

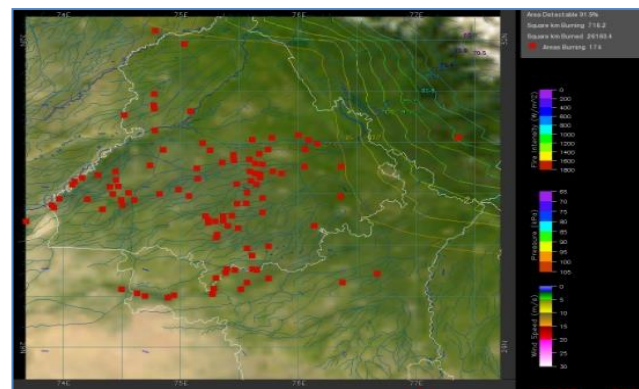
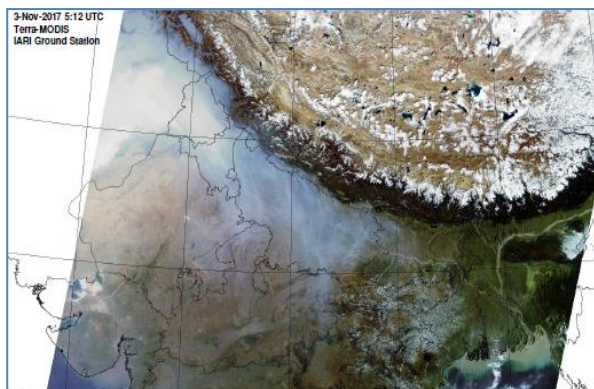


MONITORING WHEAT RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

**Bulletin
No. 53**

**Events Date:
23-May-2023**

**Issued on:
23-May-2023**



Prepared by:

**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
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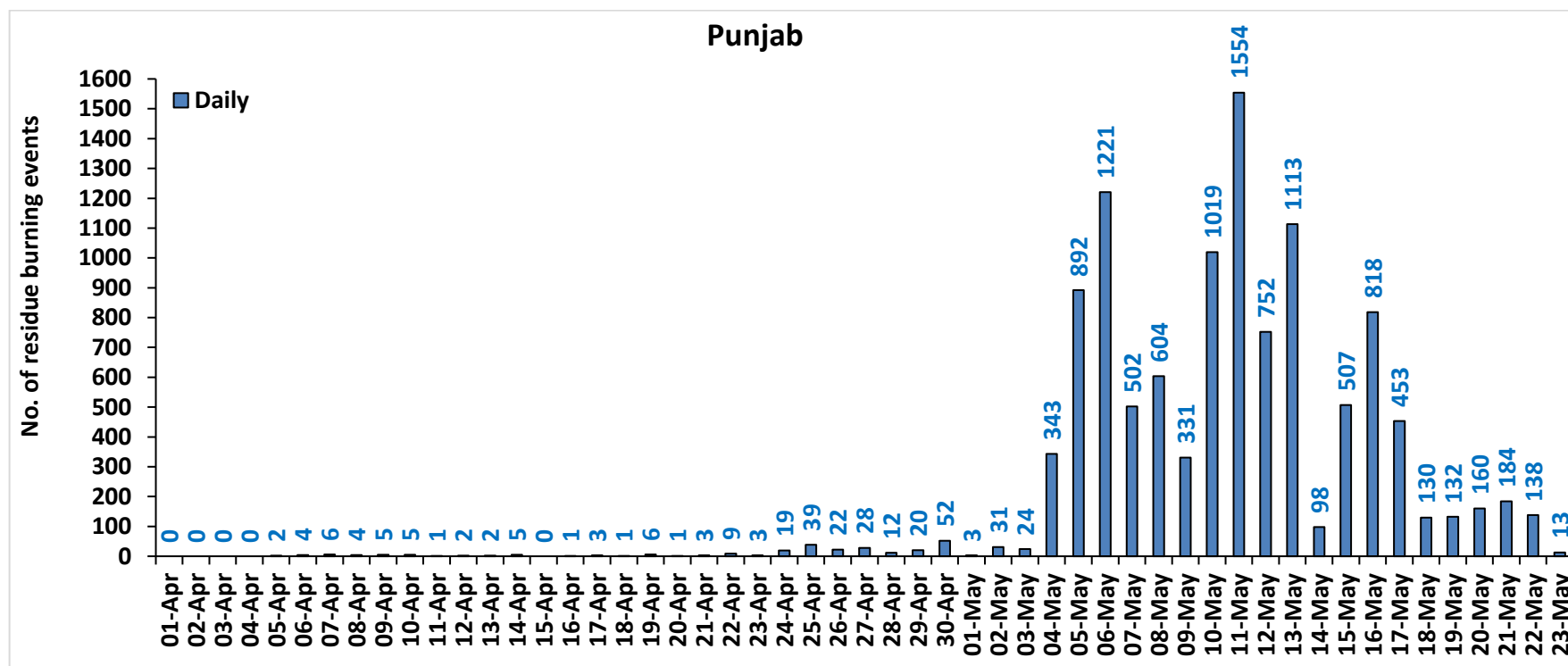
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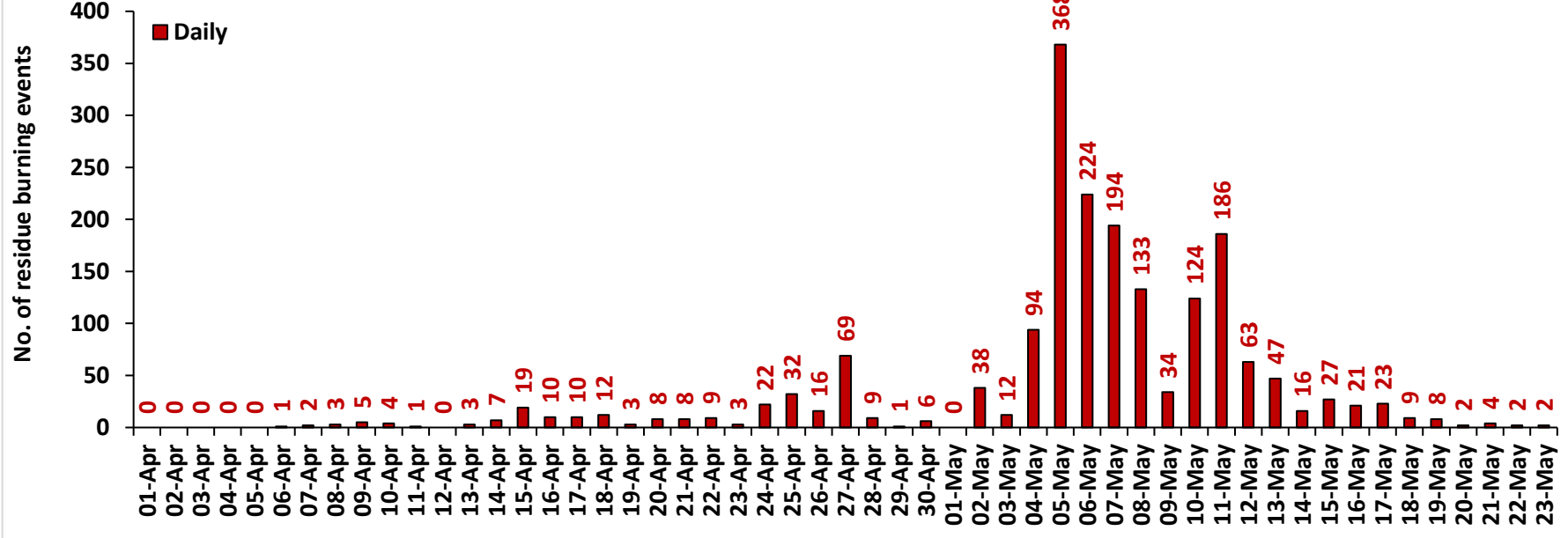
Highlights for 23-May-2023

