



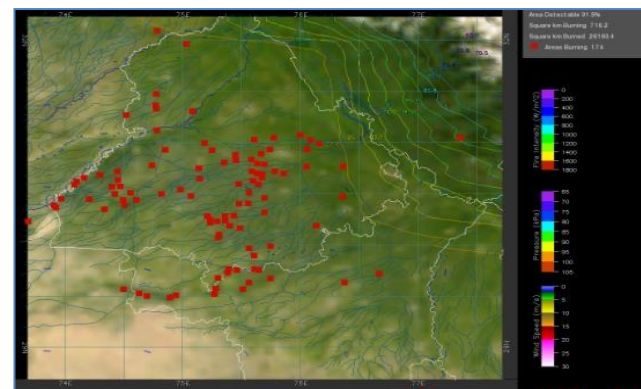
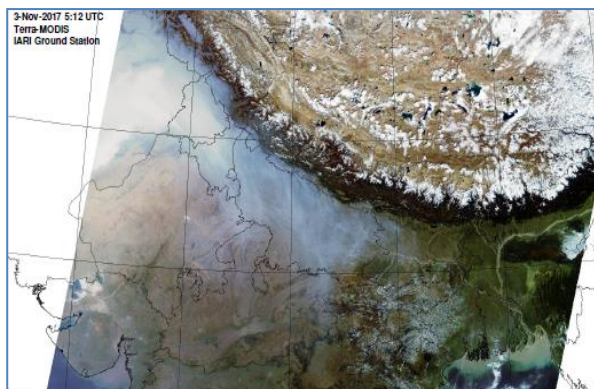
Bulletin No. 61

Events Date:
31-May-2022

Issued on:
01-June-2022



MONITORING WHEAT RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2022



Prepared by:

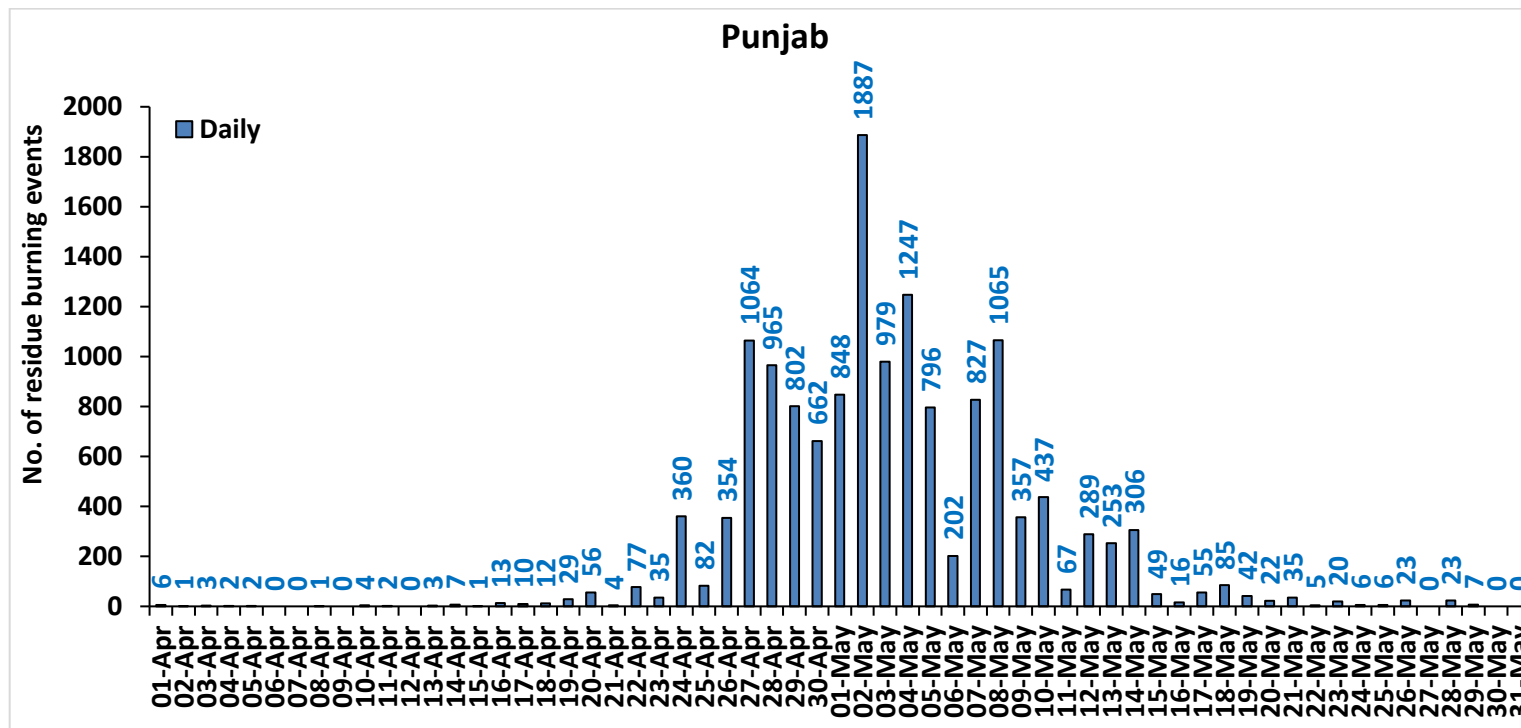
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

