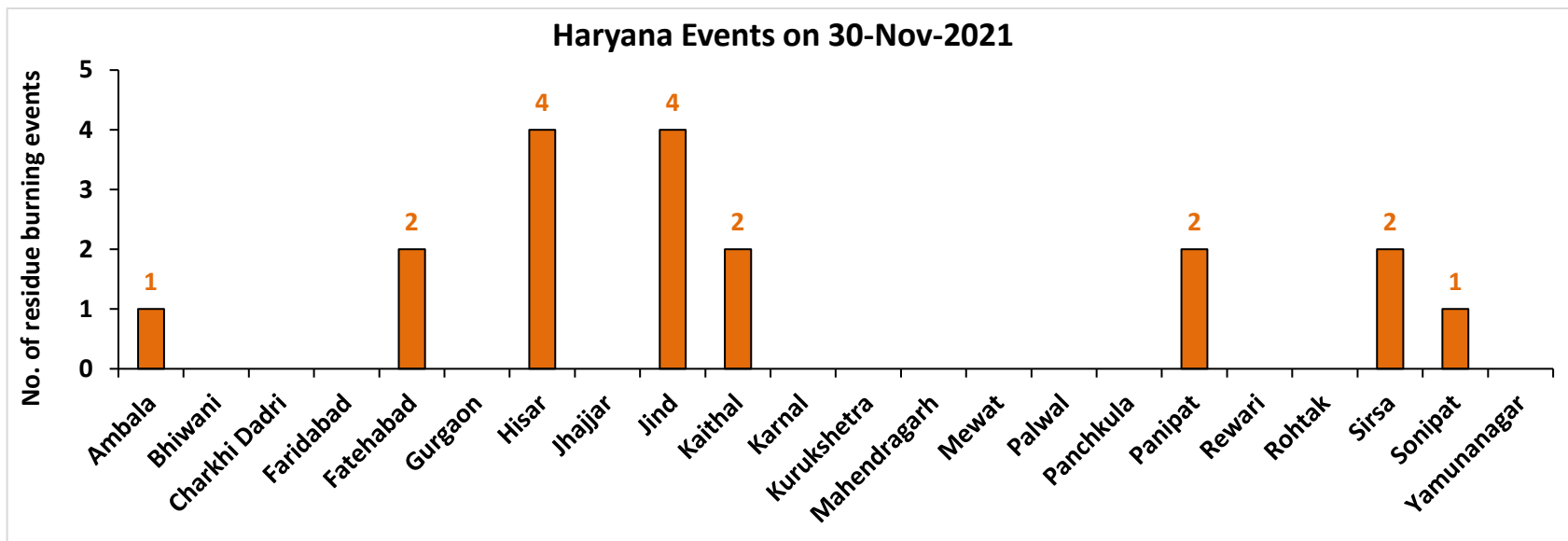
Fire Intensity (W/m²)

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



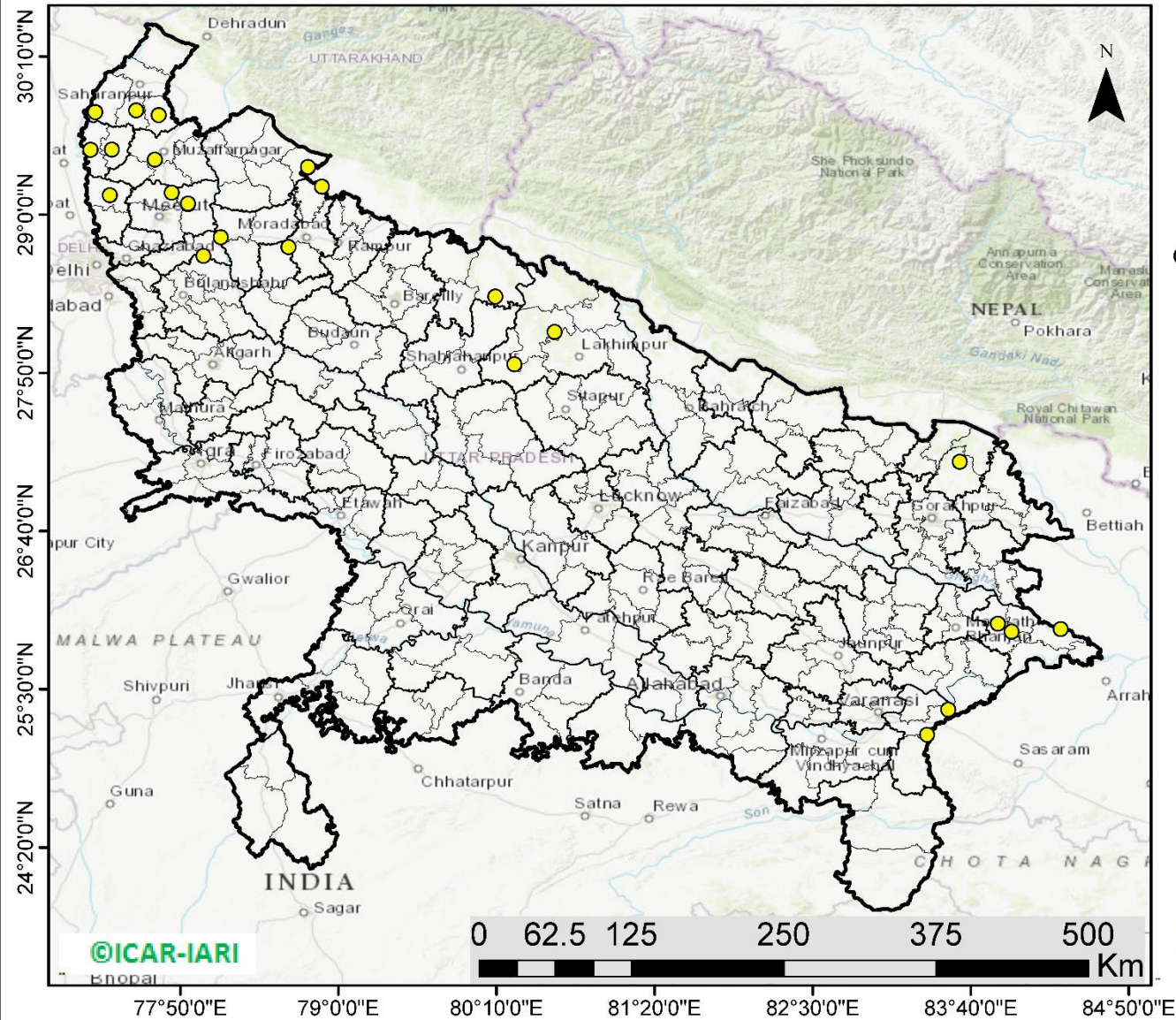
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15 Sep - 30 Nov-2021)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



26 burning events detected in Uttar Pradesh on 30th November 2021

Fire Intensity (W/m²)

