

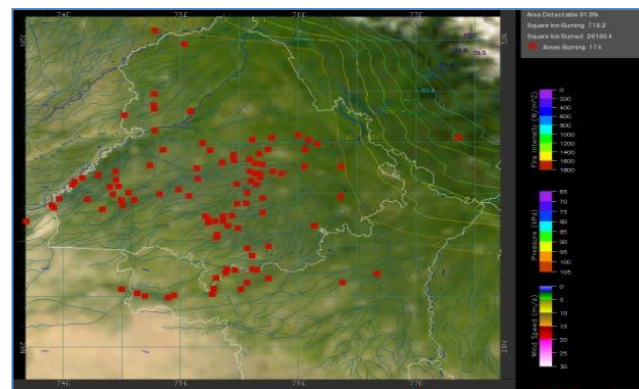
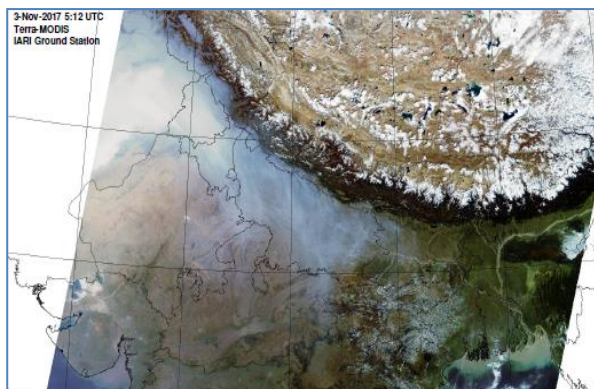


# MONITORING WHEAT RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

**Bulletin  
No. 50**

**Events Date:  
20-May-2023**

**Issued on:  
20-May-2023**



**Prepared by:**

**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,  
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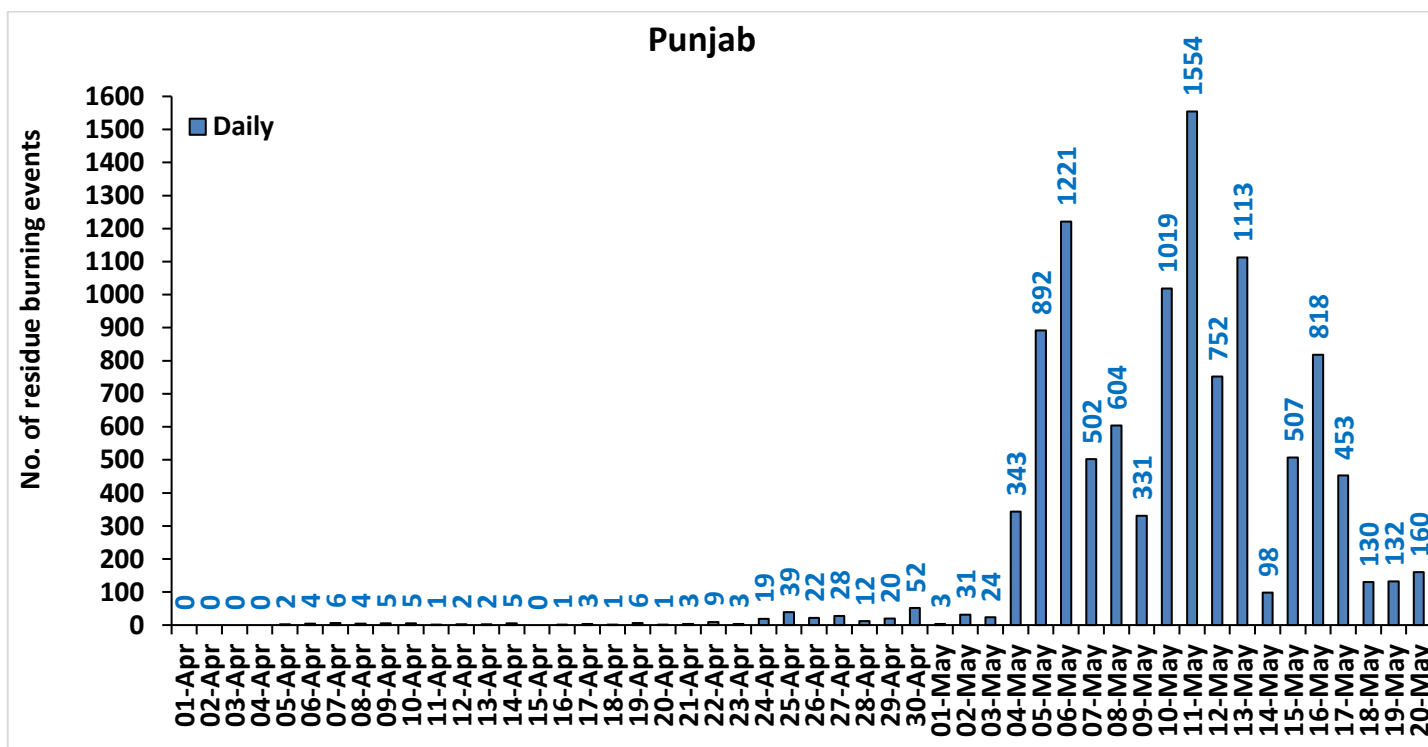
**<http://creams.iari.res.in/cms2/>**