- The active fire events due to wheat 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 **87** residue burning events in the five study States on 23-May-2023.
- The state wise events detected on 23-May-2023 were **13** in Punjab, **02** in Haryana, **00** in Delhi, **15** in Uttar Pradesh and **57** in Madhya Pradesh.
- The number of events has decreased from **215** on 22-May-2023 to **87** on 23-May-2023 in the five study states.
- Total **38260** burning events were detected in the five states between 01-Apr-2023 and 23-May-2023, which are distributed as **11277**, **1894**, **6387**, **05**, and **18697** in Punjab, Haryana, UP, Delhi, and MP, respectively.

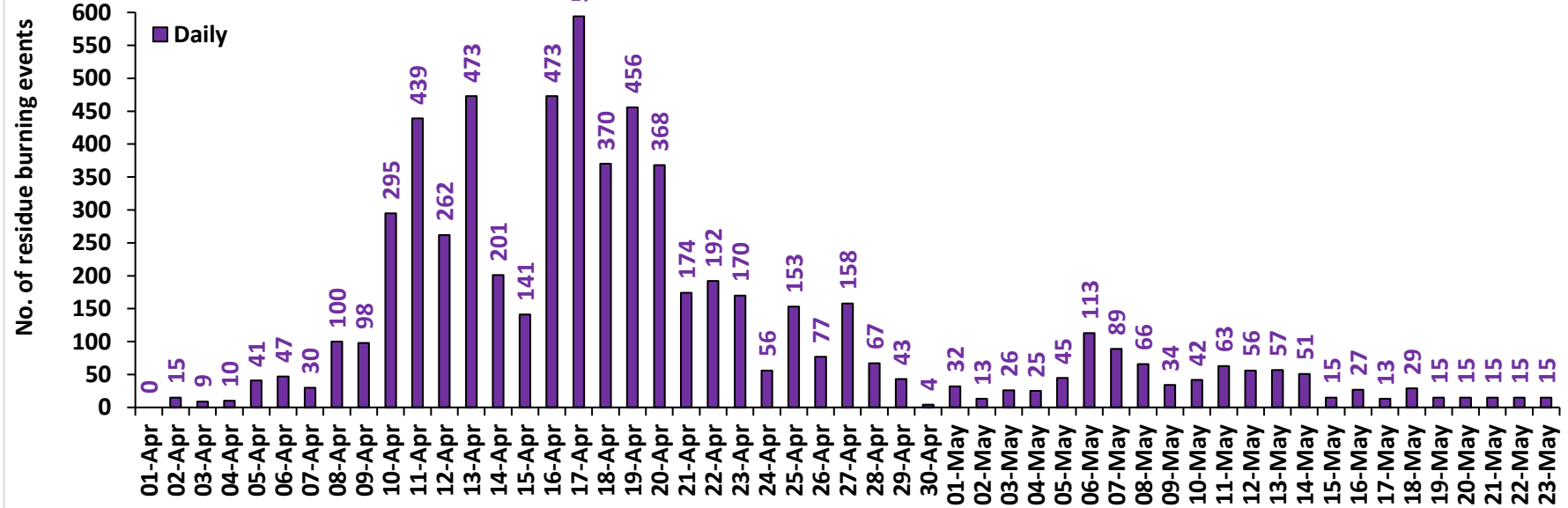
Temporal distribution of wheat residue burning events for the study States in 2023