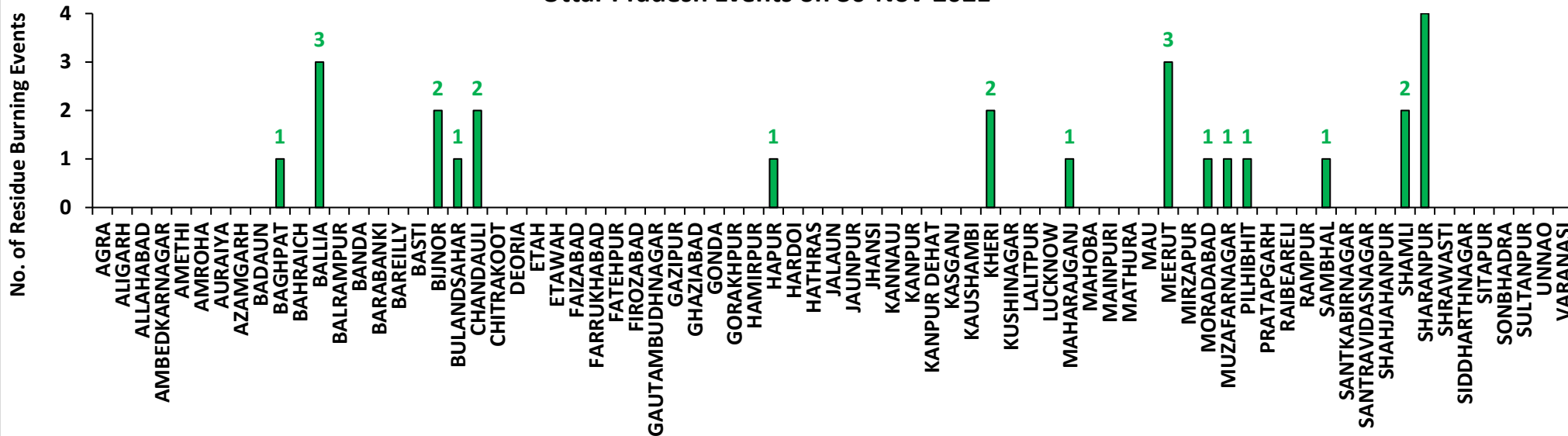
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



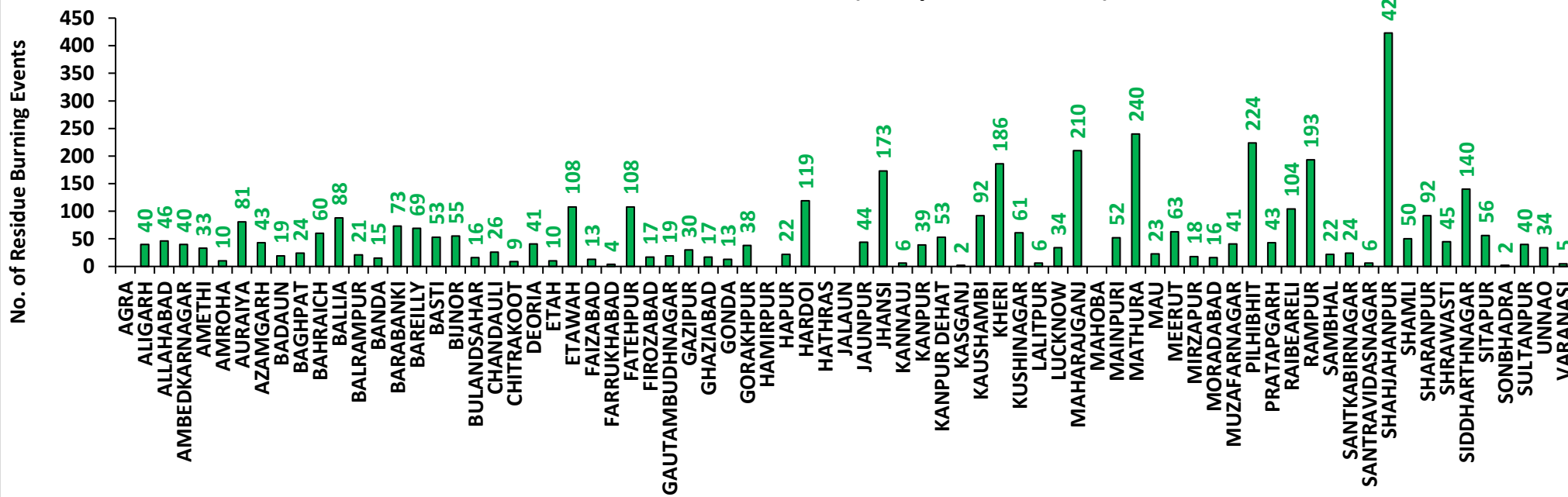
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Uttar Pradesh (15 Sep - 30 Nov-2021)

Uttar Pradesh Events on 30-Nov-2021

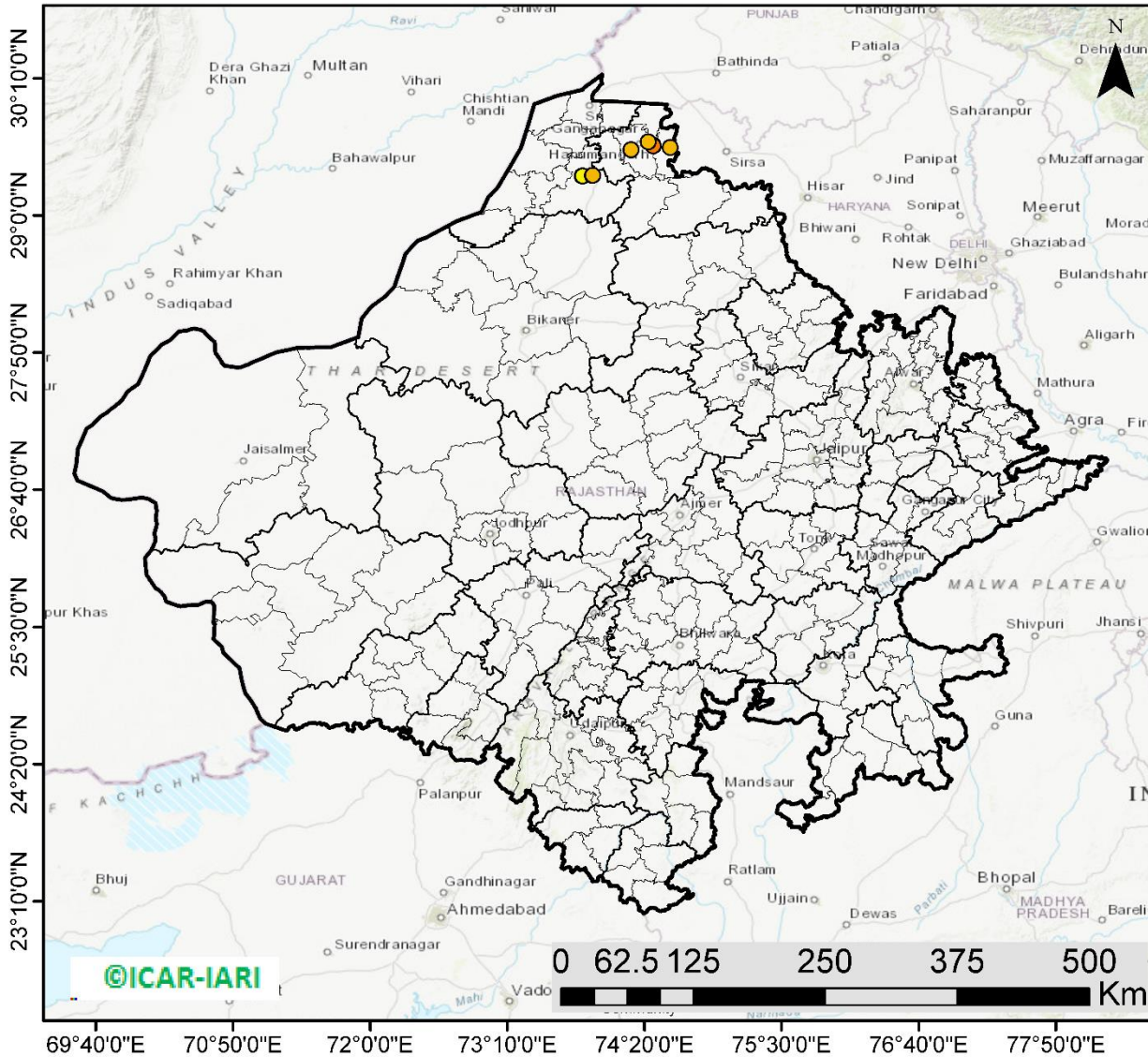


Uttar Pradesh Cumulative Events (15Sep - 30Nov-2021)