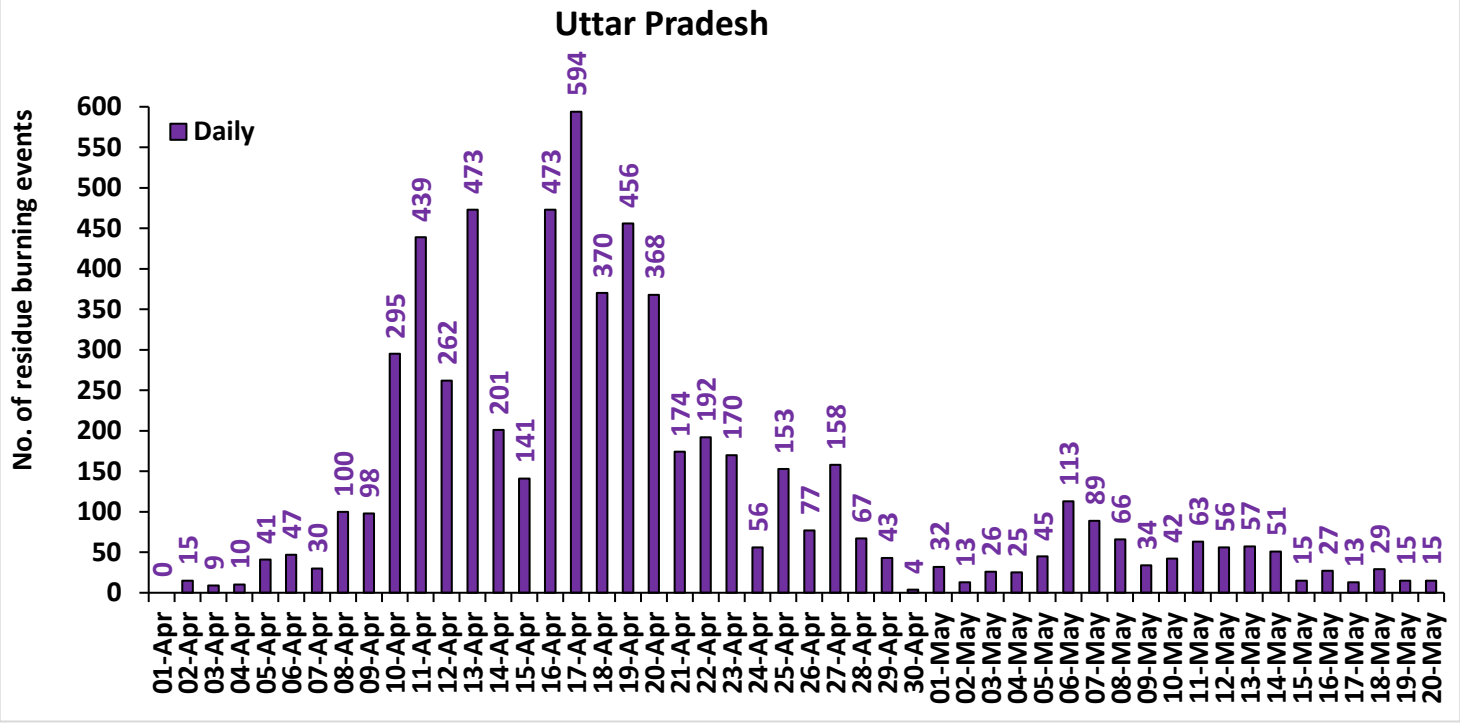
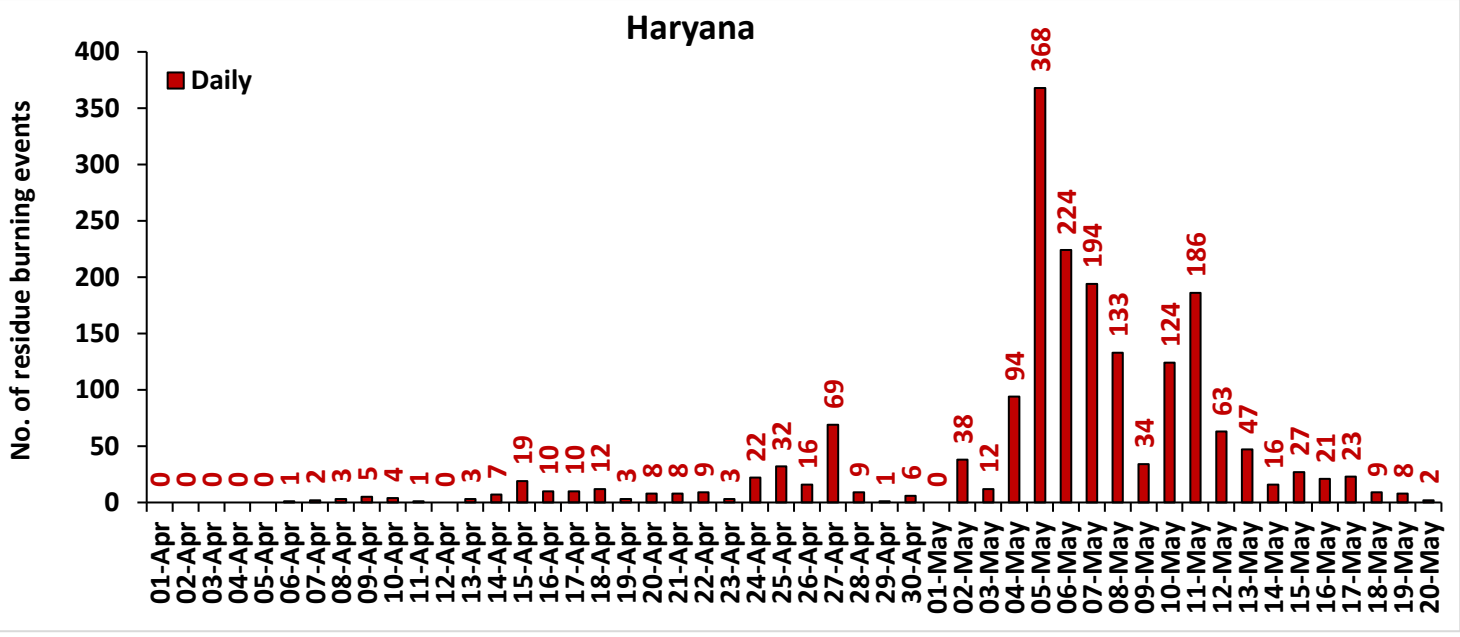


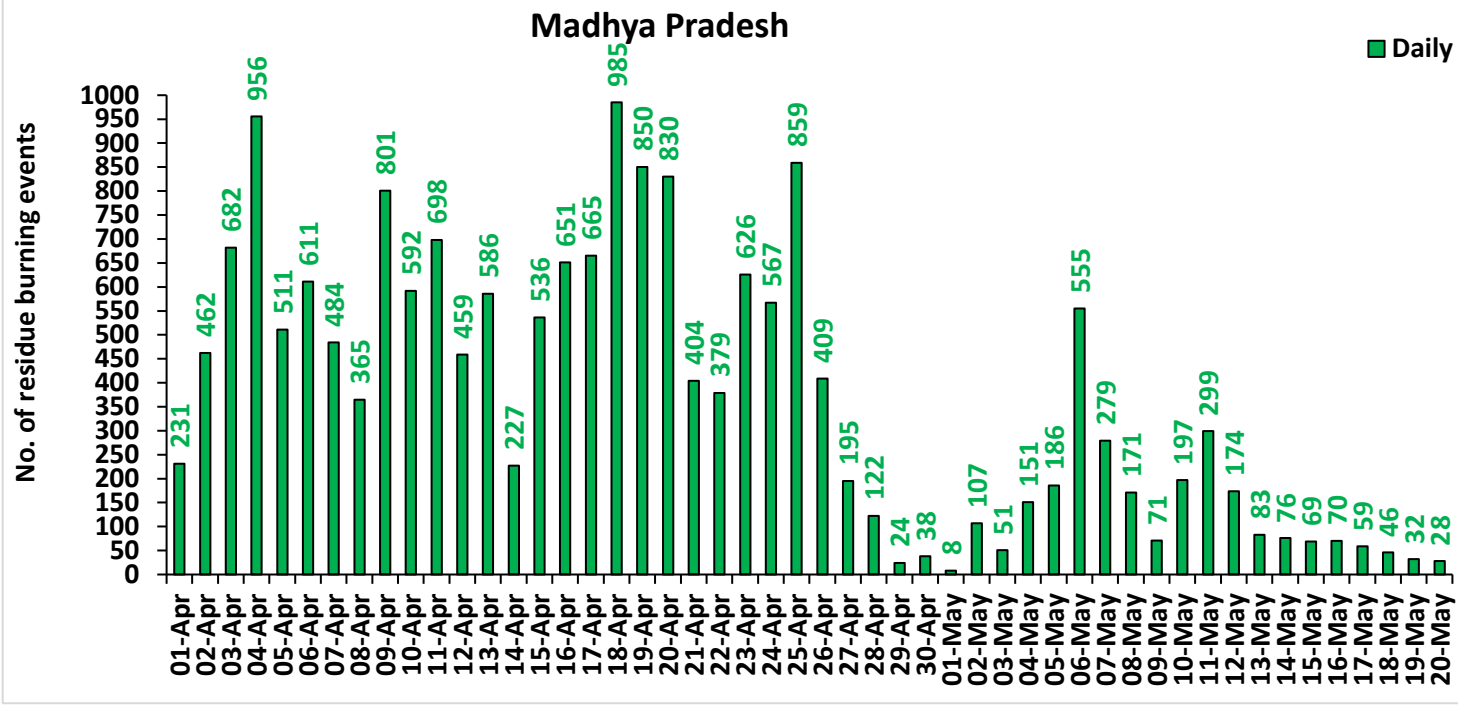
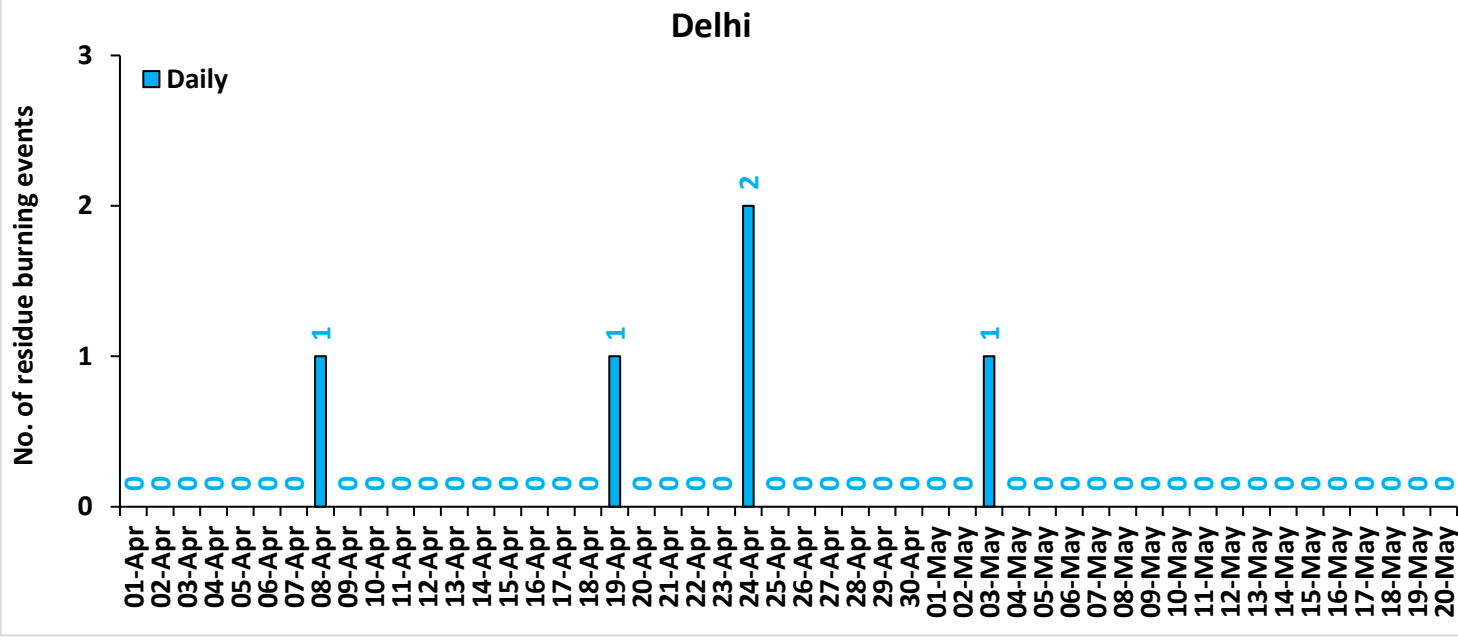
## Highlights for 20-May-2023