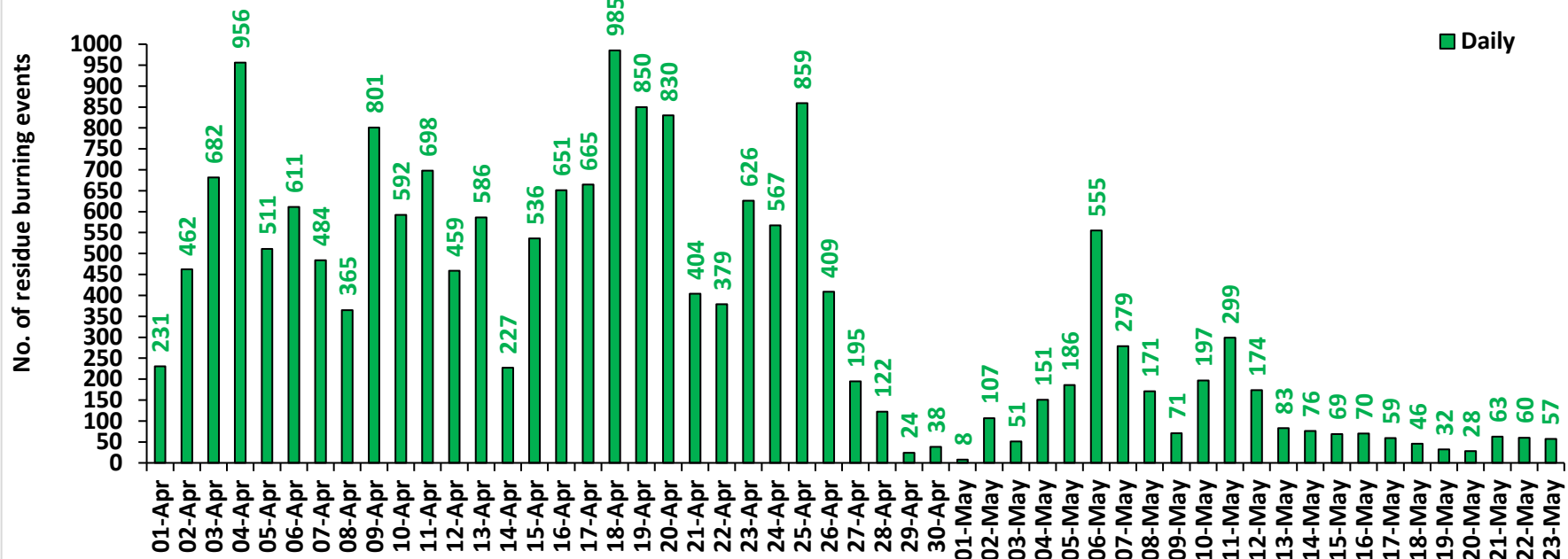
Haryana



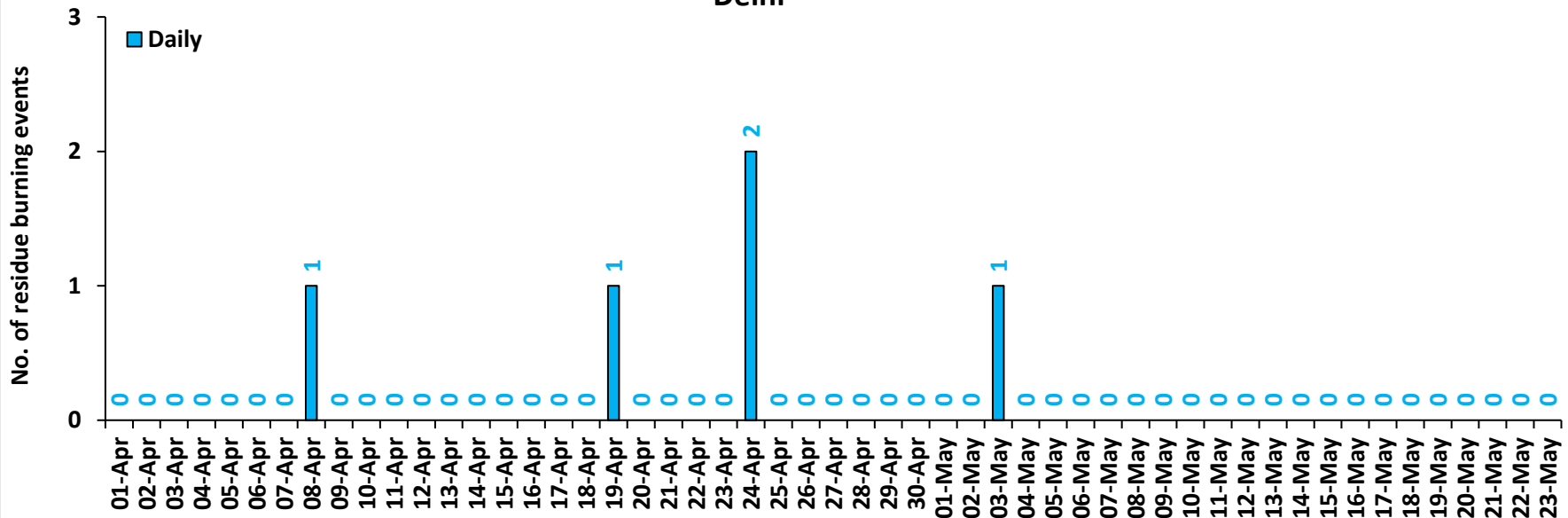
Uttar Pradesh