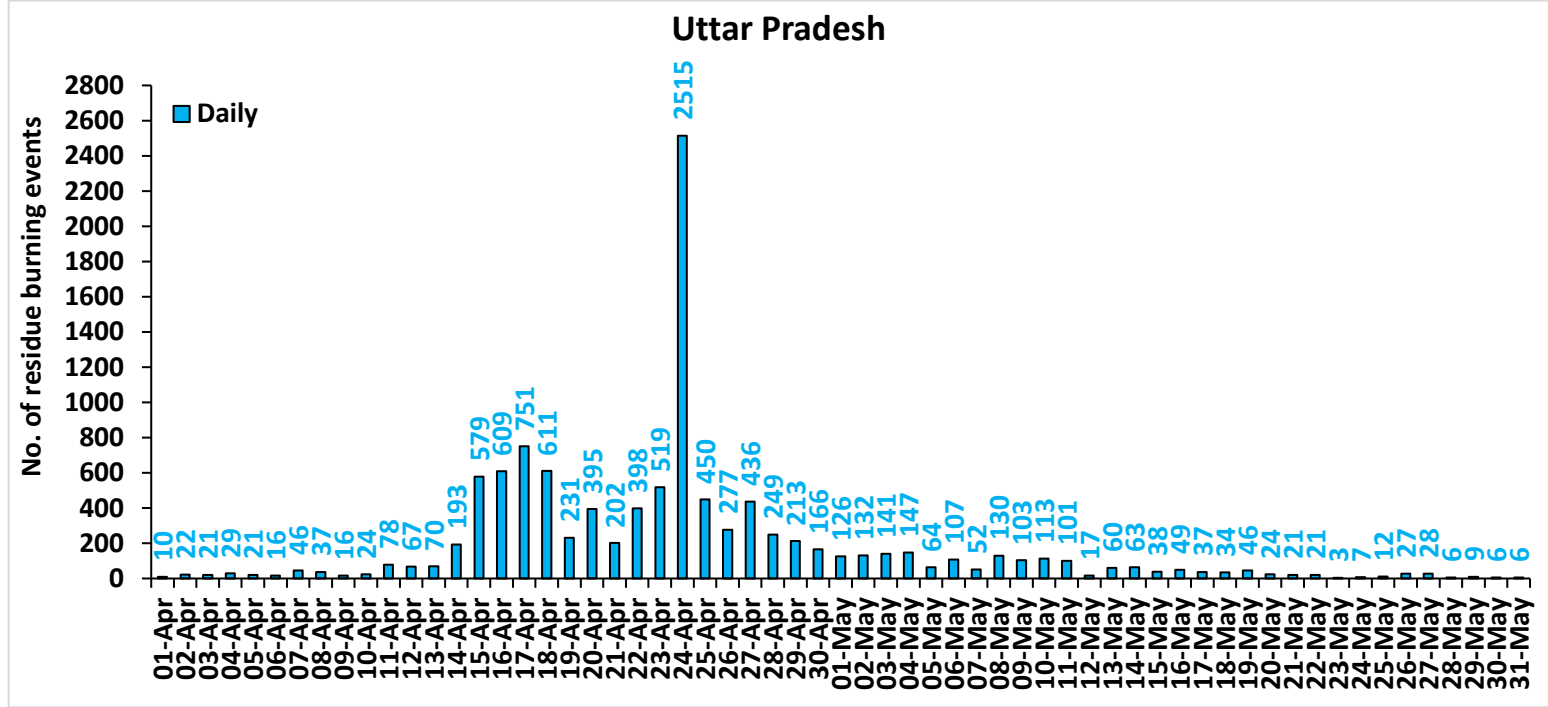
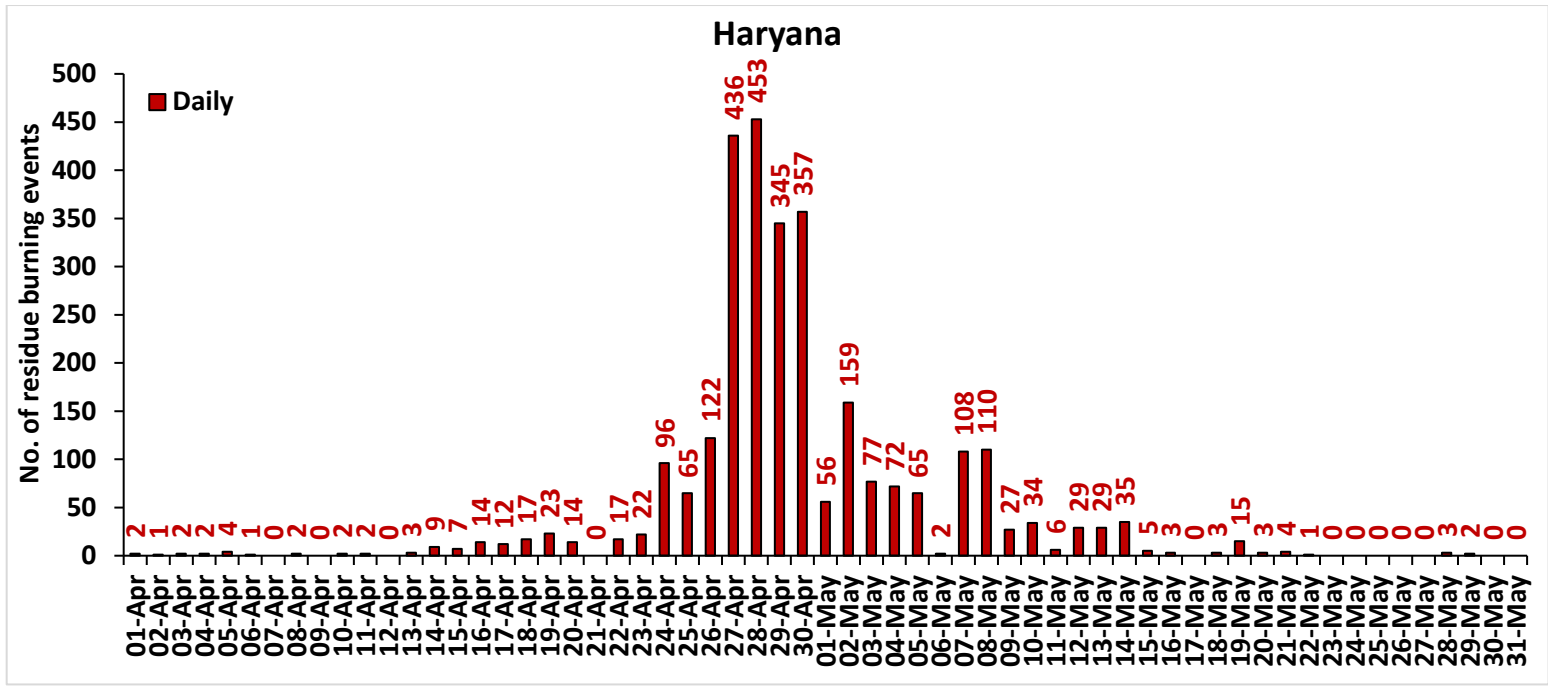
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