Rajasthan

RICE RESIDUE BURNING IN RAJASTHAN



09 burning events detected in Rajasthan on **30th November 2021**

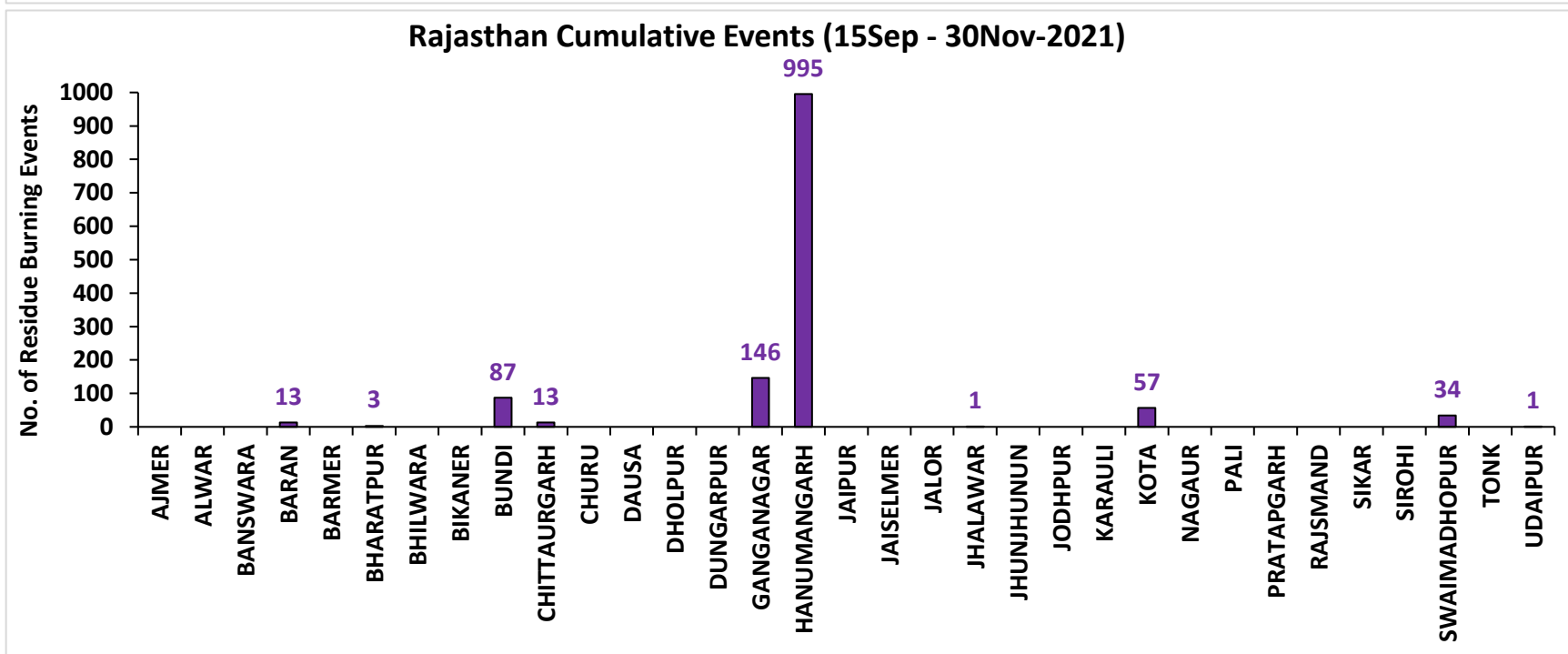
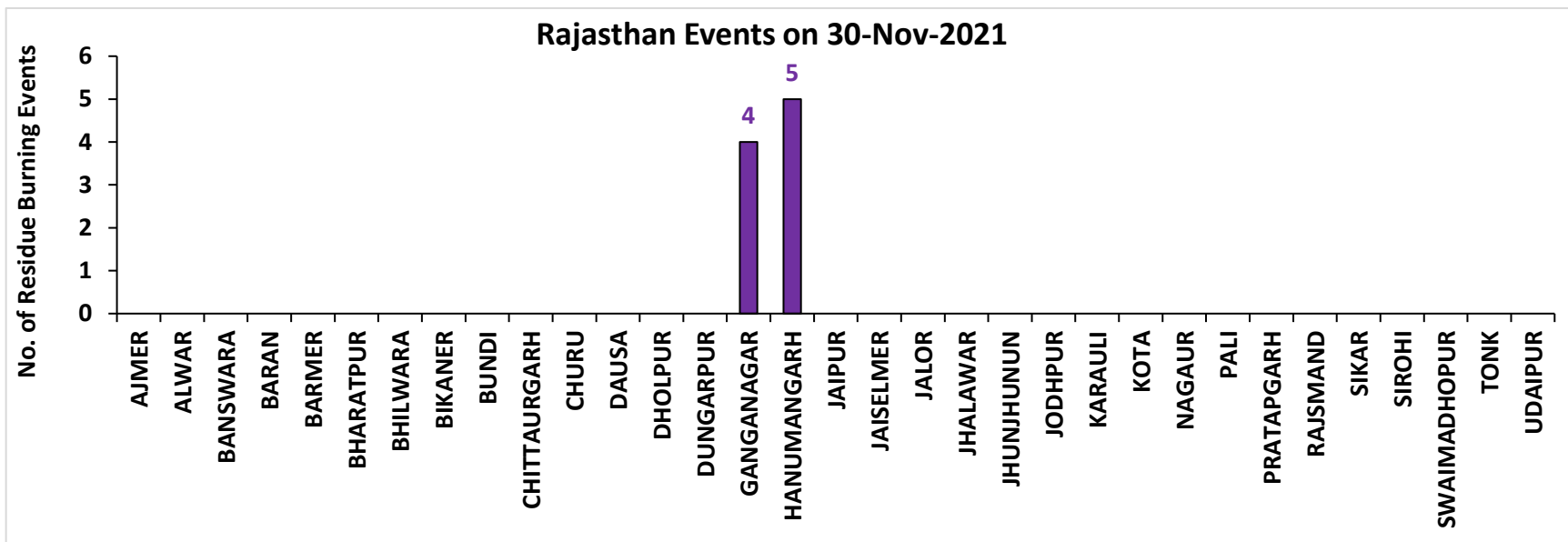
Fire Intensity (W/m²)