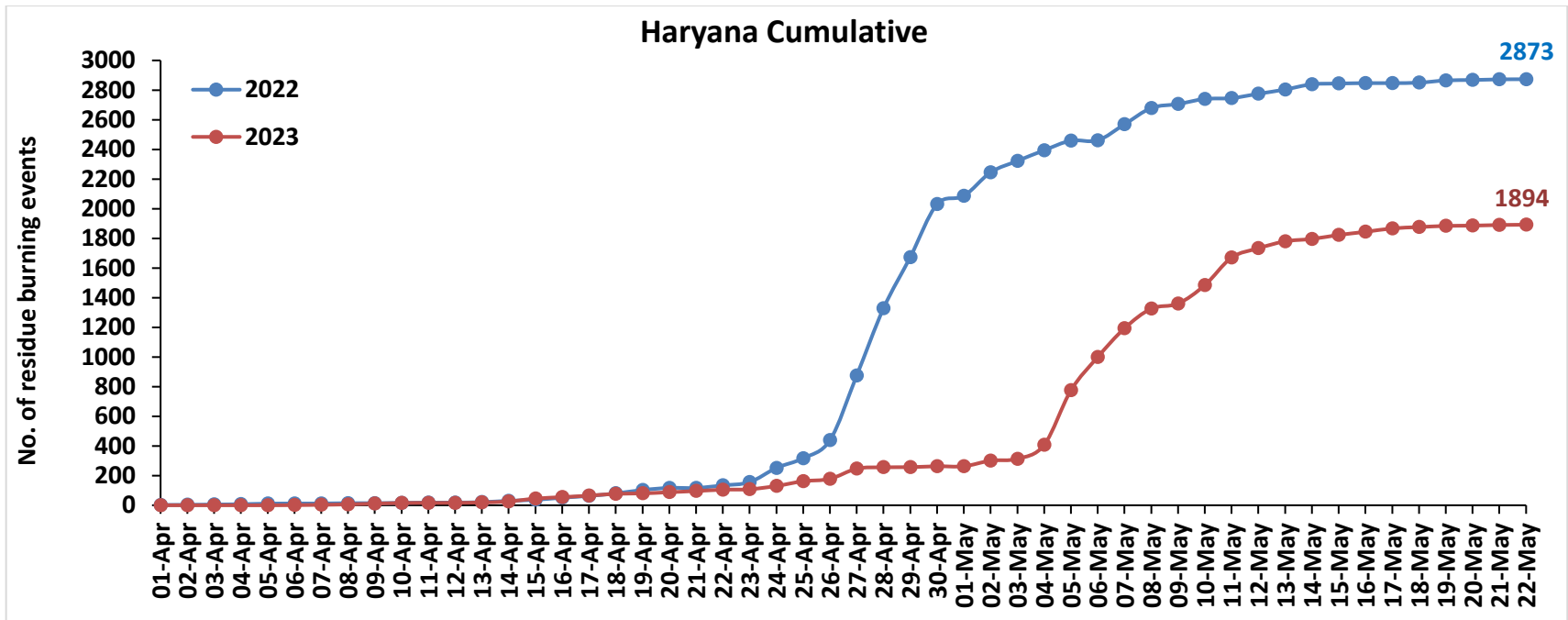
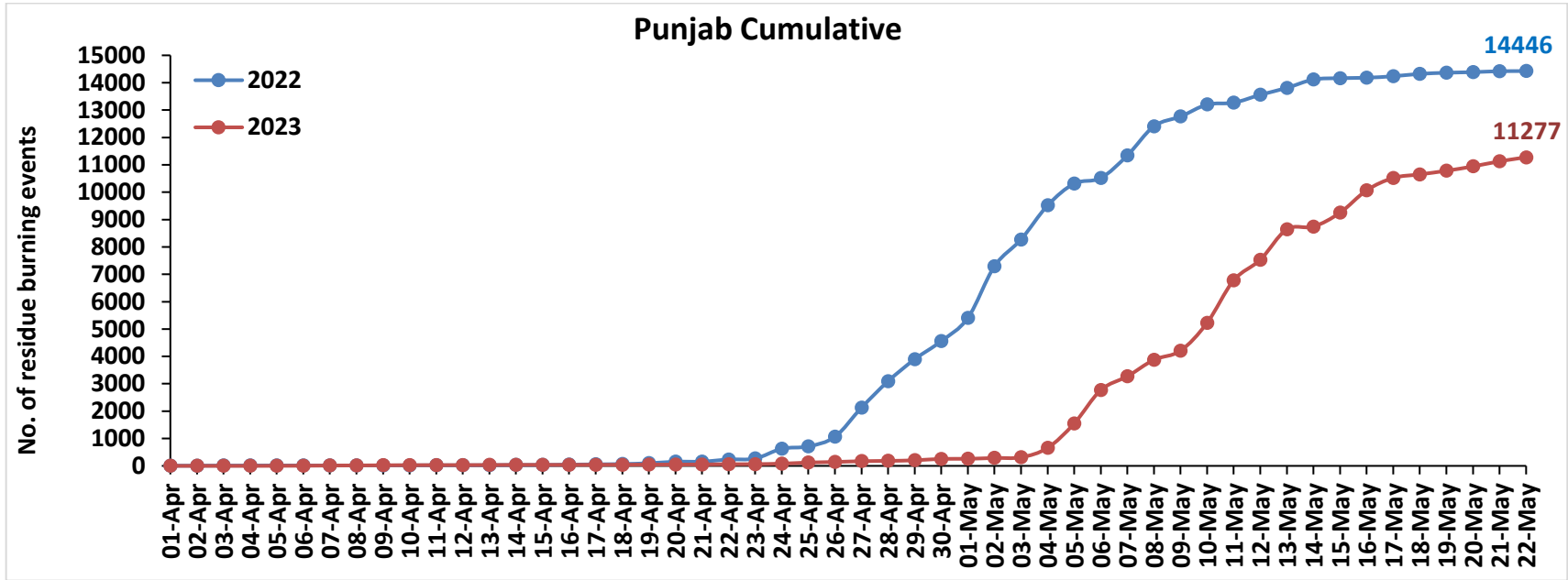
Madhya Pradesh