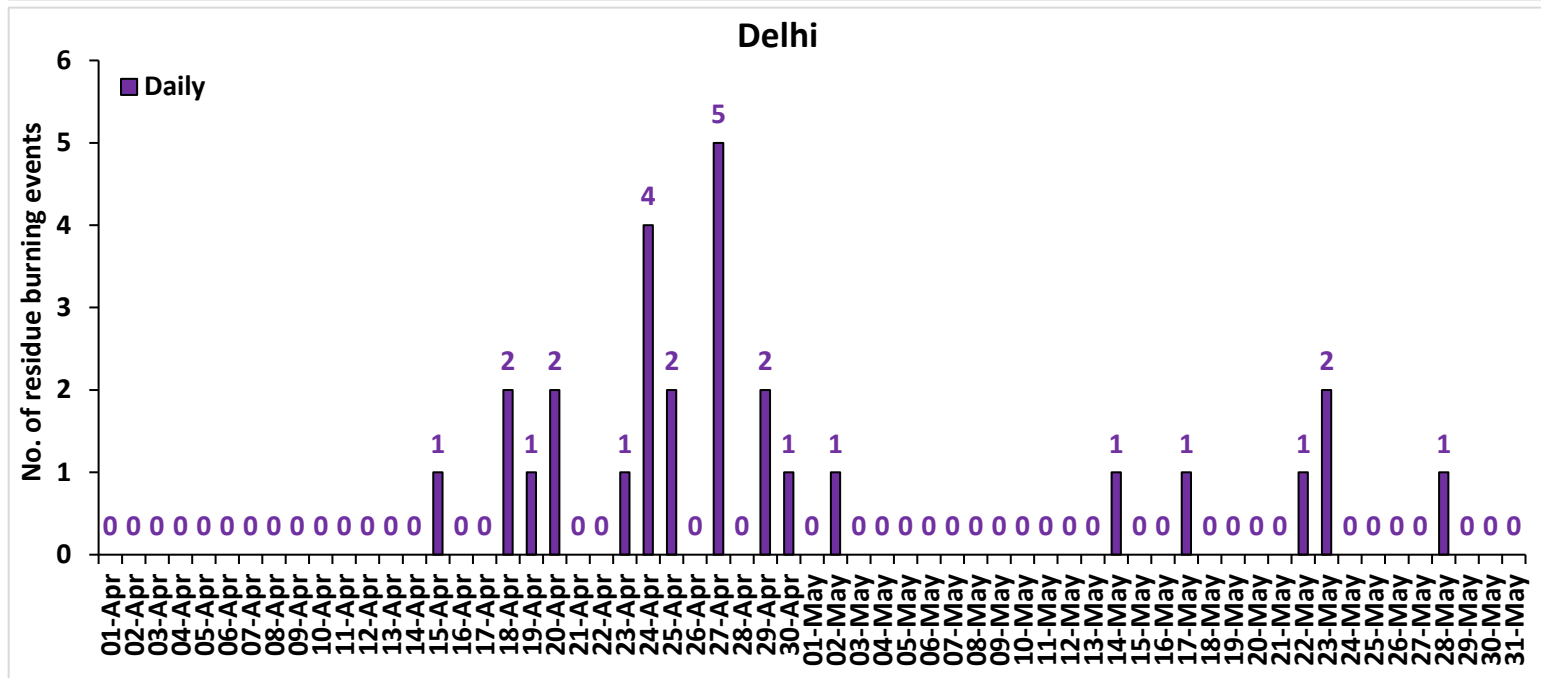
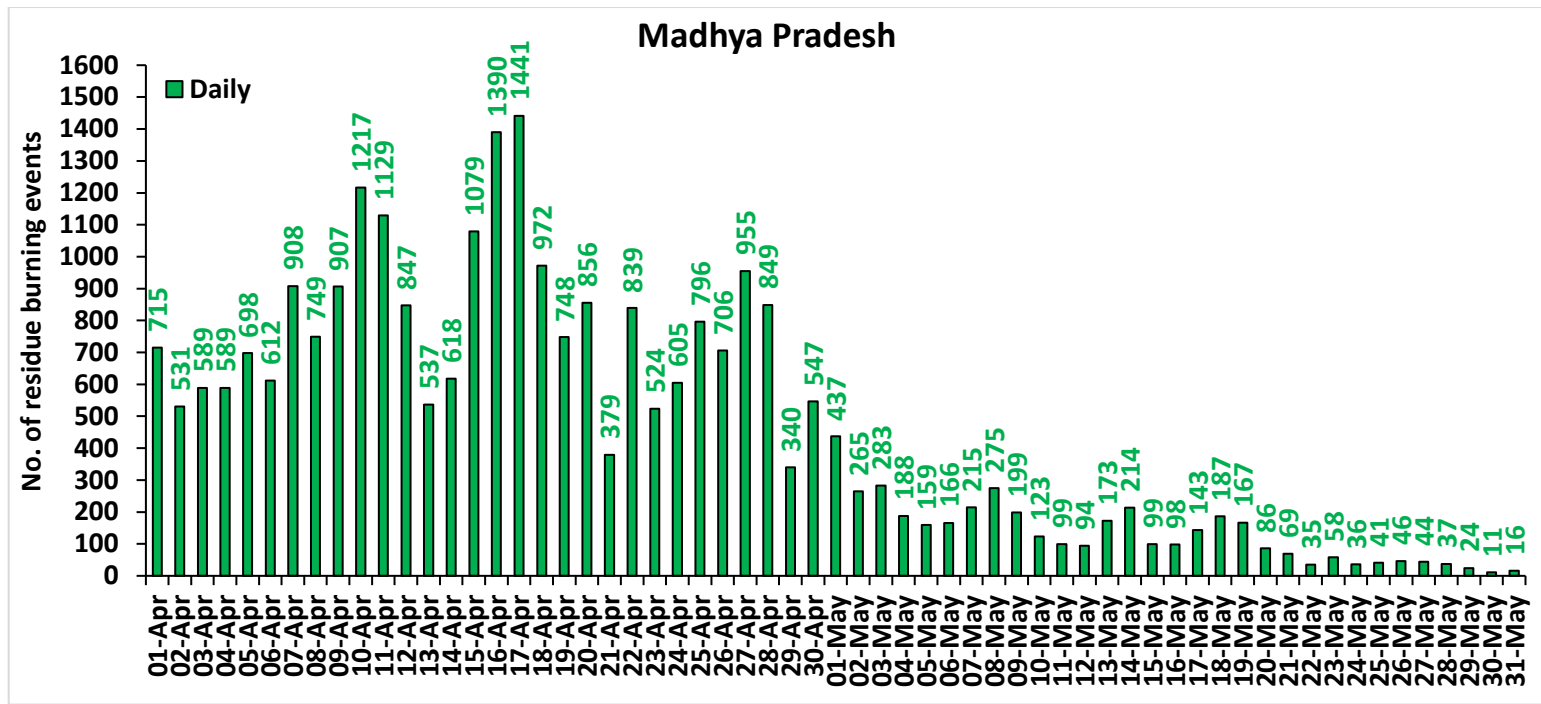
Highlights for 31-May-2022