- 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 **205** residue burning events in the five study States on 20-May-2023.
- The state wise events detected on 20-May-2023 were **160** in Punjab, **02** in Haryana, **00** in Delhi, **15** in Uttar Pradesh and **28** in Madhya Pradesh.
- The number of events has increased from **187** on 19-May-2023 to **205** on 20-May-2023 in the five study states.
- Total **37692** burning events were detected in the five states between 01-Apr-2023 and 20-May-2023, which are distributed as **10942**, **1886**, **6342**, **05**, and **18517** in Punjab, Haryana, UP, Delhi, and MP, respectively.

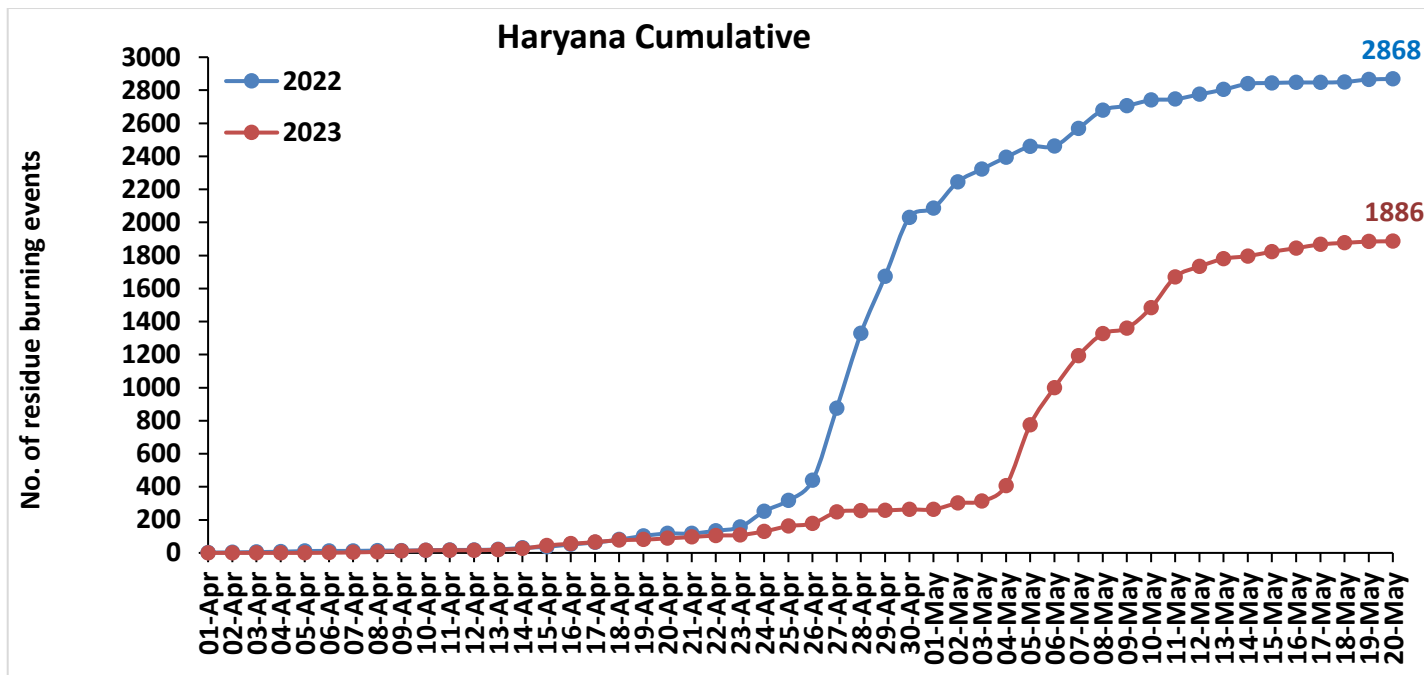
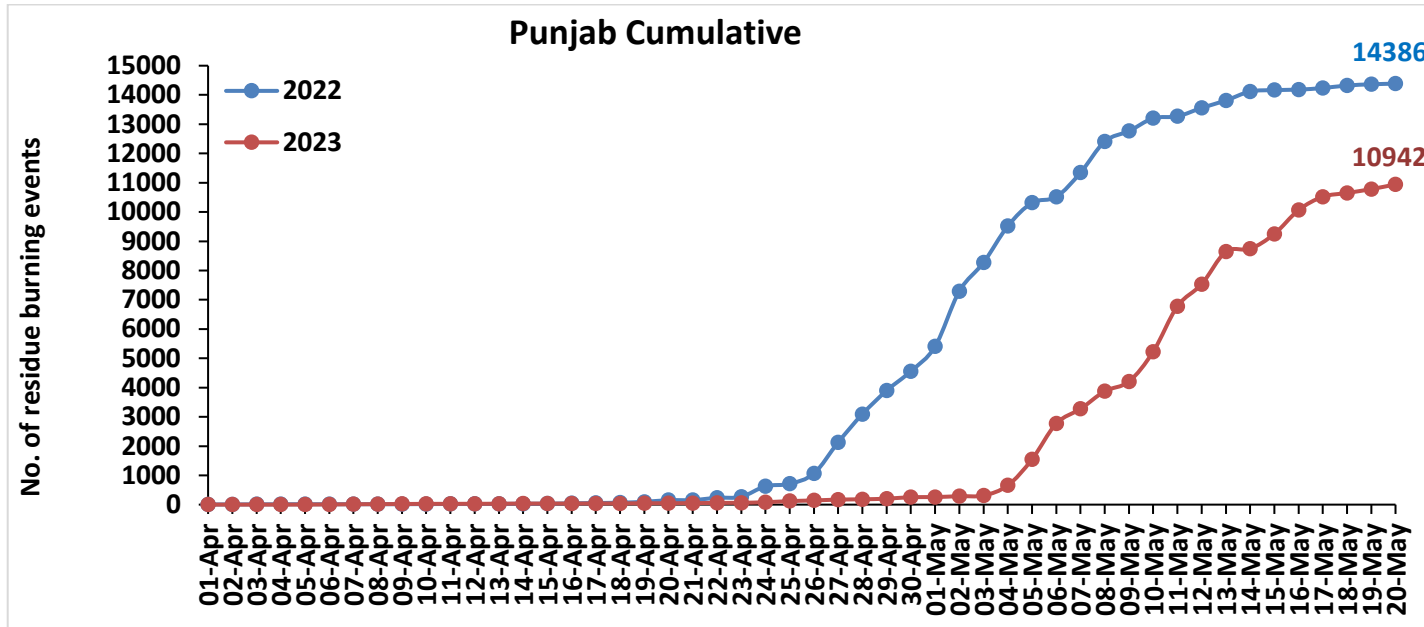
### Temporal distribution of wheat residue burning events for the study States in 2023