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



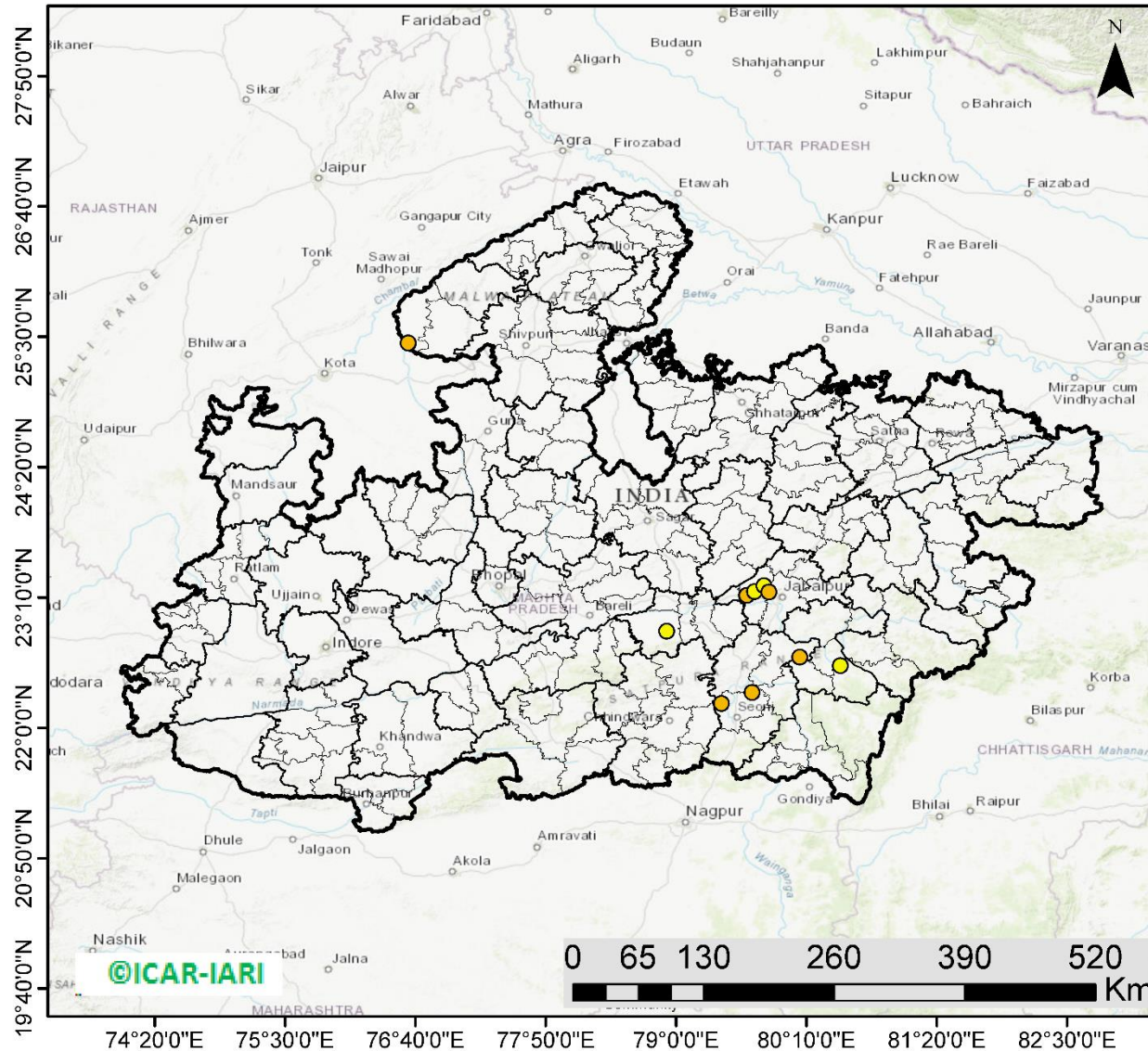
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Rajasthan (15 Sep - 30 Nov-2021)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



14 burning events detected in MP on 30th November 2021

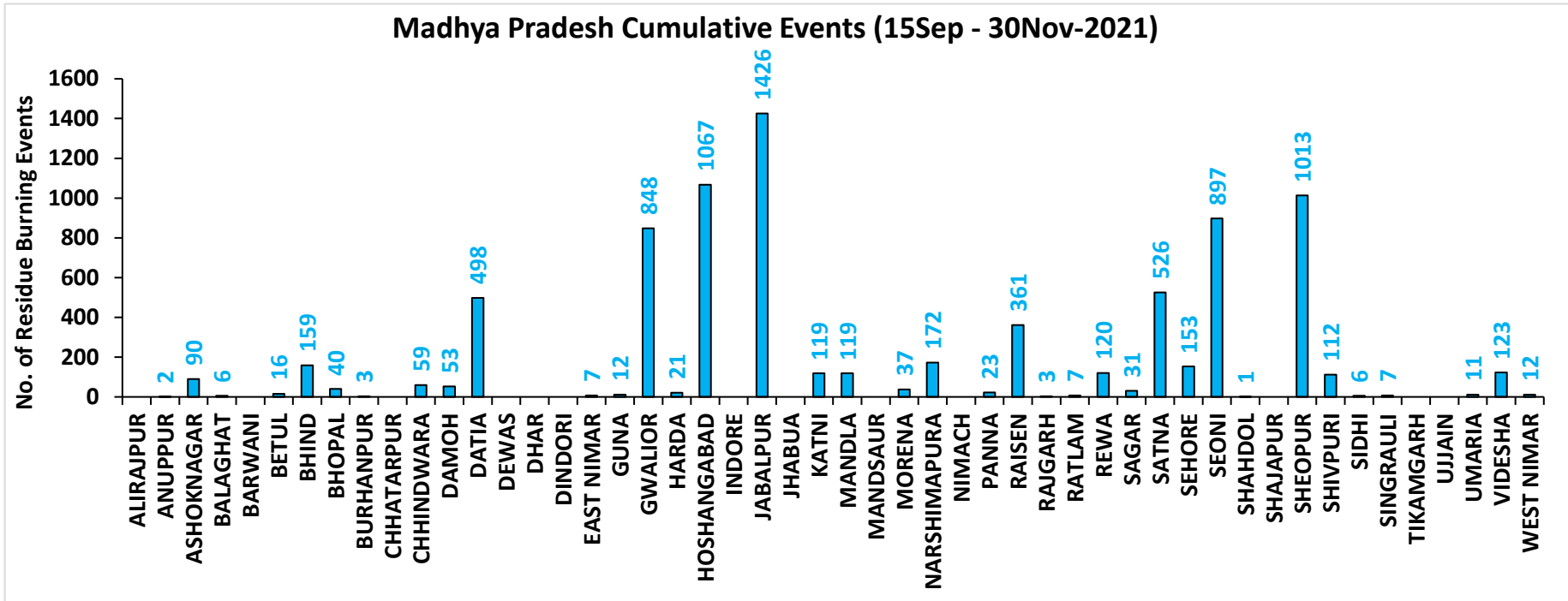
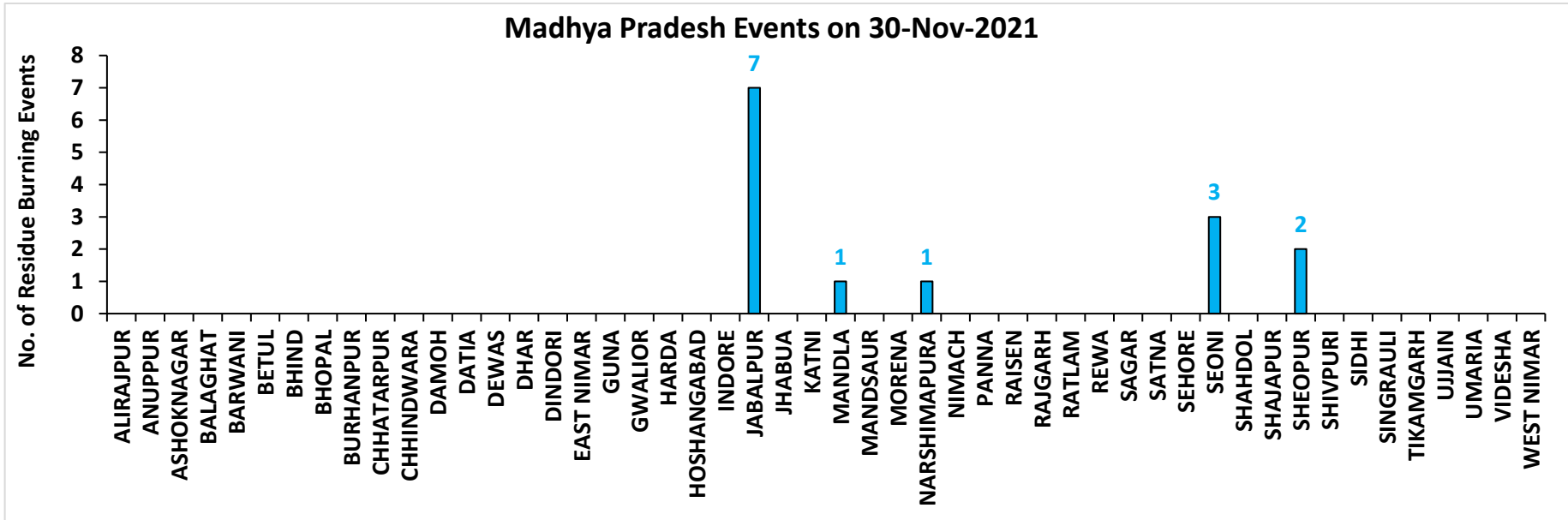
Fire Intensity (W/m²)