- 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 **22** residue burning events in the five study States on 31-May-2022.
- The state wise events detected on 31-May-2022 were **00** in Punjab, **00** in Haryana, **00** in Delhi, **06** in Uttar Pradesh and **16** in Madhya Pradesh.
- The number of events has increased from **17** on 30-May-2022 to **22** on 31-May-2022 in the five study states.
- Total **56157** burning events were detected in the five states between 01-Apr-2022 and 31-May-2022, which are distributed as **14511**, **2878**, **10981**, **28**, and **27759** in Punjab, Haryana, UP, Delhi, and MP, respectively.

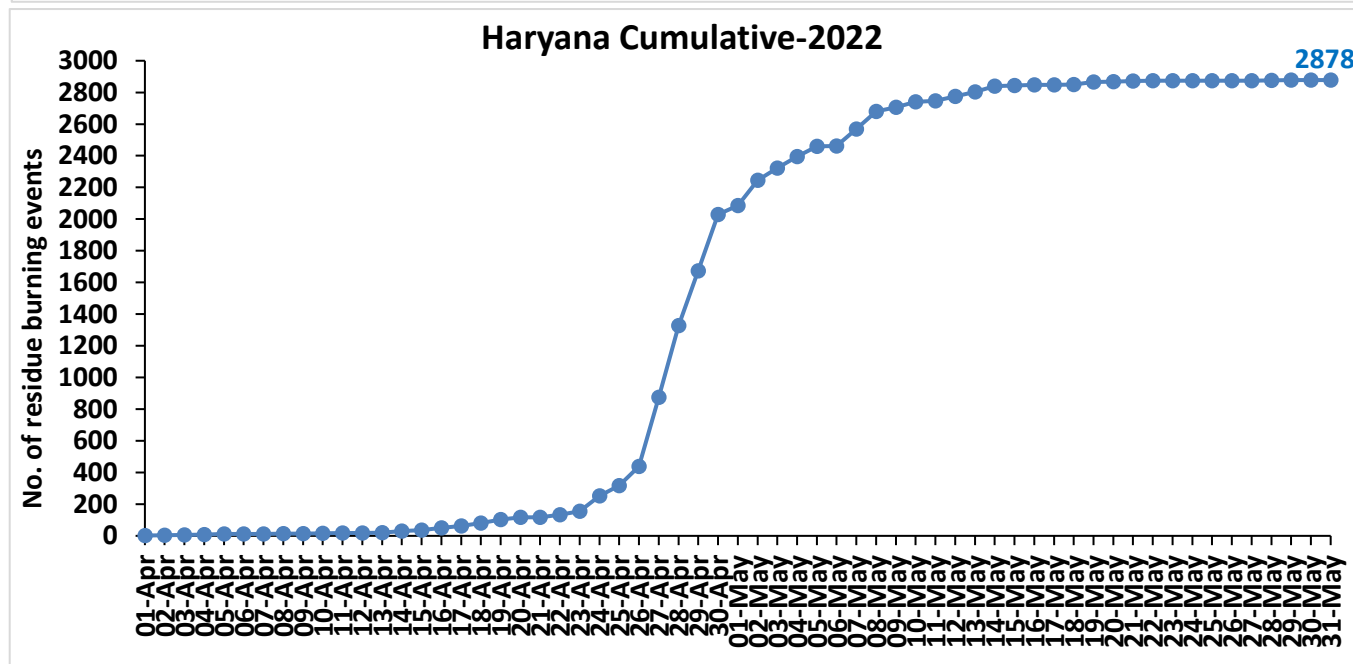
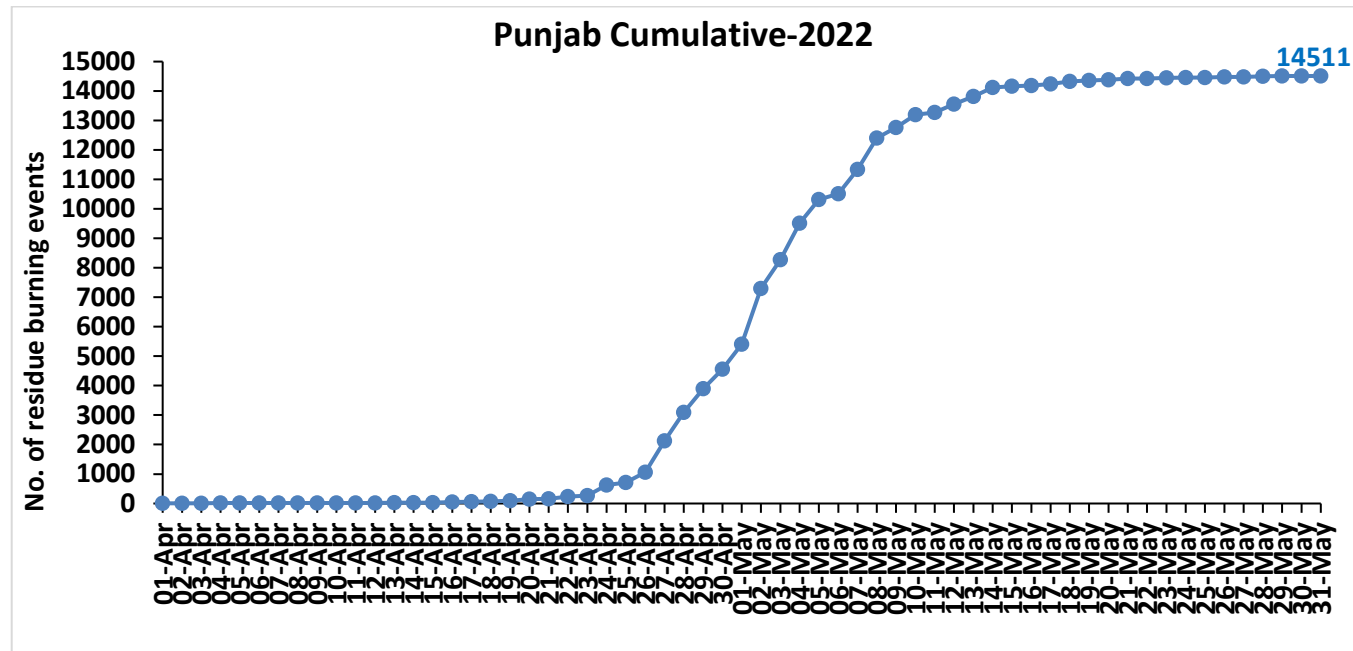
Temporal distribution of wheat residue burning events for the study States in 2022