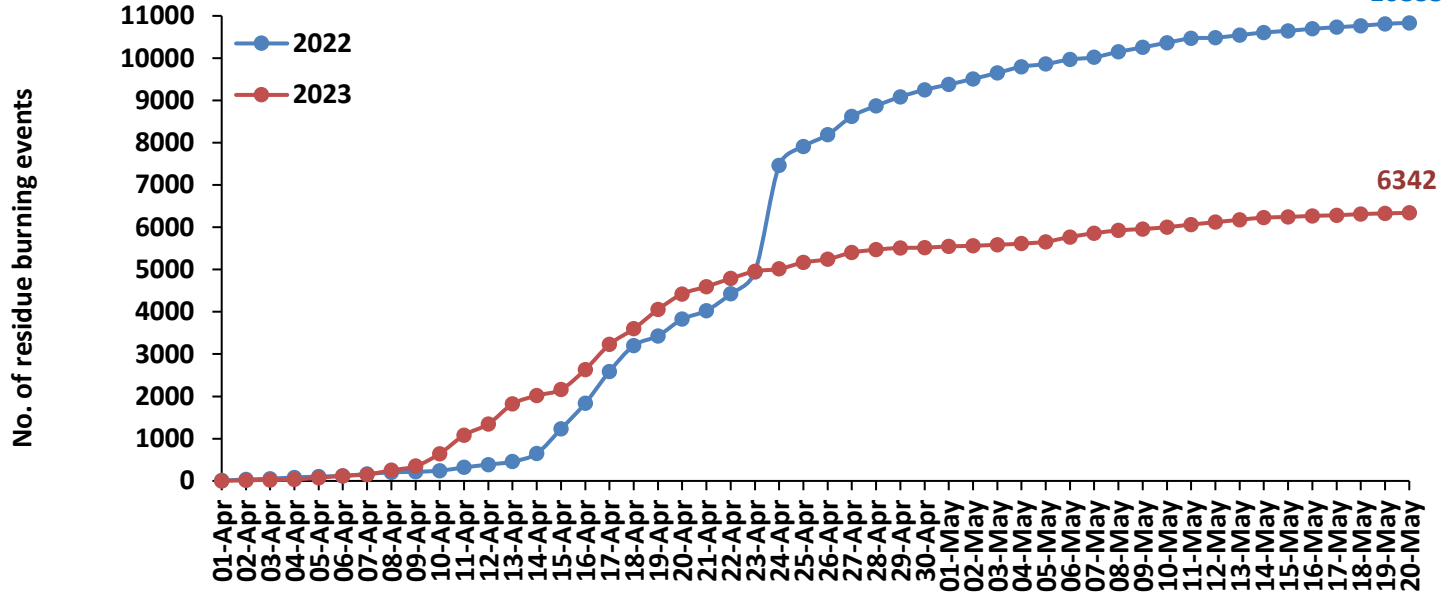




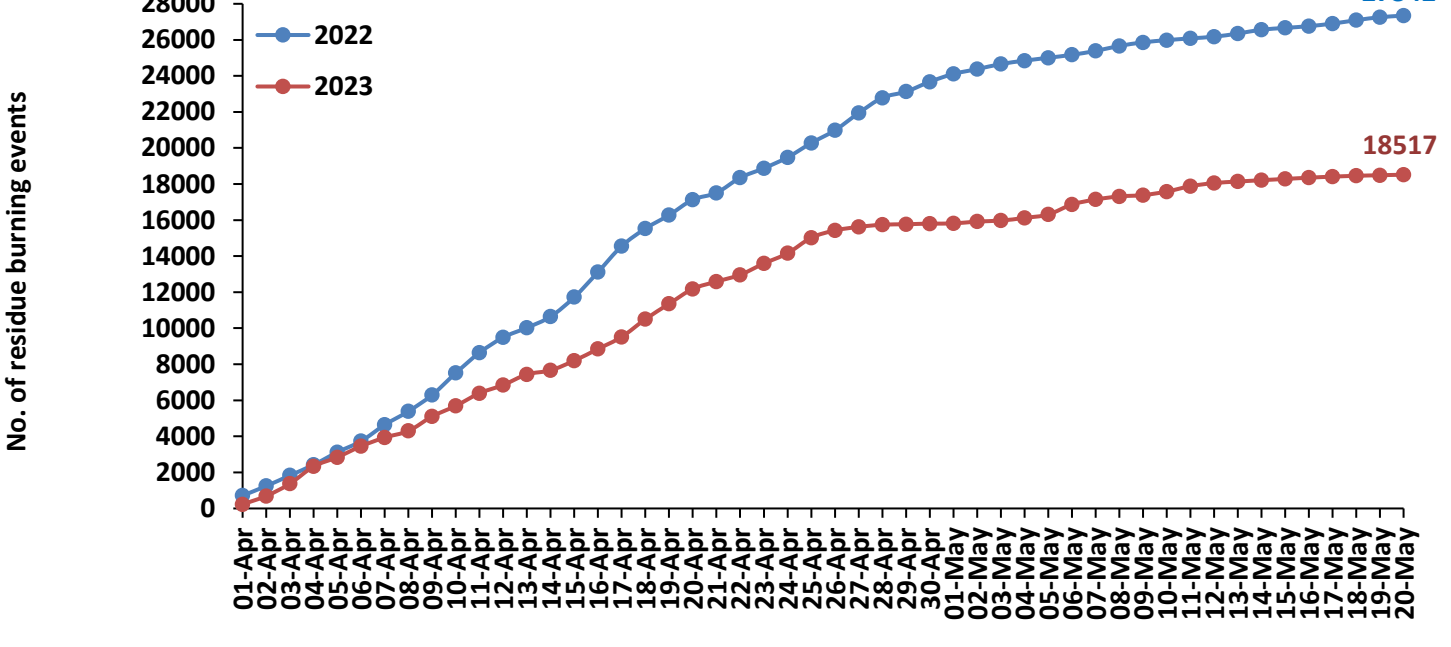
### Comparison of residue burning events in current year (2023) with previous year (2022) for the study States