- 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 Madhya Pradesh (15 Sep - 30 Nov-2021)



District-wise cumulative number of residues burning events detected in 2020 and 2021
(Period: 15 September - 30 November)

(a) Punjab

District	15 Sep – 30 Nov	
	2020	2021
AMRITSAR	3067	2174
BARNALA	5342	4326
BATHINDA	5239	4481
FARIDKOT	4734	3953
FATEHGARH SAHIB	1536	1724
FAZILKA	2616	2389
FIROZPUR	8525	6289
GURDASPUR	2132	1396
HOSHIARPUR	388	331
JALANDHAR	1951	2548
KAPURTHALA	1886	1798
LUDHIANA	5065	5817
MANSA	3786	3217
MOGA	7421	6515
MUKTSAR	5072	4598
PATHANKOT	13	6
PATIALA	6433	5426
RUPNAGAR	205	307
SANGRUR	11727	9389
SAS NAGAR (MOHALI)	127	148
SBS NAGAR	132	355
TARN TARAN	5605	4117
Total	83002	71304

(b) Haryana

District	15 Sep – 30 Nov	
	2020	2021
AMBALA	346	308
BHIWANI	5	12
CHARKHI DADRI	0	0
FARIDABAD	1	3
FATEHABAD	880	1479
GURGAON	0	0
HISAR	56	245
JHAJJAR	6	7
JIND	347	919
KAITHAL	840	1157
KARNAL	592	955
KURUKSHETRA	406	538
MAHENDRAGARH	0	0
MEWAT	0	0
PALWAL	46	115
PANCHKULA	0	0
PANIPAT	55	254
REWARI	0	0
ROHTAK	50	78
SIRSA	357	551
SONIPAT	72	219
YAMUNANAGAR	143	147
Total	4202	6987

(c) Uttar Pradesh

District	15 Sep – 30 Nov							
	2020	2021						
			GAUTAMBUDHNAGAR	16	19	MUZAFARNAGAR	66	41
AGRA	7	0	GAZIPUR	41	30	PILHIBHIT	36	224
ALIGARH	114	40	GHAZIABAD	29	17	PRATAPGARH	46	43
ALLAHABAD	56	46	GONDA	14	13	RAIBEARELI	49	104
AMBEDKARNAGAR	55	40	GORAKHPUR	47	38	RAMPUR	167	193
AMETHI	15	33	HAMIRPUR	7	0	SAMBHAL	22	22
AMROHA	24	10	HAPUR	42	22	SANTKABIRNAGAR	33	24
AURAIYA	105	81	HARDOI	112	119	SANTRAVIDASNAGAR	5	6
AZAMGARH	68	43	HATHRAS	0	0	SHAHJAHANPUR	161	423
BADAUN	15	19	JALAUN	51	0	SHAMLI	52	50
BAGHPAT	28	24	JAUNPUR	59	44	SHARANPUR	110	92
BAHRAICH	110	60	JHANSI	380	173	SHRAWASTI	48	45
BALLIA	174	88	KANNAUJ	34	6	SIDDHARTHANAGAR	77	140
BALRAMPUR	69	21	KANPUR	45	39	SITAPUR	84	56
BANDA	50	15	KANPUR DEHAT	102	53	SONBHADRA	1	2
BARABANKI	36	73	KASGANJ	3	2	SULTANPUR	15	40
BAREILLY	95	69	KAUSHAMBI	101	92	UNNAO	52	34
BASTI	58	53	KHERI	214	186	VARANASI	2	5
BIJNOR	57	55	KUSHINAGAR	88	61	Total	4631	4242
BULANDSAHAR	75	16	LALITPUR	3	6			
CHANDAULI	53	26	LUCKNOW	35	34			
CHITRAKOOT	19	9	MAHARAJGANJ	64	210			
DEORIA	90	41	MAHOBA	27	0			
ETAH	17	10	MAINPURI	69	52			
ETAWAH	93	108	MATHURA	161	240			
FAIZABAD	16	13	MAU	43	23			
FARRUKHABAD	7	4	MEERUT	99	63			
FATEHPUR	138	108	MIRZAPUR	14	18			
FIROZABAD	27	17	MORADABAD	34	16			

(d) Delhi

District	15 Sep – 30 Nov	
	2020	2021
CENTRAL	0	0
EAST	0	0
NEW DELHI	0	0
NORTH	3	3
NORTH EAST	0	0
NORTH WEST DELHI	3	1
SHAHADRA	0	0
SOUTH	1	0
SOUTH EAST	0	0
SOUTH WEST DELHI	0	0
WEST DELHI	2	0
Total	9	4

(e) Rajasthan

District	15 Sep – 30 Nov	
	2020	2021
AJMER	3	0
ALWAR	10	0
BANSWARA	0	0
BARAN	167	13
BARMER	4	0
BHARATPUR	2	3
BHILWARA	11	0
BIKANER	1	0
BUNDI	128	87
CHITTAURGARH	5	13
CHURU	0	0
DAUSA	1	0
DHOLPUR	0	0
DUNGARPUR	0	0
GANGANAGAR	226	146
HANUMANGARH	952	995
JAIPUR	4	0
JAISELMER	5	0
JALOR	2	0
JHALAWAR	10	1
JHUNJHUNUN	1	0
JODHPUR	5	0
KARALI	1	0
KOTA	116	57
NAGAUR	4	0
PALI	13	0
PRATAPGARH	8	0
RAJSMAND	1	0
SIKAR	1	0
SIROHI	3	0
SWAIMADHOPUR	65	34
TONK	5	0
UDAIPUR	2	1
Total	1756	1350