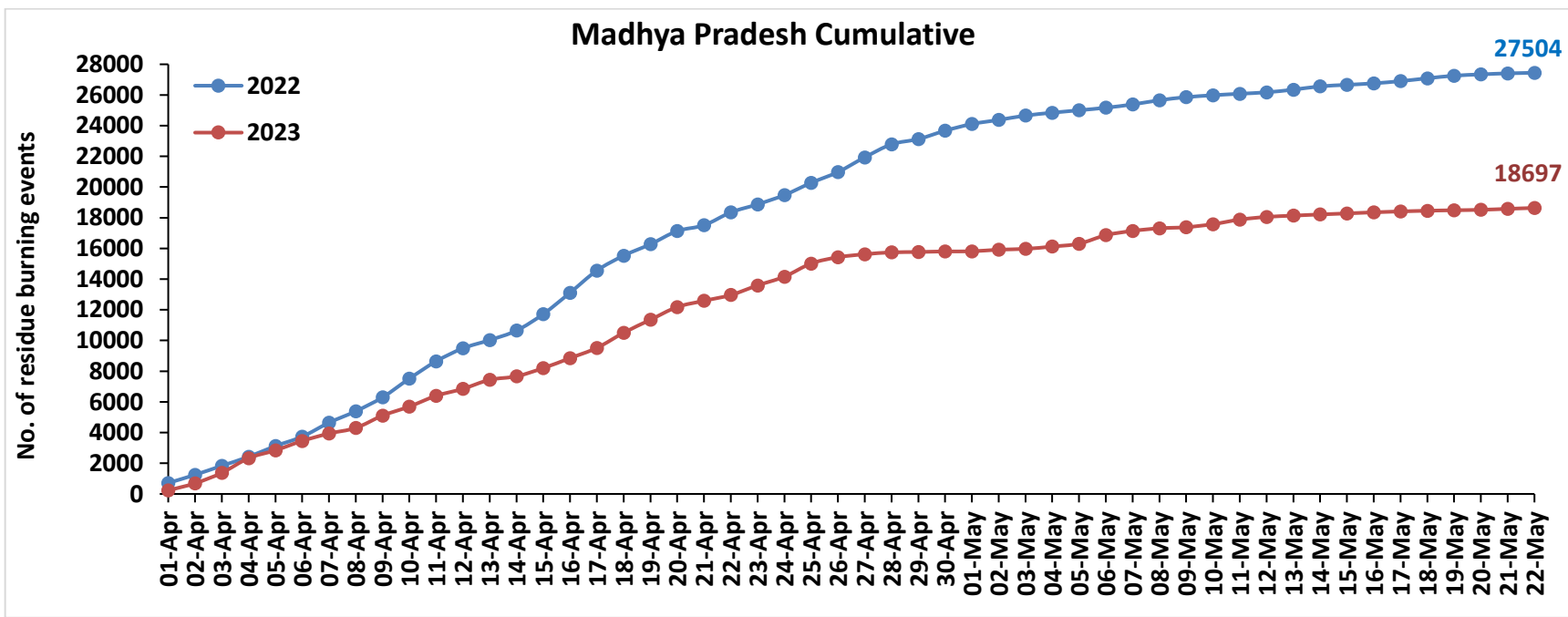
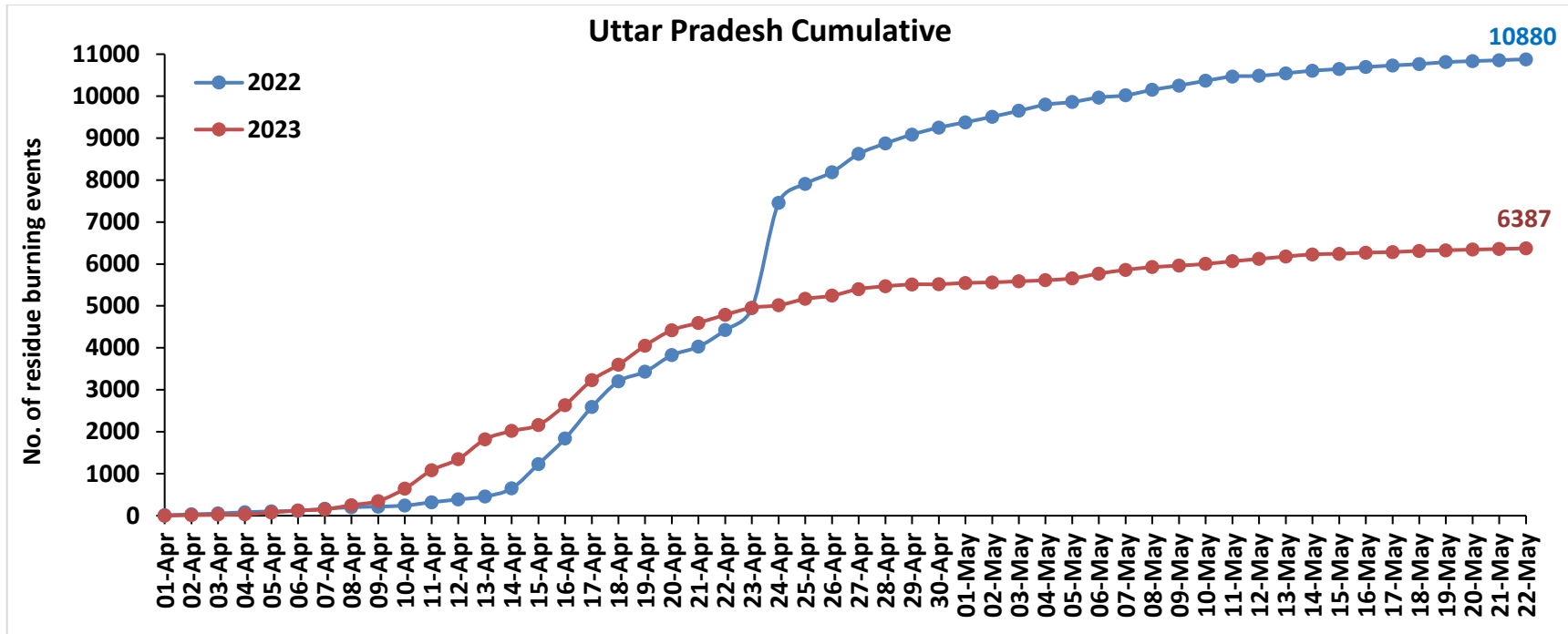


Delhi

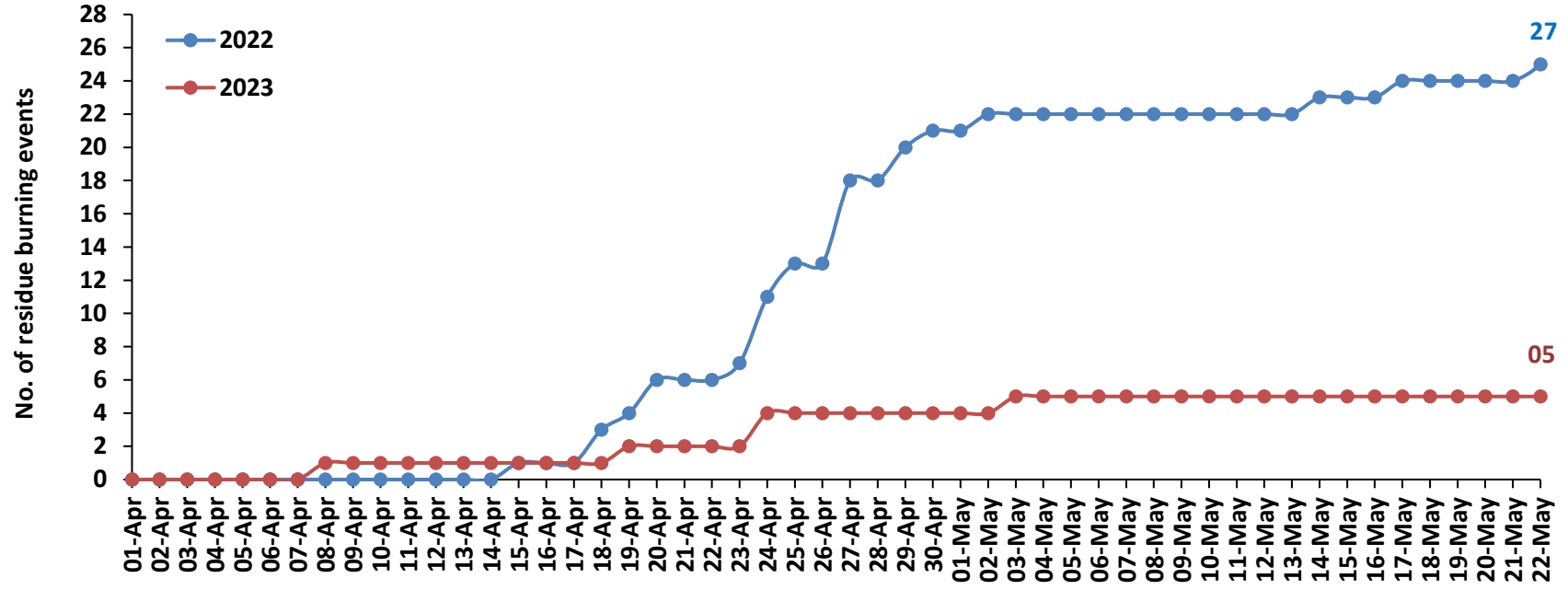


Comparison of residue burning events in current year (2023) with previous year (2022) for the study States