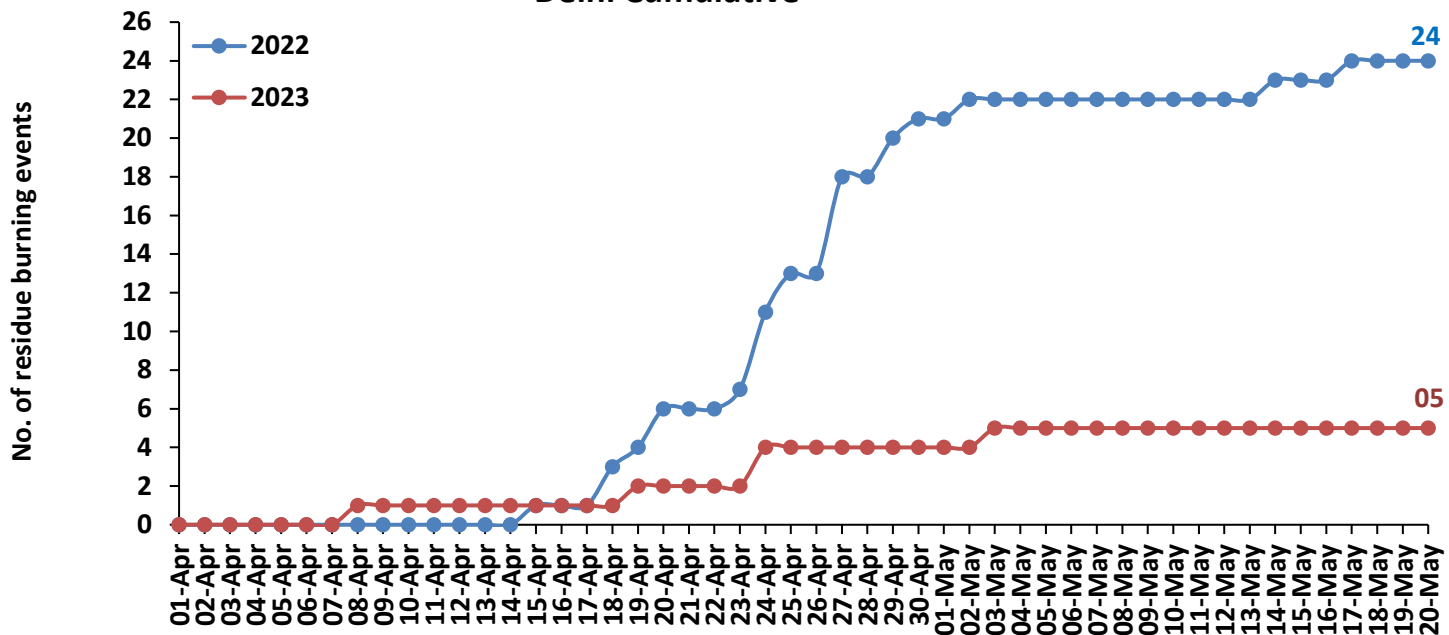
### Uttar Pradesh Cumulative



### Madhya Pradesh Cumulative



### Delhi Cumulative



**District-wise cumulative number of wheat residue burning events detected in 2022 and 2023**  
**(Period: 01 April-20 May)**

**(a) Punjab**

District	01 Apr-20 May	
	2022	2023
Amritsar	1233	852
Barnala	472	538
Bathinda	829	578
Faridkot	523	457
Fatehgarh Sahib	72	130
Fazilka	526	381
Firozpur	1422	873
Gurdaspur	1120	939
Hoshiarpur	476	401
Jalandhar	818	527
Kapurthala	715	474
Ludhiana	941	833
Mansa	412	330
Moga	1096	994
Muktsar	725	572
Pathankot	165	87
Patiala	453	421
Rupnagar	74	27
Sangrur	1009	810
SAS NAGAR (Mohali)	26	11
SBS Nagar	216	141
Tarn Taran	1063	566
<b>Total</b>	<b>14386</b>	<b>10942</b>

**(b) Haryana**

District	01 Apr-20 May	
	2022	2023
AMBALA	92	81
BHIWANI	76	23
CHARKHI DADRI	10	7
FARIDABAD	17	16
FATEHABAD	274	268
GURGAON	7	9
HISAR	150	112
JHAJJAR	121	66
JIND	346	156
KAITHAL	305	189
KARNAL	382	227
KURUKSHETRA	138	57
MAHENDRAGARH	0	0
MEWAT	1	8
PALWAL	33	28
PANCHKULA	3	2
PANIPAT	217	109
REWARI	3	3
ROHTAK	211	94
SIRSA	186	258
SONIPAT	274	133
YAMUNANAGAR	22	40
<b>Total</b>	<b>2868</b>	<b>1886</b>



(c) Uttar Pradesh

District	01 Apr-20 May							
	2022	2023						
			GAUTAMBUDHNAGAR	29	24	MUZAFARNAGAR	54	33
			GAZIPUR	104	48	PILHIBHIT	326	64
AGRA	2	0	GHAZIABAD	13	10	PRATAPGARH	24	15
ALIGARH	19	33	GONDA	21	28	RAIBEARELI	99	17
ALLAHABAD	110	39	GORAKHPUR	972	368	RAMPUR	117	32
AMBEDKARNAGAR	11	13	HAMIRPUR	18	40	SANTKABIRNAGAR	691	430
AURAIYA	103	14	HARDOI	112	78	SANTRAVIDASNAGAR	1	2
AZAMGARH	88	76	JALAUN	26	19	SHAHJAHANPUR	345	100
BADAUN	9	8	JAUNPUR	22	6	SHARANPUR	32	21
BAGHPAT	7	3	JHANSI	106	141	SHRAWASTI	86	43
BAHRAICH	107	44	JYOTIBAPHULE NAGAR	9	5	SIDDHARTHANAGAR	2538	1852
BALLIA	150	205	KANNAUJ	0	1	SITAPUR	23	24
BALRAMPUR	243	97	KANPUR	12	3	SONBHADRA	126	40
BANDA	10	4	KANPUR DEHAT	32	22	SULTANPUR	60	30
BARABANKI	8	3	KAUSHAMBI	8	5	UNNAO	68	18
BAREILLY	113	20	KHERI	162	77	VARANASI	1	0
BASTI	428	226	KUSHINAGAR	224	95	<b>Total</b>	<b>10835</b>	<b>6342</b>
BIJNOR	54	27	LACKNOW	13	0			
BULANDSAHAR	8	11	LALITPUR	66	66			
CHANDAULI	292	62	MAHAMAYANAGAR	0	1			
CHITRAKOOT	24	3	MAHARAJGANJ	1495	977			
DEORIA	732	440	MAHOBA	6	44			
ETAH	2	6	MAINPURI	6	6			
ETAWAH	3	5	MATHURA	24	53			
FAIZABAD	6	12	MAU	86	64			
FARRUKHABAD	3	2	MEERUT	20	25			
FATEHPUR	46	33	MIRZAPUR	71	15			
FIROZABAD	1	0	MORADABAD	8	14			

(d) Madhya Pradesh

District	01 Apr-20 May				
	2022	2023			
			PANNA	177	73
ALIRAJPUR	0	0	RAISEN	2636	1670
ANUPPUR	35	2	RAJGARH	158	180
ASHOKNAGAR	643	231	RATLAM	197	292
BALAGHAT	28	1	REWA	187	63
BARWANI	7	7	SAGAR	771	577
BETUL	202	60	SATNA	999	234
BHIND	73	57	SEHORE	946	654
BHOPAL	965	492	SEONI	1529	814
BURHANPUR	12	4	SHAHDOL	110	8
CHHATARPUR	162	158	SHAJAPUR	407	546
CHHINDWARA	520	267	SHEOPUR	375	449
DAMOH	219	254	SHIVPURI	193	121
DATIA	388	286	SIDHI	29	3
DEWAS	574	567	SINGRAULI	122	3
DHAR	1009	880	TIKAMGARH	39	82
DINDORI	45	5	UJJAIN	1241	1786
EAST NIMAR	82	107	UMARIA	61	12
GUNA	759	392	VIDESHA	3737	1745
GWALIOR	601	397	WEST NIMAR	40	62
HARDA	391	275	<b>Total</b>	<b>27342</b>	<b>18517</b>
HOSHANGABAD	4064	2757			
INDORE	971	1010			
JABALPUR	886	483			
JHABUA	2	6			
KATNI	307	135			
MANDLA	181	45			
MANDSAUR	66	112			
MORENA	46	12			
NARSHIMAPURA	129	100			
NIMACH	21	41			

(e) Delhi

District	01 Apr-20 May	
	2022	2023
CENTRAL	0	0
EAST	0	0
NEW DELHI	0	0
NORTH	19	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
<b>Total</b>	<b>24</b>	<b>5</b>

**State-wise and date-wise number of wheat residue burning events detected in 2022 and 2023**  
**(Period: 01 April-20 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