(f) Madhya Pradesh

District	15 Sep – 30 Nov				
	2020	2021			
			PANNA	50	23
ALIRAJPUR	0	0	RAISEN	619	361
ANUPPUR	3	2	RAJGARH	13	3
ASHOKNAGAR	156	90	RATLAM	10	7
BALAGHAT	9	6	REWA	143	120
BARWANI	6	0	SAGAR	28	31
BETUL	37	16	SATNA	577	526
BHIND	269	159	SEHORE	164	153
BHOPAL	52	40	SEONI	1234	897
BURHANPUR	16	3	SHAHDOL	3	1
CHHATARPUR	9	0	SHAJAPUR	22	0
CHHINDWARA	136	59	SHEOPUR	1862	1013
DAMOH	75	53	SHIVPURI	396	112
DATIA	1188	498	SIDHI	4	6
DEWAS	8	0	SINGRAULI	0	7
DHAR	48	0	TIKAMGARH	5	0
DINDORI	0	0	UJJAIN	18	0
EAST NIMAR	23	7	UMARIA	9	11
GUNA	70	12	VIDESHA	145	123
GWALIOR	2058	848	WEST NIMAR	68	12
HARDA	14	21	Total	14148	8160
HOSHANGABAD	1060	1067			
INDORE	4	0			
JABALPUR	2671	1426			
JHABUA	0	0			
KATNI	326	119			
MANDLA	152	119			
MANDSAUR	15	0			
MORENA	62	37			
NARSHIMAPURA	309	172			
NIMACH	2	0			

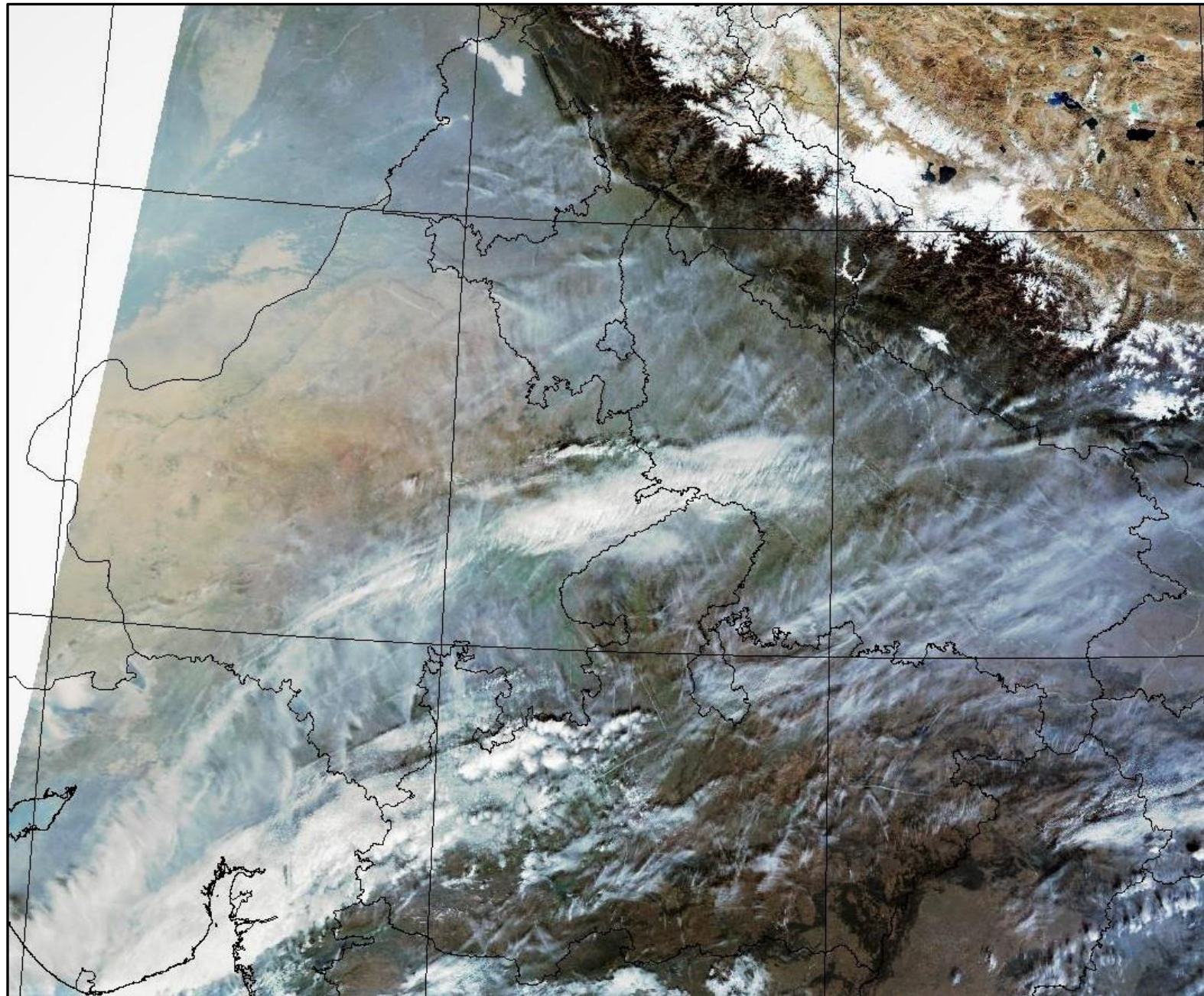
State-wise and date-wise number of paddy residue burning events detected in 2020 and 2021
(Period: 15 September – 30 November)

Number of Paddy Residue Burning Events Detected												
	Punjab		Haryana		Uttar Pradesh		Delhi		Rajasthan		Madhya Pradesh	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
15-Sep	5	0	2	0	1	0	0	0	1	0	2	0
16-Sep	0	2	1	0	0	0	0	0	0	0	0	0
17-Sep	5	0	3	0	0	0	0	0	0	0	0	0
18-Sep	17	9	0	0	0	1	0	0	0	0	0	0
19-Sep	30	5	2	0	0	1	0	0	0	0	0	0
20-Sep	67	8	6	0	2	0	0	0	0	0	0	0
21-Sep	54	0	2	0	1	0	0	0	1	0	2	0
22-Sep	34	0	1	0	1	0	0	0	0	0	0	0
23-Sep	49	0	0	0	1	0	0	0	1	0	0	0
24-Sep	78	5	0	0	1	1	0	0	0	0	0	0
25-Sep	184	11	11	0	5	0	0	0	1	0	0	0
26-Sep	190	19	5	0	8	0	0	0	1	0	2	0
27-Sep	78	37	8	0	4	1	0	0	0	0	1	0
28-Sep	55	28	6	1	1	6	0	0	0	0	1	1
29-Sep	63	64	9	4	6	10	0	0	3	0	0	4
30-Sep	116	27	22	2	13	13	1	0	1	0	5	0
01-Oct	165	13	15	4	7	13	0	0	4	1	13	0
02-Oct	141	0	30	2	12	0	1	0	7	0	12	0
03-Oct	110	9	8	6	4	3	0	0	9	0	5	1
04-Oct	162	23	29	2	8	0	0	0	15	0	4	2
05-Oct	161	18	17	3	14	2	0	0	14	0	13	1
06-Oct	171	42	30	0	12	1	1	0	16	0	37	1
07-Oct	197	72	32	11	41	13	0	0	14	1	31	1
08-Oct	95	108	29	27	25	11	0	0	11	0	17	2
09-Oct	121	114	20	39	15	20	0	0	12	0	15	4
10-Oct	232	150	33	95	9	54	0	0	14	1	18	10
11-Oct	377	64	90	51	23	28	0	0	21	7	32	2