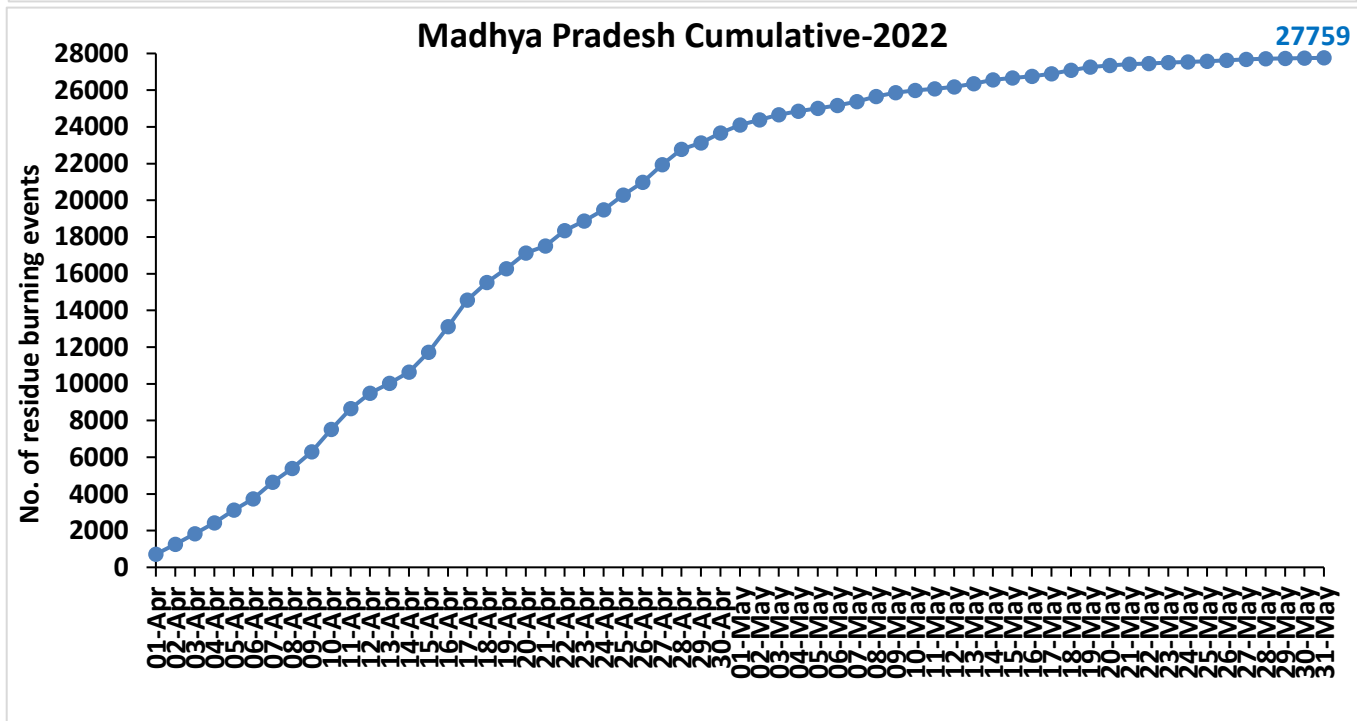
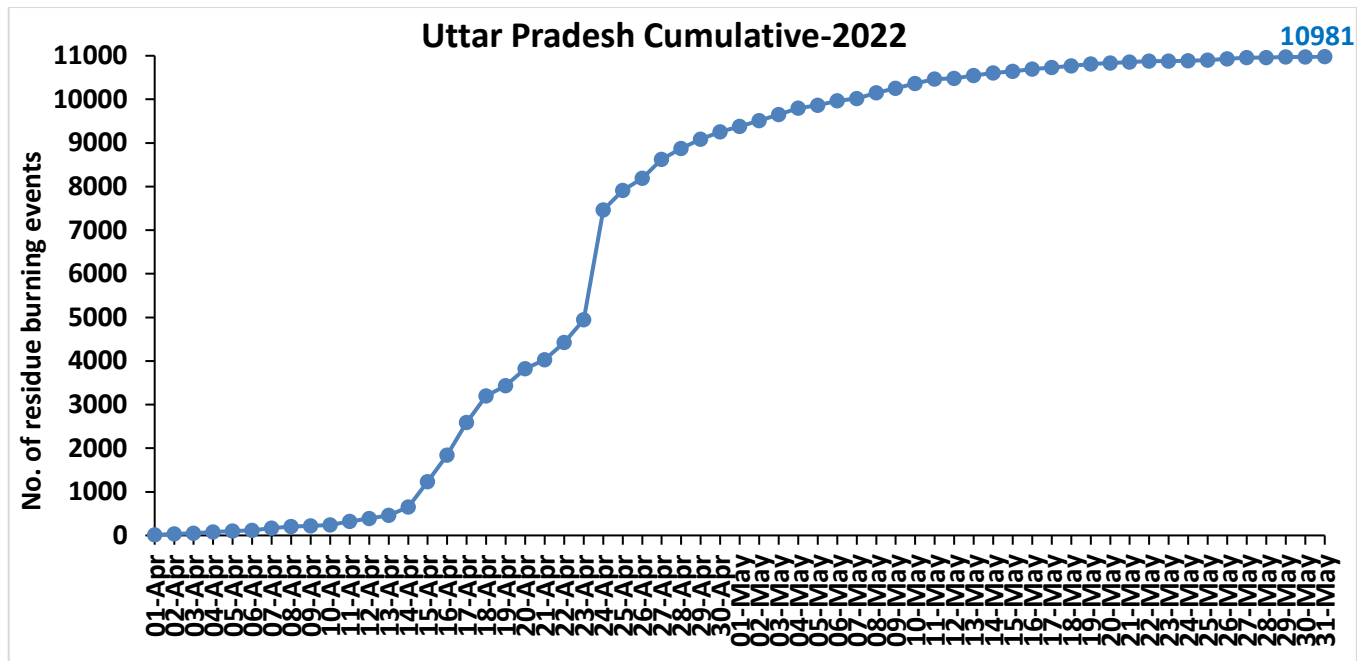