<b>26-Apr</b>	354	22	122	16	277	77	0	0	706	409
<b>27-Apr</b>	1064	28	436	69	436	158	5	0	955	195
<b>28-Apr</b>	965	12	453	9	249	67	0	0	849	122
<b>29-Apr</b>	802	20	345	1	213	43	2	0	340	24
<b>30-Apr</b>	662	52	357	6	166	4	1	0	547	38
<b>01-May</b>	848	3	56	0	126	32	0	0	437	8
<b>02-May</b>	1887	31	159	38	132	13	1	0	265	107
<b>03-May</b>	979	24	77	12	141	26	0	1	283	51
<b>04-May</b>	1247	343	72	94	147	25	0	0	188	151
<b>05-May</b>	796	892	65	368	64	45	0	0	159	186
<b>06-May</b>	202	1221	2	224	107	113	0	0	166	555
<b>07-May</b>	827	502	108	194	52	89	0	0	215	279
<b>08-May</b>	1065	604	110	133	130	66	0	0	275	171
<b>09-May</b>	357	331	27	34	103	34	0	0	199	71
<b>10-May</b>	437	1019	34	124	113	42	0	0	123	197
<b>11-May</b>	67	1554	6	186	101	63	0	0	99	299
<b>12-May</b>	289	752	29	63	17	56	0	0	94	174
<b>13-May</b>	253	1113	29	47	60	57	0	0	173	83
<b>14-May</b>	306	98	35	16	63	51	1	0	214	76
<b>15-May</b>	49	507	5	27	38	15	0	0	99	69
<b>16-May</b>	16	818	3	21	49	27	0	0	98	70
<b>17-May</b>	55	453	0	23	37	13	1	0	143	59
<b>18-May</b>	85	130	3	9	34	29	0	0	187	46
<b>19-May</b>	42	132	15	8	46	15	0	0	167	32
<b>20-May</b>	22	160	3	2	24	15	0	0	86	28
<b>Total</b>	<b>14386</b>	<b>10942</b>	<b>2868</b>	<b>1886</b>	<b>10835</b>	<b>6342</b>	<b>24</b>	<b>5</b>	<b>27342</b>	<b>18517</b>

### Details of residue burning events in Punjab on 20-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	AMRITSAR	AJNALA	S-NPP	31.84285	74.79522	13:11:53	D	14.80
2	AMRITSAR	AJNALA	S-NPP	31.88178	74.82417	13:11:53	D	12.60
3	AMRITSAR	AJNALA	S-NPP	31.88294	74.87084	13:11:53	D	6.70
4	AMRITSAR	AJNALA	S-NPP	31.99778	74.91950	13:11:53	D	5.80
5	AMRITSAR	AJNALA	S-NPP	32.00157	74.91850	13:11:53	D	5.80
6	AMRITSAR	AJNALA	AQUA	31.83800	74.79900	13:39:32	D	14.40
7	AMRITSAR	AJNALA	AQUA	31.89400	74.70900	13:39:32	D	17.30
8	AMRITSAR	ATTARI	S-NPP	31.51324	74.60388	13:11:53	D	7.10
9	AMRITSAR	ATTARI	S-NPP	31.54880	74.90843	13:11:53	D	12.10
10	AMRITSAR	ATTARI	S-NPP	31.54891	74.90609	13:11:53	D	11.40
11	AMRITSAR	CHOGAWAN	S-NPP	31.83028	74.70934	13:11:53	D	7.20
12	AMRITSAR	CHOGAWAN	S-NPP	31.83463	74.60589	13:11:53	D	7.20
13	AMRITSAR	MAJITHA	S-NPP	31.70748	75.07257	13:11:53	D	35.70
14	AMRITSAR	RAYYA	S-NPP	31.54522	75.22171	13:11:53	D	14.80
15	AMRITSAR	RAYYA	S-NPP	31.60172	75.26930	13:11:53	D	6.20
16	AMRITSAR	RAYYA	S-NPP	31.64822	75.27156	13:11:53	D	6.80
17	AMRITSAR	RAYYA	AQUA	31.59900	75.27000	13:39:32	D	16.00
18	AMRITSAR	TARSIKKA	S-NPP	31.63067	75.13989	13:11:53	D	7.50
19	BATHINDA	SANGAT	S-NPP	30.05029	74.74764	13:11:53	D	4.70
20	BATHINDA	TALWANDI SABO	AQUA	29.90800	74.96200	02:47:01	N	6.90
21	FARIDKOT	KOT KAPURA	S-NPP	30.63751	74.88865	13:11:53	D	8.00
22	FARIDKOT	KOT KAPURA	AQUA	30.64800	74.90800	13:39:32	D	10.70
23	FARIDKOT	KOT KAPURA	AQUA	30.65100	74.91400	13:39:32	D	27.10
24	FAZILKA	ABOHAR	S-NPP	30.21159	74.35228	13:11:53	D	4.10
25	FIROZPUR	FIROZPUR	S-NPP	30.92444	74.55495	13:11:53	D	6.10
26	FIROZPUR	GHALL KHURD	S-NPP	30.89290	74.68842	13:11:53	D	8.40
27	FIROZPUR	GURUHAR SAHAI	S-NPP	30.75248	74.36366	13:11:53	D	2.80
28	FIROZPUR	GURUHAR SAHAI	S-NPP	30.77157	74.27272	13:11:53	D	6.40
29	FIROZPUR	GURUHAR SAHAI	S-NPP	30.77223	74.27206	13:11:53	D	4.30

30	FIROZPUR	GURUHAR SAHAI	S-NPP	30.77305	74.27618	13:11:53	D	5.10
31	FIROZPUR	GURUHAR SAHAI	S-NPP	30.78395	74.31264	13:11:53	D	8.50
32	FIROZPUR	GURUHAR SAHAI	S-NPP	30.78436	74.31209	13:11:53	D	3.60
33	FIROZPUR	MAKHU	S-NPP	31.04413	74.87735	13:11:53	D	5.00
34	FIROZPUR	MAKHU	AQUA	31.06800	74.82400	13:39:32	D	40.50
35	FIROZPUR	MAMDOT	S-NPP	30.83820	74.45614	13:11:53	D	4.30
36	FIROZPUR	MAMDOT	S-NPP	30.90958	74.47931	13:11:53	D	10.20
37	FIROZPUR	ZIRA	S-NPP	31.00767	75.06699	13:11:53	D	12.60
38	FIROZPUR	ZIRA	AQUA	30.97100	75.03700	13:39:32	D	13.70
39	FIROZPUR	ZIRA	AQUA	30.98100	74.97900	13:39:32	D	26.10
40	GURDASPUR	DHARIWAL	AQUA	31.86000	75.28100	13:39:32	D	22.70
41	GURDASPUR	DHARIWAL	AQUA	31.86200	75.29400	13:39:32	D	43.10
42	GURDASPUR	DHARIWAL	AQUA	31.86500	75.30600	13:39:32	D	18.20
43	GURDASPUR	GURDASPUR	S-NPP	32.01234	75.29359	13:11:53	D	5.20
44	GURDASPUR	GURDASPUR	S-NPP	32.06528	75.26584	13:11:53	D	15.40
45	GURDASPUR	KALANAUR	S-NPP	31.96222	75.15508	13:11:53	D	10.90
46	GURDASPUR	QADIAN	S-NPP	31.77570	75.40453	13:11:53	D	10.90
47	GURDASPUR	QADIAN	AQUA	31.78100	75.42400	13:39:32	D	13.80
48	GURDASPUR	SRI HARGOBINDPUR	S-NPP	31.60556	75.41376	13:11:53	D	10.40
49	HOSHIARPUR	BHUNGA	S-NPP	31.70790	75.77411	13:11:53	D	12.80
50	HOSHIARPUR	GARH SHANKAR	AQUA	31.14700	76.20300	13:39:32	D	12.50
51	HOSHIARPUR	HOSHIARPUR-2	S-NPP	31.36818	75.81532	13:11:53	D	18.50
52	HOSHIARPUR	MAHILPUR	S-NPP	31.28118	75.89272	13:11:53	D	9.40
53	JALANDHAR	BHOGPUR	S-NPP	31.51416	75.65389	13:11:53	D	7.00
54	JALANDHAR	LOHIAN	S-NPP	31.10732	75.20156	13:11:53	D	6.30
55	JALANDHAR	MEHATPUR	S-NPP	30.99317	75.54153	13:11:53	D	5.60
56	JALANDHAR	MEHATPUR	S-NPP	30.99567	75.43767	13:11:53	D	13.70
57	JALANDHAR	NAKODAR	S-NPP	31.14659	75.56931	13:11:53	D	8.10
58	JALANDHAR	NAKODAR	S-NPP	31.16997	75.56886	13:11:53	D	8.80
59	JALANDHAR	NUR MAHAL	S-NPP	31.02931	75.69231	13:11:53	D	9.60
60	JALANDHAR	NUR MAHAL	S-NPP	31.02985	75.54884	13:11:53	D	10.60
61	JALANDHAR	NUR MAHAL	S-NPP	31.04789	75.68758	13:11:53	D	8.40
62	JALANDHAR	NUR MAHAL	S-NPP	31.06915	75.71773	13:11:53	D	14.50