12-Oct	388	97	69	51	46	23	0	0	24	1	44	1
13-Oct	266	132	47	91	36	42	0	0	7	5	21	2
14-Oct	605	229	69	98	9	68	0	0	16	1	15	11
15-Oct	449	660	106	363	15	149	0	0	9	8	8	27
16-Oct	654	429	80	176	21	121	1	0	12	2	23	13
17-Oct	1172	14	143	0	38	39	0	0	26	0	63	1
18-Oct	938	57	166	1	76	0	0	0	37	2	88	0
19-Oct	1080	496	72	55	43	5	0	0	27	5	49	1
20-Oct	890	788	62	155	31	1	0	0	26	4	9	21
21-Oct	1392	597	101	131	25	5	2	0	32	2	112	30
22-Oct	1665	1111	128	140	32	3	0	0	29	5	183	29
23-Oct	1438	620	106	218	84	8	1	0	23	7	204	32
24-Oct	911	0	57	38	63	11	0	0	20	4	150	34
25-Oct	1416	76	155	71	50	18	1	0	18	2	144	60
26-Oct	2126	329	77	175	33	41	0	0	34	3	178	55
27-Oct	2563	279	96	93	40	58	0	0	42	1	294	62
28-Oct	3232	906	139	149	87	35	0	0	45	4	537	110
29-Oct	1624	1353	52	161	139	32	0	0	29	23	349	97
30-Oct	3946	1373	100	148	50	53	0	0	17	20	428	168
31-Oct	3531	2895	108	353	49	170	0	0	37	15	455	299
01-Nov	3835	1796	151	124	74	157	0	0	51	5	709	198
02-Nov	4098	3001	111	203	82	87	0	0	55	19	820	214
03-Nov	2818	2512	93	197	197	66	1	0	34	20	771	148
04-Nov	4584	3032	72	228	152	123	0	0	46	19	618	123
05-Nov	4529	5327	66	331	52	70	0	0	46	45	474	320
06-Nov	5382	3942	151	219	43	208	0	0	40	32	678	248
07-Nov	5491	5199	150	182	86	46	0	0	57	38	848	199
08-Nov	3674	4397	115	138	169	21	0	0	33	44	981	170
09-Nov	1718	5079	21	217	115	51	0	1	34	48	495	330
10-Nov	3127	4008	80	184	101	77	0	0	48	40	346	380
11-Nov	2822	4156	93	126	71	151	0	1	75	55	418	506
12-Nov	1989	3403	83	127	108	120	0	0	31	40	422	185
13-Nov	2441	3742	105	210	172	95	0	2	54	78	670	171
14-Nov	307	2541	35	195	258	49	0	0	16	88	294	346
15-Nov	32	1761	31	129	29	67	0	0	6	51	35	353
16-Nov	8	1757	0	269	15	138	0	0	16	81	145	660

17-Nov	248	523	9	101	38	177	0	0	60	38	191	261
18-Nov	670	680	60	111	62	14	0	0	75	77	352	126
19-Nov	454	448	37	132	129	11	0	0	27	73	124	16
20-Nov	677	283	77	127	134	20	0	0	59	53	106	6
21-Nov	457	168	65	178	135	106	0	0	57	72	159	95
22-Nov	46	66	15	91	120	276	0	0	9	21	165	188
23-Nov	43	91	52	59	106	186	0	0	66	61	150	262
24-Nov	9	34	20	37	167	87	0	0	13	26	258	224
25-Nov	0	31	1	41	127	80	0	0	2	30	106	343
26-Nov	16	21	0	48	83	74	0	0	0	11	48	318
27-Nov	124	19	26	28	54	257	0	0	16	33	39	416
28-Nov	84	5	57	9	118	241	0	0	24	12	38	163
29-Nov	55	8	65	14	247	101	0	0	44	7	83	95
30-Nov	21	5	17	18	206	26	0	0	6	9	41	14
Total	83002	71304	4202	6987	4631	4242	9	4	1756	1350	14148	8160

Terra (MODIS) Satellite image (TCC) of North and Central India Acquired on 30-Nov-2021 at 10:36:00 IST by IARI Ground Station



Details of residue burning events in Punjab on 30-Nov-2021

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	FATEHGARH SAHIB	BASSI PATHANAN	S-NPP	30.70300	76.53030	11/30/2021	14:01:00	D	3.00
2	GURDASPUR	KAHNUWAN	S-NPP	31.88910	75.42410	11/30/2021	14:01:00	D	2.80
3	KAPURTHALA	NADALA	S-NPP	31.55230	75.53950	11/30/2021	14:01:00	D	2.40
4	LUDHIANA	SIDHWAN BET	S-NPP	30.84750	75.43360	11/30/2021	14:01:00	D	8.90
5	LUDHIANA	SIDHWAN BET	S-NPP	30.85000	75.43110	11/30/2021	14:01:00	D	4.40

Details of residue burning events in Haryana on 30-Nov-2021

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	AMBALA	BARARA	S-NPP	30.19440	77.08230	11/30/2021	12:21:25	D	6.10
2	FATEHABAD	FATEHABAD	S-NPP	29.50980	75.30370	11/30/2021	14:01:00	D	7.10
3	FATEHABAD	TOHANA	AQUA	29.57200	75.91600	11/30/2021	13:56:54	D	8.10
4	HISAR	HANSI-I	S-NPP	29.12480	75.98210	11/30/2021	14:01:00	D	4.00
5	HISAR	HANSI-I	AQUA	29.12400	75.98300	11/30/2021	13:56:54	D	17.90
6	HISAR	HANSI-II	AQUA	29.09100	76.12500	11/30/2021	13:56:54	D	7.80
7	HISAR	UKLANA	AQUA	29.50400	75.83100	11/30/2021	13:56:54	D	10.60
8	JIND	JULANA	S-NPP	29.15590	76.44770	11/30/2021	14:01:00	D	5.40
9	JIND	JULANA	S-NPP	29.15850	76.45020	11/30/2021	14:01:00	D	6.40
10	JIND	PILLUKHERA	S-NPP	29.34590	76.56330	11/30/2021	14:01:00	D	4.00
11	JIND	PILLUKHERA	AQUA	29.34400	76.56200	11/30/2021	13:56:54	D	9.60
12	KAITHAL	KALAYAT	S-NPP	29.59140	76.25180	11/30/2021	14:01:00	D	2.80
13	KAITHAL	KALAYAT	AQUA	29.74300	76.24200	11/30/2021	13:56:54	D	8.10
14	PANIPAT	MADLAUDA	S-NPP	29.39480	76.83330	11/30/2021	14:01:00	D	4.70
15	PANIPAT	MADLAUDA	S-NPP	29.39480	76.83740	11/30/2021	14:01:00	D	6.20
16	SIRSA	ELLENABAD	S-NPP	29.52450	74.72280	11/30/2021	14:01:00	D	8.80
17	SIRSA	ELLENABAD	S-NPP	29.52470	74.72580	11/30/2021	14:01:00	D	8.40
18	SONIPAT	GOHANA	S-NPP	29.05840	76.70510	11/30/2021	12:21:25	D	2.20