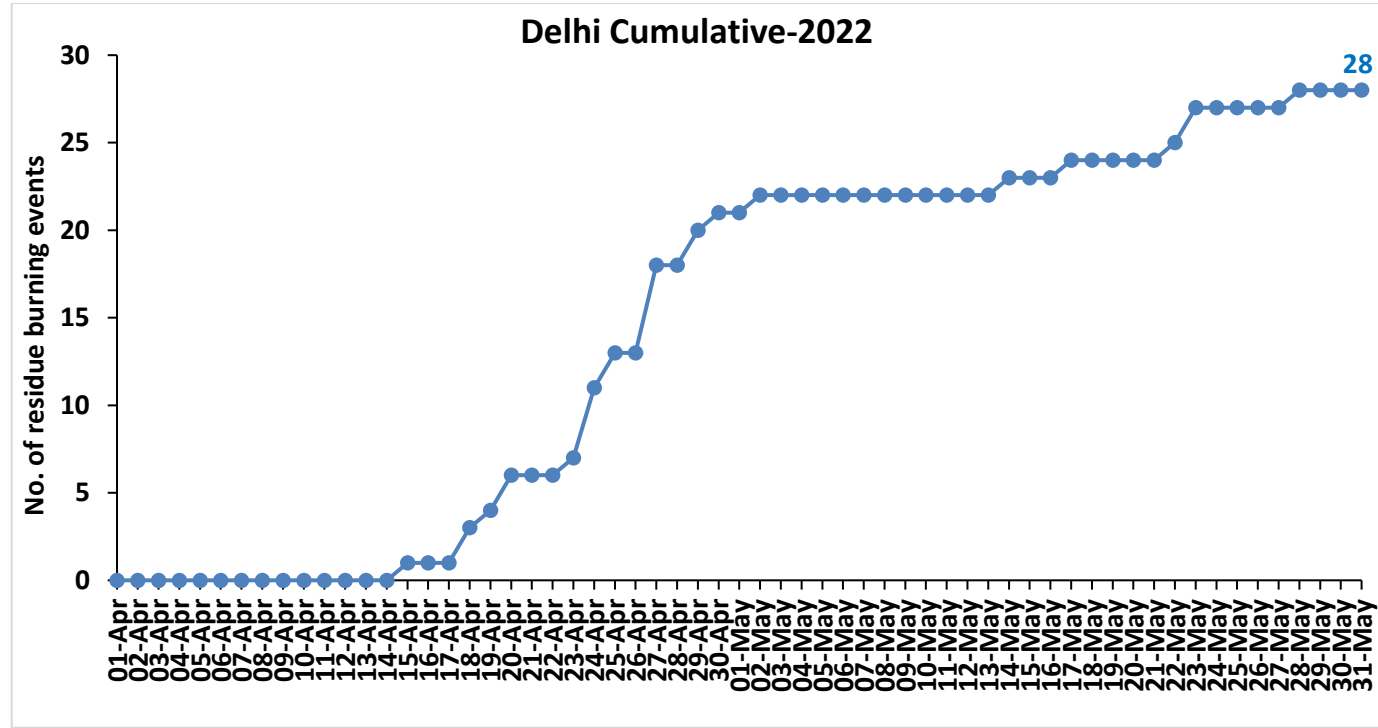




Cumulative Wheat Residue burning events in current year (2022) for the study States