Delhi Cumulative



District-wise cumulative number of wheat residue burning events detected in 2022 and 2023
(Period: 01 April-23 May)

(a) Punjab

District	01 Apr-23 May	
	2022	2023
Amritsar	1236	865
Barnala	472	542
Bathinda	829	585
Faridkot	524	464
Fatehgarh Sahib	72	139
Fazilka	526	385
Firozpur	1426	899
Gurdaspur	1123	947
Hoshiarpur	479	407
Jalandhar	825	595
Kapurthala	724	499
Ludhiana	946	875
Mansa	412	332
Moga	1099	1010
Muktsar	728	587
Pathankot	167	91
Patiala	457	427
Rupnagar	74	40
Sangrur	1011	817
SAS NAGAR (Mohali)	27	11
SBS Nagar	220	175
Tarn Taran	1069	585
Total	14446	11277

(b) Haryana

District	01 Apr-23 May	
	2022	2023
AMBALA	93	82
BHIWANI	76	24
CHARKHI DADRI	10	8
FARIDABAD	17	16
FATEHABAD	274	268
GURGAON	7	9
HISAR	150	113
JHAJJAR	121	66
JIND	346	156
KAITHAL	306	190
KARNAL	382	227
KURUKSHETRA	140	57
MAHENDRAGARH	0	0
MEWAT	1	8
PALWAL	33	28
PANCHKULA	3	3
PANIPAT	218	110
REWARI	3	3
ROHTAK	211	94
SIRSA	186	259
SONIPAT	274	133
YAMUNANAGAR	22	40
Total	2873	1894

(c) Uttar Pradesh

District	01 Apr-23 May							
	2022	2023	GAUTAMBUDHNAGAR	29	24	MUZAFARNAGAR	55	33
			GAZIPUR	106	48	PILHIBHIT	326	65
AGRA	2	0	GHAZIABAD	13	10	PRATAPGARH	24	15
ALIGARH	19	33	GONDA	21	29	RAIBEARELI	102	17
ALLAHABAD	111	43	GORAKHPUR	975	368	RAMPUR	117	33
AMBEDKARNAGAR	11	13	HAMIRPUR	18	41	SANTKABIRNAGAR	691	430
AURAIYA	105	15	HARDOI	115	80	SANTRAVIDASNAGAR	1	3
AZAMGARH	90	76	JALAUN	26	21	SHAHJAHANPUR	347	101
BADAUN	9	8	JAUNPUR	22	8	SHARANPUR	32	21
BAGHPAT	7	3	JHANSI	108	142	SHRAWASTI	86	43
BAHRAICH	109	45	JYOTIBAPHULE NAGAR	9	5	SIDDHARTHANAGAR	2539	1852
BALLIA	153	205	KANNAUJ	0	1	SITAPUR	24	25
BALRAMPUR	244	97	KANPUR	13	4	SONBHADRA	129	42
BANDA	10	5	KANPUR DEHAT	32	25	SULTANPUR	60	30
BARABANKI	10	3	KAUSHAMBI	8	6	UNNAO	70	18
BAREILLY	114	22	KHERI	163	78	VARANASI	2	0
BASTI	428	226	KUSHINAGAR	224	95	Total	10880	6387
BIJNOR	54	28	LACKNOW	13	2			
BULANDSAHAR	8	11	LALITPUR	66	71			
CHANDAULI	292	62	MAHAMAYANAGAR	0	1			
CHITRAKOOT	24	3	MAHARAJGANJ	1495	977			
DEORIA	732	440	MAHOBA	6	44			
ETAH	2	7	MAINPURI	6	7			
ETAWAH	3	5	MATHURA	24	54			
FAIZABAD	7	12	MAU	87	64			
FARRUKHABAD	3	2	MEERUT	20	26			
FATEHPUR	47	35	MIRZAPUR	73	15			
FIROZABAD	1	0	MORADABAD	8	14			

(d) Madhya Pradesh

District	01 Apr-23 May				
	2022	2023			
			PANNA	181	75
ALIRAJPUR	0	0	RAISEN	2643	1672
ANUPPUR	35	2	RAJGARH	161	181
ASHOKNAGAR	646	231	RATLAM	200	292
BALAGHAT	29	1	REWA	193	73
BARWANI	7	7	SAGAR	777	585
BETUL	207	62	SATNA	1013	251
BHIND	73	70	SEHORE	950	655
BHOPAL	967	494	SEONI	1531	816
BURHANPUR	12	4	SHAHDOL	111	8
CHHATARPUR	165	175	SHAJAPUR	409	548
CHHINDWARA	530	267	SHEOPUR	377	452
DAMOH	219	255	SHIVPURI	197	121
DATIA	389	287	SIDHI	32	5
DEWAS	583	569	SINGRAULI	124	3
DHAR	1011	882	TIKAMGARH	42	84
DINDORI	45	5	UJJAIN	1247	1788
EAST NIMAR	83	108	UMARIA	62	15
GUNA	763	393	VIDESHA	3747	1746
GWALIOR	618	397	WEST NIMAR	40	73
HARDA	402	276	Total	27504	18697
HOSHANGABAD	4065	2757			
INDORE	971	1010			
JABALPUR	891	484			
JHABUA	2	6			
KATNI	307	146			
MANDLA	182	49			
MANDSAUR	68	112			
MORENA	47	60			
NARSHIMAPURA	129	103			
NIMACH	21	42			

(e) Delhi

District	01 Apr-23 May	
	2022	2023
CENTRAL	0	0
EAST	0	0
NEW DELHI	0	0
NORTH	22	2
NORTH EAST	1	0
NORTH WEST DELHI	1	0
SHAHADRA	0	0
SOUTH	1	0
SOUTH EAST	0	0
SOUTH WEST DELHI	1	2
WEST DELHI	1	1
Total	27	5

State-wise and date-wise number of wheat residue burning events detected in 2022 and 2023
(Period: 01 April-23 May)