63	JALANDHAR	NUR MAHAL	AQUA	31.02700	75.72000	13:39:32	D	21.00
64	JALANDHAR	PHILLAUR	S-NPP	31.03393	75.94456	13:11:53	D	7.40
65	JALANDHAR	PHILLAUR	S-NPP	31.05332	75.80031	13:11:53	D	44.30
66	JALANDHAR	PHILLAUR	S-NPP	31.06109	75.86295	13:11:53	D	7.60
67	JALANDHAR	PHILLAUR	S-NPP	31.07404	75.87041	13:11:53	D	3.80
68	JALANDHAR	PHILLAUR	S-NPP	31.08173	75.76341	13:11:53	D	6.50
69	JALANDHAR	PHILLAUR	S-NPP	31.10374	75.83873	13:11:53	D	13.60
70	JALANDHAR	PHILLAUR	S-NPP	31.10760	75.85920	13:11:53	D	9.70
71	JALANDHAR	PHILLAUR	S-NPP	31.11286	75.82568	13:11:53	D	7.70
72	JALANDHAR	PHILLAUR	S-NPP	31.14647	75.88151	13:11:53	D	9.60
73	JALANDHAR	PHILLAUR	S-NPP	31.15738	75.85736	13:11:53	D	9.20
74	JALANDHAR	PHILLAUR	AQUA	31.15500	75.81200	13:39:32	D	17.80
75	JALANDHAR	RURKA KALAN	S-NPP	31.17430	75.69382	13:11:53	D	16.40
76	JALANDHAR	SHAHKOT	AQUA	31.08100	75.25600	13:39:32	D	15.00
77	KAPURTHALA	DHILWAN	S-NPP	31.42501	75.24957	13:11:53	D	8.60
78	KAPURTHALA	DHILWAN	S-NPP	31.44502	75.31227	13:11:53	D	7.90
79	KAPURTHALA	DHILWAN	S-NPP	31.51858	75.38859	13:11:53	D	11.80
80	KAPURTHALA	DHILWAN	AQUA	31.51700	75.38700	13:39:32	D	39.70
81	KAPURTHALA	NADALA	S-NPP	31.51020	75.46858	13:11:53	D	13.30
82	KAPURTHALA	NADALA	S-NPP	31.51393	75.46762	13:11:53	D	13.30
83	KAPURTHALA	NADALA	S-NPP	31.51691	75.48343	13:11:53	D	11.30
84	KAPURTHALA	NADALA	S-NPP	31.54594	75.49252	13:11:53	D	10.30
85	KAPURTHALA	NADALA	AQUA	31.51100	75.46700	13:39:32	D	18.80
86	KAPURTHALA	PHAGWARA	S-NPP	31.30209	75.83942	13:11:53	D	10.80
87	KAPURTHALA	PHAGWARA	S-NPP	31.30298	75.83712	13:11:53	D	13.60
88	KAPURTHALA	PHAGWARA	S-NPP	31.30491	75.84732	13:11:53	D	9.60
89	KAPURTHALA	PHAGWARA	AQUA	31.29600	75.84200	13:39:32	D	21.10
90	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.14682	75.01074	13:11:53	D	14.60
91	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.14756	75.07350	13:11:53	D	10.50
92	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.16393	75.07507	13:11:53	D	16.20
93	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.30872	75.11053	13:11:53	D	15.80
94	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.36120	75.21764	13:11:53	D	6.00
95	KAPURTHALA	SULTANPUR LODHI	AQUA	31.23400	75.06500	13:39:32	D	10.30



96	KAPURTHALA	SULTANPUR LODHI	AQUA	31.23500	75.07100	13:39:32	D	25.40
97	KAPURTHALA	SULTANPUR LODHI	AQUA	31.23700	75.07800	13:39:32	D	11.70
98	LUDHIANA	LUDHIANA-2	S-NPP	30.93245	76.10970	13:11:53	D	11.20
99	LUDHIANA	LUDHIANA-2	S-NPP	30.94604	76.08009	13:11:53	D	28.60
100	LUDHIANA	LUDHIANA-2	S-NPP	30.94612	76.10107	13:11:53	D	6.10
101	LUDHIANA	LUDHIANA-2	S-NPP	30.95358	75.76832	13:11:53	D	15.20
102	LUDHIANA	LUDHIANA-2	S-NPP	31.01380	75.96019	13:11:53	D	8.40
103	LUDHIANA	MACHHIWARA	S-NPP	30.91631	76.28197	13:11:53	D	8.40
104	LUDHIANA	MACHHIWARA	S-NPP	30.99918	76.20257	13:11:53	D	11.30
105	LUDHIANA	RAIKOT	S-NPP	30.61209	75.63353	13:11:53	D	4.70
106	LUDHIANA	SIDHWAN BET	S-NPP	30.93419	75.62304	13:11:53	D	9.60
107	LUDHIANA	SIDHWAN BET	S-NPP	30.94526	75.68073	13:11:53	D	8.60
108	LUDHIANA	SIDHWAN BET	S-NPP	30.94553	75.68301	13:11:53	D	8.20
109	LUDHIANA	SIDHWAN BET	S-NPP	30.94764	75.44691	13:11:53	D	9.00
110	LUDHIANA	SIDHWAN BET	S-NPP	30.94833	75.36758	13:11:53	D	10.60
111	LUDHIANA	SIDHWAN BET	S-NPP	30.95243	75.45129	13:11:53	D	12.70
112	LUDHIANA	SIDHWAN BET	AQUA	30.96200	75.51600	13:39:32	D	36.00
113	LUDHIANA	SUDHAR	S-NPP	30.78613	75.64256	13:11:53	D	41.70
114	LUDHIANA	SUDHAR	S-NPP	30.79361	75.64066	13:11:53	D	12.10
115	MOGA	BAGHA PURANA	S-NPP	30.55921	74.96527	13:11:53	D	7.50
116	MOGA	KOT ISE KHAN AT DHARAMKOT	S-NPP	30.96805	75.19382	13:11:53	D	16.30
117	MOGA	KOT ISE KHAN AT DHARAMKOT	AQUA	30.95100	75.33300	13:39:32	D	12.20
118	MOGA	MOGA-1	S-NPP	30.73069	75.26673	13:11:53	D	9.60
119	MOGA	MOGA-1	S-NPP	30.84366	75.28813	13:11:53	D	8.90
120	MOGA	MOGA-1	AQUA	30.81700	75.27700	13:39:32	D	16.80
121	MUKTSAR	MALOUT	S-NPP	30.23929	74.42757	13:11:53	D	14.30
122	MUKTSAR	MALOUT	S-NPP	30.25952	74.36187	13:11:53	D	9.90
123	MUKTSAR	MALOUT	S-NPP	30.28117	74.46860	13:11:53	D	3.20
124	MUKTSAR	MUKTSAR	S-NPP	30.44363	74.52422	13:11:53	D	2.10
125	MUKTSAR	MUKTSAR	S-NPP	30.49205	74.62112	13:11:53	D	11.80
126	PATHANKOT	NAROT JAIMAL SINGH	S-NPP	32.26751	75.38287	13:11:53	D	17.00
127	PATHANKOT	SUJANPUR	S-NPP	32.34885	75.68546	02:01:53	N	1.00
128	PATIALA	NABHA	S-NPP	30.38747	76.22823	13:11:53	D	9.30