Details of residue burning events in Uttar Pradesh on 30-Nov-2021

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	BAGHPAT	BARAUT	S-NPP	29.14270	77.31390	11/30/2021	14:01:00	D	1.50
2	BALLIA	BANSDIH	S-NPP	25.94260	84.33000	11/30/2021	01:11:26	N	0.70
3	BALLIA	RASRA	S-NPP	25.98240	83.86740	11/30/2021	12:21:25	D	3.60
4	BALLIA	SIKANDARPUR	S-NPP	25.92430	83.96940	11/30/2021	12:21:25	D	1.50
5	BIJNOR	AFZALGARH	S-NPP	29.34850	78.77630	11/30/2021	14:01:00	D	3.30
6	BIJNOR	AFZALGARH	S-NPP	29.35130	78.77520	11/30/2021	14:01:00	D	3.90
7	BULANDSAHAR	SIYANA	S-NPP	28.69590	78.00450	11/30/2021	14:01:00	D	1.40
8	CHANDAULI	CHANDAULI	S-NPP	25.16390	83.34420	11/30/2021	12:21:25	D	2.30
9	CHANDAULI	CHANDAULI	S-NPP	25.34900	83.50110	11/30/2021	12:21:25	D	1.80
10	HAPUR	GARHMUKTESAR	S-NPP	28.83360	78.13200	11/30/2021	14:01:00	D	2.50
11	KHERI	GOLA	S-NPP	27.89650	80.29940	11/30/2021	12:21:25	D	2.80
12	KHERI	GOLA	S-NPP	28.13500	80.59610	11/30/2021	12:21:25	D	3.70
13	MAHARAJGANJ	MAHARAJGANJ	S-NPP	27.17820	83.58680	11/30/2021	12:21:25	D	3.00
14	MEERUT	MAWANA	S-NPP	29.07710	77.89110	11/30/2021	14:01:00	D	3.40
15	MEERUT	MAWANA	S-NPP	29.08240	77.89060	11/30/2021	14:01:00	D	1.60
16	MEERUT	SARDHANA	S-NPP	29.16270	77.77020	11/30/2021	14:01:00	D	1.10
17	MORADABAD	THAKUR DWARA	S-NPP	29.20630	78.87790	11/30/2021	01:11:26	N	0.60
18	MUZAFARNAGAR	MUZAFFARNAGAR	S-NPP	29.40610	77.64640	11/30/2021	14:01:00	D	1.70
19	PILHIBHIT	PURANPUR	S-NPP	28.39660	80.15880	11/30/2021	12:21:25	D	2.70
20	SAMBHAL	SAMBHAL	S-NPP	28.76080	78.63280	11/30/2021	14:01:00	D	2.30
21	SHAMLI	KAIRANA	S-NPP	29.47830	77.17240	11/30/2021	14:01:00	D	2.50
22	SHAMLI	SHAMLI	S-NPP	29.48060	77.32850	11/30/2021	14:01:00	D	1.90
23	SHARANPUR	DEOBAND	S-NPP	29.73460	77.67370	11/30/2021	14:01:00	D	2.30
24	SHARANPUR	NAKUR	S-NPP	29.75650	77.20620	11/30/2021	14:01:00	D	2.50
25	SHARANPUR	RAMPUR MANIHARRAN	S-NPP	29.76900	77.50850	11/30/2021	14:01:00	D	2.70
26	SHARANPUR	RAMPUR MANIHARRAN	S-NPP	29.76940	77.50790	11/30/2021	14:01:00	D	2.40

Details of residue burning events in Rajasthan on 30-Nov-2021

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	GANGANAGAR	SURATGARH	S-NPP	29.33370	73.80410	11/30/2021	14:01:00	D	4.00
2	GANGANAGAR	SURATGARH	S-NPP	29.33420	73.80840	11/30/2021	14:01:00	D	3.80
3	GANGANAGAR	SURATGARH	S-NPP	29.33850	73.89030	11/30/2021	14:01:00	D	4.50
4	GANGANAGAR	SURATGARH	S-NPP	29.33900	73.89460	11/30/2021	14:01:00	D	6.30
5	HANUMANGARH	HANUMANGARH	S-NPP	29.55680	74.22040	11/30/2021	14:01:00	D	8.30
6	HANUMANGARH	HANUMANGARH	AQUA	29.62400	74.36700	11/30/2021	13:56:54	D	6.40
7	HANUMANGARH	TIBI	S-NPP	29.59810	74.40580	11/30/2021	14:01:00	D	4.40
8	HANUMANGARH	TIBI	AQUA	29.57600	74.55200	11/30/2021	13:56:54	D	7.40
9	HANUMANGARH	TIBI	AQUA	29.59000	74.40900	11/30/2021	13:56:54	D	14.80

Details of residue burning events in Madhya Pradesh on 30-Nov-2021

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	JABALPUR	PATAN	S-NPP	23.21760	79.70290	11/30/2021	14:01:00	D	3.90
2	JABALPUR	PATAN	S-NPP	23.27000	79.78660	11/30/2021	14:01:00	D	3.90
3	JABALPUR	PATAN	TERRA	23.21400	79.83200	11/30/2021	10:44:49	D	6.50
4	JABALPUR	SAHPURA	S-NPP	23.18340	79.63050	11/30/2021	14:01:00	D	5.10
5	JABALPUR	SAHPURA	S-NPP	23.18380	79.63440	11/30/2021	14:01:00	D	5.60
6	JABALPUR	SAHPURA	S-NPP	23.18430	79.63040	11/30/2021	14:01:00	D	4.60
7	JABALPUR	SAHPURA	S-NPP	23.18460	79.63430	11/30/2021	14:01:00	D	5.70
8	MANDLA	MANDLA	TERRA	22.55500	80.47000	11/30/2021	10:44:49	D	5.00
9	NARSHIMAPURA	GADARWARA	S-NPP	22.86320	78.91650	11/30/2021	14:01:00	D	2.70
10	SEONI	GHANSAUR	S-NPP	22.63130	80.10840	11/30/2021	14:01:00	D	7.00
11	SEONI	SEONI	TERRA	22.21600	79.40600	11/30/2021	10:44:49	D	5.10
12	SEONI	SEONI	TERRA	22.31600	79.68100	11/30/2021	10:44:49	D	6.20
13	SHEOPUR	SHEOPUR	S-NPP	25.44250	76.60410	11/30/2021	14:01:00	D	6.50
14	SHEOPUR	SHEOPUR	S-NPP	25.44450	76.60150	11/30/2021	14:01:00	D	6.90

The study used data received from following Satellites at NRSC 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

The rice mask for the Punjab and Haryana were provided by MNCFC, MoA&FW, Govt of India
The kharif crop mask for Delhi, Uttar Pradesh, Rajasthan and Madhya Pradesh were provided by NRSC

Study Team

ICAR – HQ	Dr S.K. Chaudhari	DDG (AG. ENGG.)	ddgengg@icar.org.in
	Dr S. Bhasker	ADG (NRM)	adgagroandaf@gmail.com
	Dr K.K. Singh	ADG (AG. ENGG.)	kanchansingh044@gmail.com
ICAR - IARI	Dr V.K. Sehgal	Professor & Nodal Scientist	iaricreams@gmail.com
	Dr Rajkumar Dhakar	Scientist	raidhakar.iari@gmail.com
	Mr Mohd Jahangir	Lab Assistant (KRISHI)	mjahangir198@gmail.com
ICAR - ATARI	Dr Rajbir Singh	Director ATARI (Zone-I) Ludhiana	rajbirsingh.zpd@gmail.com
	Dr S.K. Singh	Director ATARI (Zone-II) Jodhpur	sushilsinghiipr@yahoo.co.in
	Dr Atar Singh	Director ATARI (Zone-III) Kanpur	zpdicarkanpur@gmail.com
ICAR - IASRI	Dr Rajender Parsad	Director	rajender.parsad@icar.gov.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)