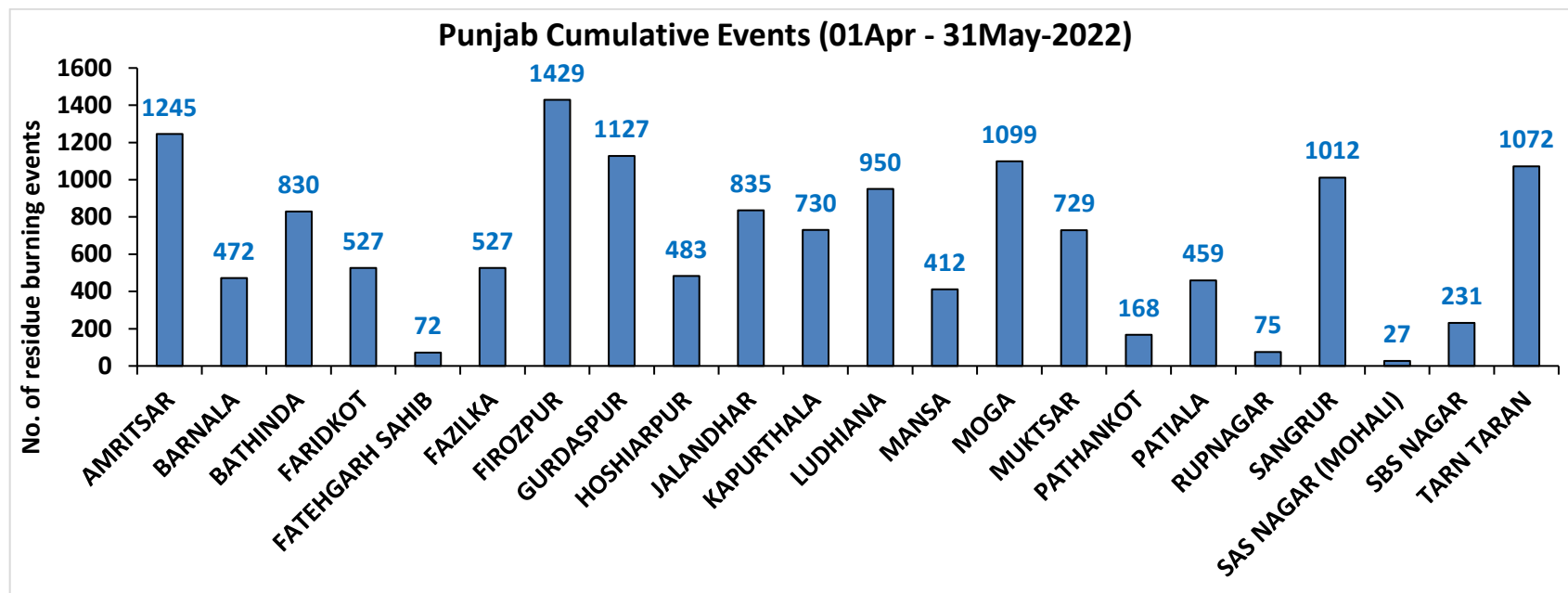






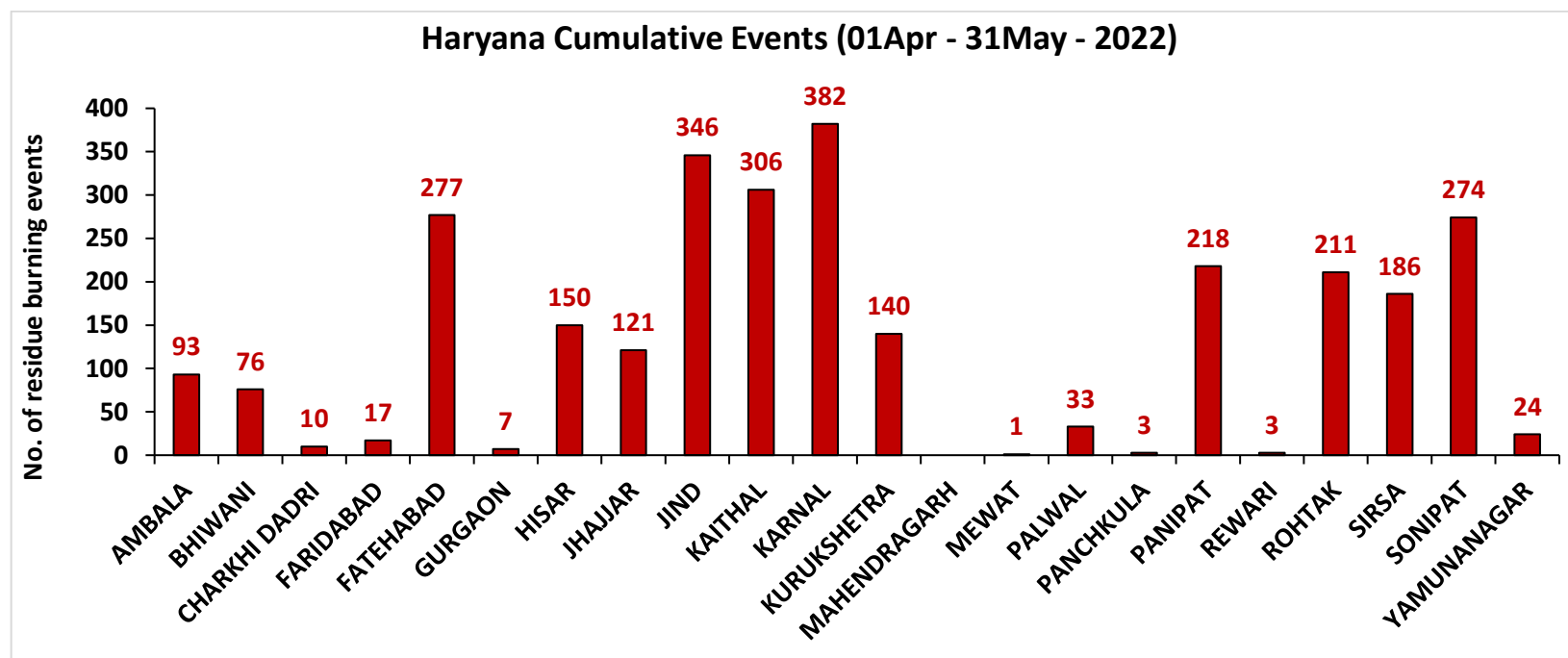
Punjab

District-wise cumulative number of wheat residue burning events in Punjab (01 Apr-31 May-2022)



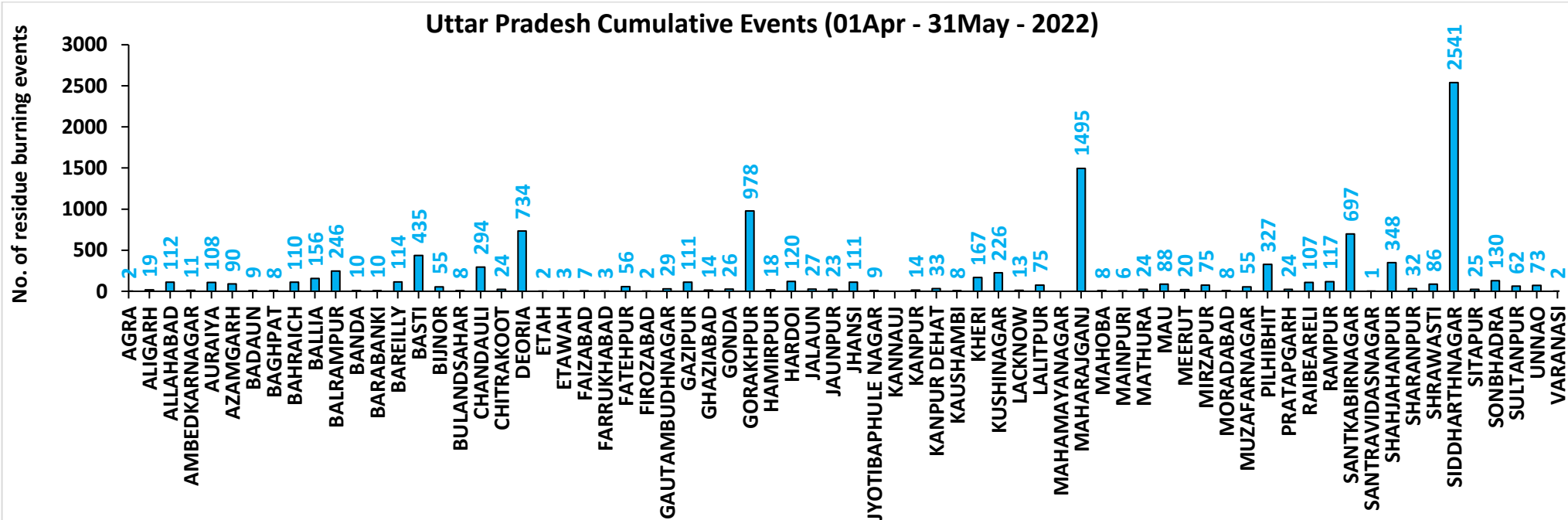
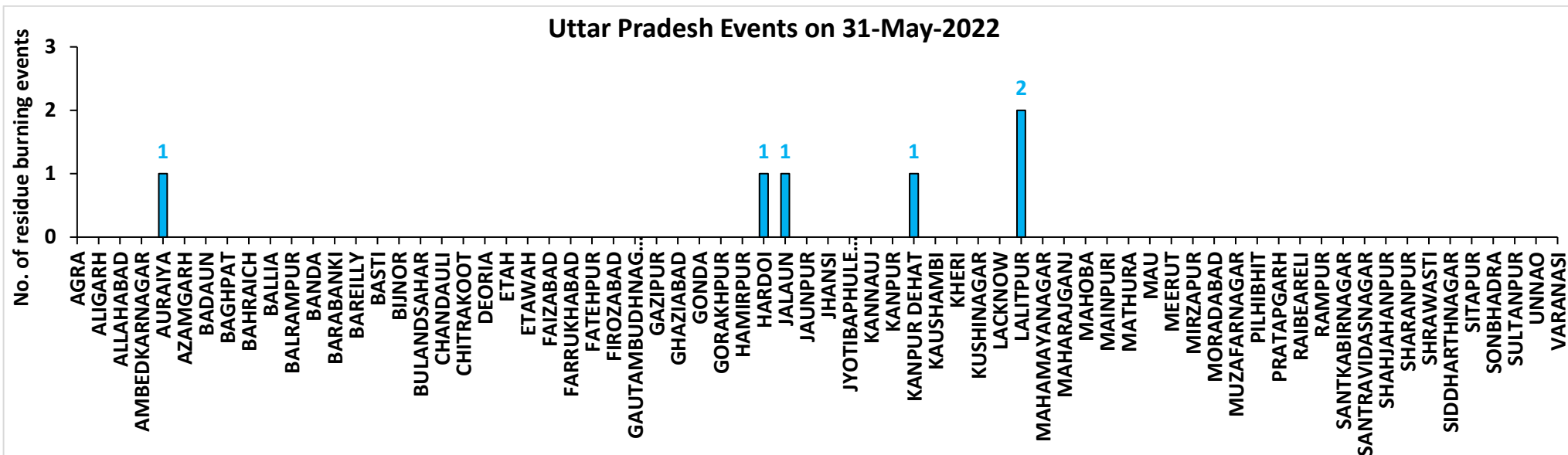
Haryana