129	PATIALA	NABHA	S-NPP	30.40119	76.26913	13:11:53	D	12.30
130	PATIALA	NABHA	AQUA	30.46000	76.32800	13:39:32	D	10.70
131	SANGRUR	BHAWANIGARH	S-NPP	30.22189	76.08677	13:11:53	D	14.80
132	SANGRUR	BHAWANIGARH	S-NPP	30.22936	76.10627	13:11:53	D	6.30
133	SANGRUR	MALERKOTLA-1	S-NPP	30.54648	76.05221	13:11:53	D	6.60
134	SBS NAGAR	AUR	S-NPP	31.00444	76.02334	13:11:53	D	7.00
135	SBS NAGAR	AUR	S-NPP	31.02236	76.00574	13:11:53	D	6.60
136	SBS NAGAR	AUR	S-NPP	31.05626	76.00255	13:11:53	D	8.30
137	SBS NAGAR	AUR	S-NPP	31.09439	75.93191	13:11:53	D	9.90
138	SBS NAGAR	AUR	S-NPP	31.09636	75.92886	13:11:53	D	11.20
139	SBS NAGAR	AUR	S-NPP	31.09806	75.93098	13:11:53	D	7.50
140	SBS NAGAR	AUR	S-NPP	31.11019	75.95449	13:11:53	D	11.60
141	SBS NAGAR	AUR	AQUA	31.03700	76.10000	13:39:32	D	23.00
142	SBS NAGAR	AUR	AQUA	31.12200	75.97000	13:39:32	D	12.00
143	SBS NAGAR	BANGA	S-NPP	31.17532	75.95401	13:11:53	D	9.70
144	SBS NAGAR	BANGA	S-NPP	31.17992	75.95815	13:11:53	D	8.70
145	SBS NAGAR	BANGA	S-NPP	31.22123	76.01637	13:11:53	D	8.60
146	SBS NAGAR	BANGA	S-NPP	31.24723	75.89597	13:11:53	D	60.80
147	SBS NAGAR	BANGA	S-NPP	31.25090	75.89506	13:11:53	D	60.80
148	SBS NAGAR	NAWAN SHAHR	S-NPP	31.03809	76.13424	02:01:53	N	0.90
149	TARN TARAN	CHOHLA SAHIB	S-NPP	31.30765	75.10502	13:11:53	D	15.80
150	TARN TARAN	CHOHLA SAHIB	AQUA	31.30300	75.10300	13:39:32	D	25.10
151	TARN TARAN	CHOHLA SAHIB	AQUA	31.31300	75.10100	13:39:32	D	13.60
152	TARN TARAN	GANDIWIND TATLA	S-NPP	31.51909	74.73557	13:11:53	D	6.40
153	TARN TARAN	GANDIWIND TATLA	S-NPP	31.52295	74.73455	13:11:53	D	10.60
154	TARN TARAN	KHADUR SAHIB	S-NPP	31.43613	75.18398	13:11:53	D	9.40
155	TARN TARAN	KHADUR SAHIB	S-NPP	31.44475	75.18748	13:11:53	D	22.30
156	TARN TARAN	NAUSHERA PANNUAN	AQUA	31.35000	74.90700	13:39:32	D	17.90
157	TARN TARAN	PATTI	S-NPP	31.29877	74.83072	13:11:53	D	8.30
158	TARN TARAN	TARN TARAN	AQUA	31.44100	74.89200	13:39:32	D	45.50
159	TARN TARAN	TARN TARAN	AQUA	31.44400	74.90600	13:39:32	D	23.60
160	TARN TARAN	VALTOHA	S-NPP	31.19908	74.61439	13:11:53	D	7.50

### Details of residue burning events in Haryana on 20-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	JIND	ALEWA	S-NPP	29.50597	76.34803	13:11:53	D	9.80
2	SIRSA	SIRSA	S-NPP	29.66196	75.16290	13:11:53	D	10.70

### Details of residue burning events in Uttar Pradesh on 20-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	AZAMGARH	BURHANPUR	S-NPP	26.35458	82.93789	13:11:53	D	66.00
2	AZAMGARH	BURHANPUR	AQUA	26.35300	82.93700	13:39:32	D	27.10
3	AZAMGARH	LALGANJ	S-NPP	25.78823	82.97297	13:11:53	D	9.60
4	BANDA	BABERU	S-NPP	25.44585	80.63278	02:01:53	N	1.10
5	FATEHPUR	KHAGA	AQUA	25.96800	81.04900	13:39:32	D	11.20
6	GHAZIABAD	MODINAGAR	S-NPP	28.76174	77.57832	02:01:53	N	0.80
7	HAMIRPUR	SARILA	S-NPP	25.74170	79.59098	02:01:53	N	1.20
8	HARDOI	BILGRAM	AQUA	27.10700	80.24200	13:39:32	D	11.00
9	HARDOI	BILGRAM	AQUA	27.10900	80.25200	13:39:32	D	10.80
10	JHANSI	JHANSI	S-NPP	25.50064	78.61299	02:01:53	N	0.70
11	LALITPUR	LALITPUR	S-NPP	24.62866	78.62050	02:01:53	N	0.40
12	LALITPUR	LALITPUR	S-NPP	24.76424	78.49352	02:01:53	N	0.60
13	SHAHJAHANPUR	SHAHJAHANPUR	S-NPP	27.75338	80.00787	02:01:53	N	0.30
14	SIDDHARTHANAGAR	ITWA	S-NPP	27.36677	82.65414	02:01:53	N	1.60
15	SIDDHARTHANAGAR	SHOHRATGARH	S-NPP	27.39063	83.04741	13:11:53	D	14.40

## Details of wheat residue burning events in Madhya Pradesh on 20-May-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	ASHOKNAGAR	ISAGARH	S-NPP	24.97976	77.93254	02:01:53	N	0.70
2	BURHANPUR	BURHANPUR	S-NPP	21.23008	76.26821	02:01:53	N	0.40
3	CHHATARPUR	BARAMALEHRA	AQUA	24.68700	79.34600	13:39:32	D	14.50
4	CHHATARPUR	CHHATARPUR	AQUA	24.79600	79.63500	13:39:32	D	14.50
5	CHHATARPUR	RAJNAGAR	S-NPP	24.87649	79.85292	02:01:53	N	0.50
6	CHHATARPUR	RAJNAGAR	AQUA	24.76700	79.99900	13:39:32	D	11.80
7	DHAR	MANAWAR	S-NPP	22.26525	75.13153	02:01:53	N	1.80
8	GUNA	RAGHOGARH	S-NPP	24.48293	77.14711	02:01:53	N	1.50
9	NARSHIMAPURA	GOTECAON	S-NPP	22.88510	79.45731	02:01:53	N	1.80
10	RAISEN	RAISEN	S-NPP	23.49153	77.68240	02:01:53	N	2.20
11	REWA	SIRMAUR	AQUA	24.73000	81.21800	13:39:32	D	12.40
12	REWA	TEONTHAR	S-NPP	25.01521	81.60667	13:11:53	D	8.80
13	SAGAR	BANDA	S-NPP	24.35668	78.99076	13:11:53	D	70.80
14	SAGAR	RAHAT GARH	S-NPP	23.83584	78.40652	02:01:53	N	0.80
15	SAGAR	SAGAR	S-NPP	23.78258	78.65292	13:11:53	D	12.60
16	SATNA	AMARPATAN	AQUA	24.45100	81.06200	13:39:32	D	19.80
17	SATNA	MAIHAR	S-NPP	24.10124	80.86440	02:01:53	N	4.00
18	SATNA	MAIHAR	S-NPP	24.36342	80.90575	02:01:53	N	1.20
19	SATNA	NAGOD	AQUA	24.56200	80.61200	13:39:32	D	13.20
20	SATNA	RAMPURBAGHLEAN	S-NPP	24.42207	81.04435	02:01:53	N	1.20
21	SHAJAPUR	BAROUD	S-NPP	23.79349	75.82472	13:11:53	D	17.40
22	SHIVPURI	NARWAR	S-NPP	25.67657	78.28883	02:01:53	N	1.20
23	SHIVPURI	NARWAR	S-NPP	25.67987	78.28944	02:01:53	N	1.00
24	SHIVPURI	SHIVPURI	S-NPP	25.47599	77.65044	02:01:53	N	1.90
25	UJJAIN	NAGDA	S-NPP	23.40787	75.60063	13:11:53	D	11.90
26	VIDESHA	VIDESHA	S-NPP	23.56076	77.78300	02:01:53	N	1.40
27	VIDESHA	VIDESHA	S-NPP	23.59234	77.68839	02:01:53	N	0.80
28	VIDESHA	VIDESHA	S-NPP	23.59623	77.68523	02:01:53	N	0.80

**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)

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