Date	Punjab		Haryana		Uttar Pradesh		Delhi		Madhya Pradesh	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
01-Apr	6	0	2	0	10	0	0	0	715	231
02-Apr	1	0	1	0	22	15	0	0	531	462
03-Apr	3	0	2	0	21	9	0	0	589	682
04-Apr	2	0	2	0	29	10	0	0	589	956
05-Apr	2	2	4	0	21	41	0	0	698	511
06-Apr	0	4	1	1	16	47	0	0	612	611
07-Apr	0	6	0	2	46	30	0	0	908	484
08-Apr	1	4	2	3	37	100	0	1	749	365
09-Apr	0	5	0	5	16	98	0	0	907	801
10-Apr	4	5	2	4	24	295	0	0	1217	592
11-Apr	2	1	2	1	78	439	0	0	1129	698
12-Apr	0	2	0	0	67	262	0	0	847	459
13-Apr	3	2	3	3	70	473	0	0	537	586
14-Apr	7	5	9	7	193	201	0	0	618	227
15-Apr	1	0	7	19	579	141	1	0	1079	536
16-Apr	13	1	14	10	609	473	0	0	1390	651
17-Apr	10	3	12	10	751	594	0	0	1441	665
18-Apr	12	1	17	12	611	370	2	0	972	985
19-Apr	29	6	23	3	231	456	1	1	748	850
20-Apr	56	1	14	8	395	368	2	0	856	830
21-Apr	4	3	0	8	202	174	0	0	379	404
22-Apr	77	9	17	9	398	192	0	0	839	379
23-Apr	35	3	22	2	519	170	1	0	524	626
24-Apr	360	19	96	22	2515	56	4	2	605	567
25-Apr	82	39	65	32	450	153	2	0	796	859

26-Apr	354	22	122	16	277	77	0	0	706	409
27-Apr	1064	28	436	69	436	158	5	0	955	195
28-Apr	965	12	453	9	249	67	0	0	849	122
29-Apr	802	20	345	1	213	43	2	0	340	24
30-Apr	662	52	357	6	166	4	1	0	547	38
01-May	848	3	56	0	126	32	0	0	437	8
02-May	1887	31	159	38	132	13	1	0	265	107
03-May	979	24	77	12	141	26	0	1	283	51
04-May	1247	343	72	94	147	25	0	0	188	151
05-May	796	892	65	368	64	45	0	0	159	186
06-May	202	1221	2	224	107	113	0	0	166	555
07-May	827	502	108	194	52	89	0	0	215	279
08-May	1065	604	110	133	130	66	0	0	275	171
09-May	357	331	27	34	103	34	0	0	199	71
10-May	437	1019	34	124	113	42	0	0	123	197
11-May	67	1554	6	186	101	63	0	0	99	299
12-May	289	752	29	63	17	56	0	0	94	174
13-May	253	1113	29	47	60	57	0	0	173	83
14-May	306	98	35	16	63	51	1	0	214	76
15-May	49	507	5	27	38	15	0	0	99	69
16-May	16	818	3	21	49	27	0	0	98	70
17-May	55	453	0	23	37	13	1	0	143	59
18-May	85	130	3	9	34	29	0	0	187	46
19-May	42	132	15	8	46	15	0	0	167	32
20-May	22	160	3	2	24	15	0	0	86	28
21-May	35	184	4	4	21	15	0	0	69	63
22-May	5	138	1	2	21	15	1	0	35	60
23-May	20	13	0	2	3	15	2	0	58	57
Total	14446	11277	2873	1894	10880	6387	27	5	27504	18697

Details of residue burning events in Punjab on 23-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	ATTARI	S-NPP	31.58675	74.68967	13:55:24	D	3.80
2	BARNALA	MAHAL KALAN	S-NPP	30.49343	75.50619	13:55:24	D	2.70
3	BARNALA	MAHAL KALAN	S-NPP	30.49537	75.48392	13:55:24	D	5.90
4	BATHINDA	TALWANDI SABO	AQUA	29.90800	74.97000	03:14:38	N	31.50
5	FIROZPUR	MAKHU	S-NPP	31.14936	75.01756	13:55:24	D	4.00
6	GURDASPUR	DERA BABA NANAK	AQUA	32.04900	74.92200	14:07:15	D	32.50
7	RUPNAGAR	CHAMKAUR SAHIB	S-NPP	30.91464	76.34945	13:55:24	D	5.10
8	RUPNAGAR	CHAMKAUR SAHIB	S-NPP	30.93368	76.36201	13:55:24	D	4.10
9	SANGRUR	MALERKOTLA-1	S-NPP	30.61455	76.01877	13:55:24	D	5.40
10	SANGRUR	MALERKOTLA-1	S-NPP	30.61503	76.02343	13:55:24	D	5.40
11	SBS NAGAR	BALACHAUR	S-NPP	30.97824	76.45204	13:55:24	D	4.70
12	SBS NAGAR	BALACHAUR	S-NPP	31.03296	76.43227	02:45:25	N	1.30
13	TARN TARAN	VALTOHA	S-NPP	31.19944	74.68316	13:55:24	D	3.40

Details of residue burning events in Haryana on 23-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	BHIWANI	BHIWANI	S-NPP	28.79480	76.28432	13:55:24	D	8.70
2	CHARKHI DADRI	DADRI-II	S-NPP	28.56817	76.23821	13:55:24	D	11.70

Details of residue burning events in Uttar Pradesh on 23-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	ALLAHABAD	BARA	S-NPP	25.17933	81.67678	12:15:50	D	5.20
2	ALLAHABAD	KORAWN	S-NPP	24.95228	82.05914	13:55:24	D	4.40
3	ALLAHABAD	MEZA	S-NPP	25.09830	81.99436	01:05:07	N	0.40
4	ALLAHABAD	MEZA	S-NPP	25.10112	81.99487	01:05:07	N	2.60
5	AURAIYA	BIDHUNA	S-NPP	26.75382	79.42191	13:55:24	D	4.50
6	FATEHPUR	FATEHPUR	S-NPP	25.88390	80.74043	13:55:24	D	4.40
7	JAUNPUR	KIRAKAT	S-NPP	25.56174	82.78812	01:05:07	N	1.20
8	JAUNPUR	KIRAKAT	S-NPP	25.56260	82.79010	01:05:07	N	0.50
9	KANPUR DEHAT	SIKANDRA	S-NPP	26.39988	79.61385	13:55:24	D	7.00
10	KANPUR DEHAT	SIKANDRA	S-NPP	26.40019	79.61716	13:55:24	D	7.00
11	LACKNOW	BAKSHIKA TALAB	S-NPP	27.03388	80.86192	13:55:24	D	6.30
12	LACKNOW	BAKSHIKA TALAB	S-NPP	27.03463	80.86153	13:55:24	D	6.50
13	PILHIBHIT	PURANPUR	S-NPP	28.65316	80.21971	13:55:24	D	2.90
14	RAMPUR	RAMPUR	S-NPP	28.67383	79.06747	13:55:24	D	1.20
15	SHAHJAHANPUR	JALALABAD	S-NPP	27.72346	79.56761	13:55:24	D	3.40

Details of wheat residue burning events in Madhya Pradesh on 23-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	BETUL	BETUL	S-NPP	22.03987	77.65565	13:55:24	D	6.60
2	BETUL	MULTAI	S-NPP	21.84440	78.27941	13:55:24	D	8.80
3	BHOPAL	HUZUR	S-NPP	23.37984	77.41180	13:55:24	D	12.30
4	CHHATARPUR	BARAMALEHRA	S-NPP	24.50165	79.28459	13:55:24	D	9.60
5	CHHATARPUR	CHHATARPUR	S-NPP	24.77764	79.48225	13:55:24	D	11.90
6	CHHATARPUR	NOWGOAN	S-NPP	25.03747	79.82293	13:55:24	D	12.40
7	CHHATARPUR	RAJNAGAR	S-NPP	24.74443	79.68824	01:05:07	N	1.00
8	CHHATARPUR	RAJNAGAR	S-NPP	24.84237	79.89002	13:55:24	D	5.90
9	CHHATARPUR	RAJNAGAR	S-NPP	24.84523	79.88844	13:55:24	D	4.60
10	CHHATARPUR	RAJNAGAR	S-NPP	24.87679	79.83900	13:55:24	D	6.00
11	DEWAS	KHATEGOAN	S-NPP	22.59807	77.12228	13:55:24	D	16.60
12	KATNI	BAHURIBAND	S-NPP	23.59830	80.14015	13:55:24	D	4.10
13	KATNI	BAHURIBAND	S-NPP	23.70801	80.07395	13:55:24	D	4.50
14	KATNI	BAHURIBAND	S-NPP	23.71280	80.07015	13:55:24	D	5.90
15	KATNI	BIJERAGHOGARH	S-NPP	23.92943	80.82208	13:55:24	D	5.90
16	KATNI	BIJERAGHOGARH	S-NPP	24.10443	80.72114	01:05:07	N	1.20
17	MANDLA	MANDLA	S-NPP	22.56312	80.46466	13:55:24	D	3.40
18	MANDLA	MANDLA	S-NPP	22.56696	80.45103	13:55:24	D	4.20
19	MORENA	JORA	AQUA	26.35400	77.53400	14:07:15	D	22.40
20	MORENA	JORA	AQUA	26.35500	77.54800	14:07:15	D	15.70
21	MORENA	JORA	S-NPP	26.35283	77.53471	13:55:24	D	15.00
22	MORENA	JORA	S-NPP	26.36131	77.57349	13:55:24	D	17.10
23	MORENA	JORA	S-NPP	26.38544	77.67612	13:55:24	D	13.10
24	MORENA	KAILARAS	AQUA	26.31000	77.66500	14:07:15	D	18.90
25	MORENA	KAILARAS	AQUA	26.35100	77.54000	14:07:15	D	48.40
26	MORENA	KAILARAS	S-NPP	26.31846	77.66187	13:55:24	D	6.90
27	MORENA	KAILARAS	S-NPP	26.31898	77.66685	13:55:24	D	6.90
28	MORENA	KAILARAS	S-NPP	26.31950	77.67183	13:55:24	D	9.70
29	MORENA	KAILARAS	S-NPP	26.32030	77.66389	13:55:24	D	5.80
30	MORENA	KAILARAS	S-NPP	26.32128	77.67387	13:55:24	D	3.70

31	MORENA	KAILARAS	S-NPP	26.34786	77.53036	13:55:24	D	6.30
32	MORENA	KAILARAS	S-NPP	26.35332	77.53960	13:55:24	D	26.00
33	MORENA	KAILARAS	S-NPP	26.35383	77.54451	13:55:24	D	26.00
34	MORENA	SABALGARH	S-NPP	26.28348	77.50175	13:55:24	D	8.90
35	PANNA	PANNA	S-NPP	24.55668	80.27960	13:55:24	D	3.80
36	PANNA	PANNA	S-NPP	24.55717	80.28115	13:55:24	D	4.80
37	RAISEN	RAISEN	S-NPP	23.37605	77.89560	13:55:24	D	10.50
38	RAISEN	RAISEN	S-NPP	23.37605	77.89702	13:55:24	D	9.00
39	REWA	HUZUR	S-NPP	24.45415	81.37392	13:55:24	D	1.80
40	REWA	SIRMAUR	S-NPP	24.76500	81.22740	13:55:24	D	2.50
41	REWA	SIRMAUR	S-NPP	24.77674	81.37963	13:55:24	D	5.80
42	REWA	SIRMAUR	S-NPP	24.83142	81.10930	12:15:50	D	4.70
43	SAGAR	BANDA	S-NPP	24.28745	78.97066	13:55:24	D	6.10
44	SAGAR	BANDA	S-NPP	24.34305	79.04271	02:45:25	N	2.50
45	SAGAR	SAGAR	S-NPP	23.80596	78.56250	13:55:24	D	12.50
46	SATNA	AMARPATAN	S-NPP	24.34340	80.91464	13:55:24	D	10.90
47	SATNA	MAIHAR	S-NPP	24.29381	80.84455	13:55:24	D	7.50
48	SATNA	RAMPURBAGHLEAN	S-NPP	24.37578	80.97185	13:55:24	D	8.10
49	SATNA	RAMPURBAGHLEAN	S-NPP	24.52263	81.00462	13:55:24	D	6.10
50	SATNA	RAMPURBAGHLEAN	S-NPP	24.52404	81.00427	13:55:24	D	4.70
51	SATNA	RAMPURBAGHLEAN	S-NPP	24.75794	81.01481	13:55:24	D	6.70
52	SHEOPUR	SHEOPUR	S-NPP	25.80922	76.74731	13:55:24	D	12.60
53	SHEOPUR	SHEOPUR	S-NPP	25.80974	76.75079	13:55:24	D	13.30
54	SIDHI	CHORHAT	S-NPP	24.44020	81.64531	12:15:50	D	7.20
55	SIDHI	CHORHAT	S-NPP	24.44044	81.64642	12:15:50	D	5.00
56	VIDESHA	KORWAI	S-NPP	24.20400	78.07699	13:55:24	D	17.40
57	WEST NIMAR	MAHESHWAR	S-NPP	22.29618	75.74964	02:45:25	N	1.10

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

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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)