District-wise cumulative number of residue burning events in Haryana (01 Apr-31 May-2022)



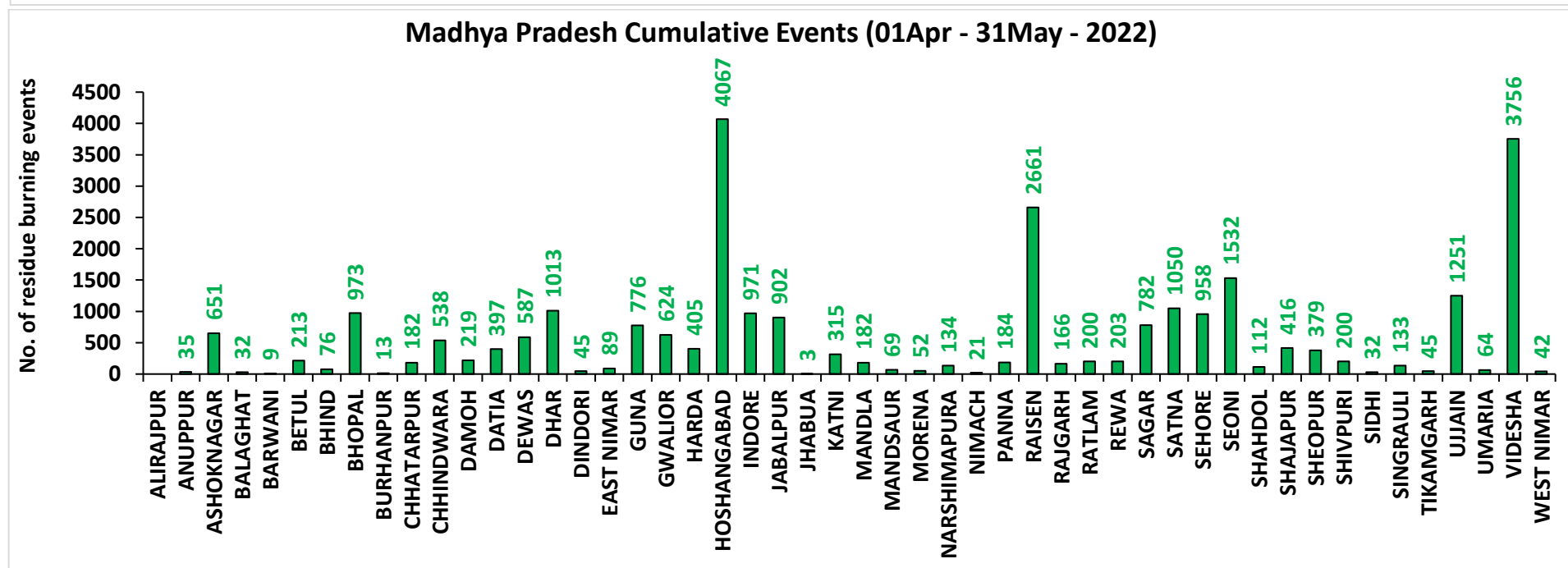
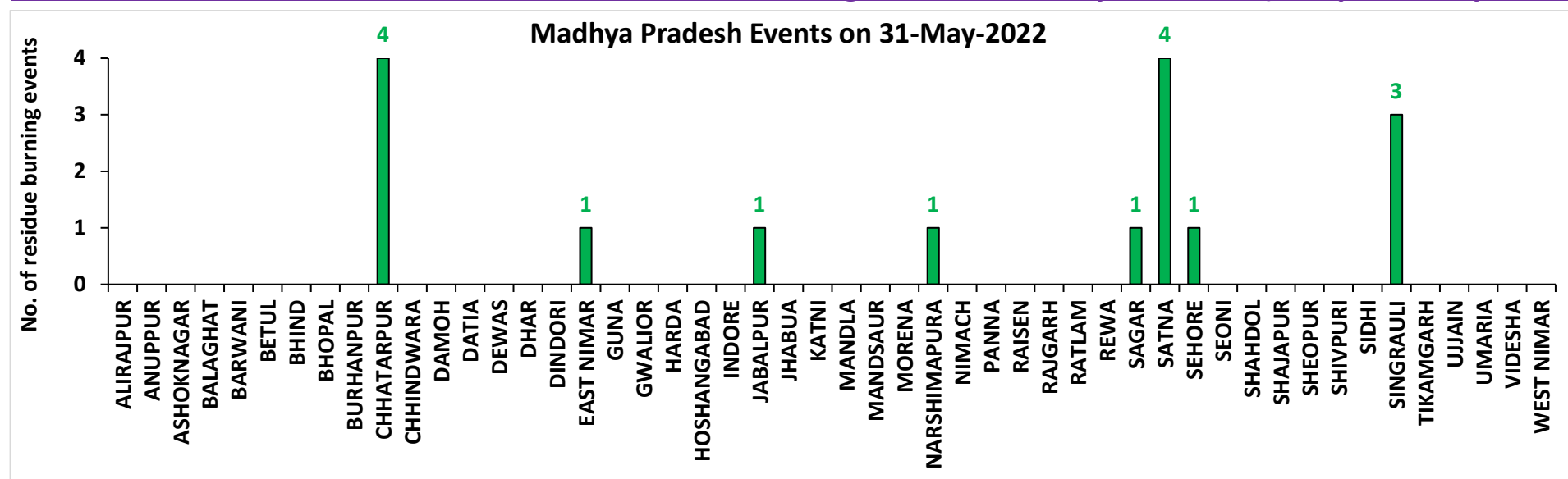
Uttar Pradesh

District-wise cumulative number of wheat residue burning events in Uttar Pradesh (01 Apr-31 May-2022)



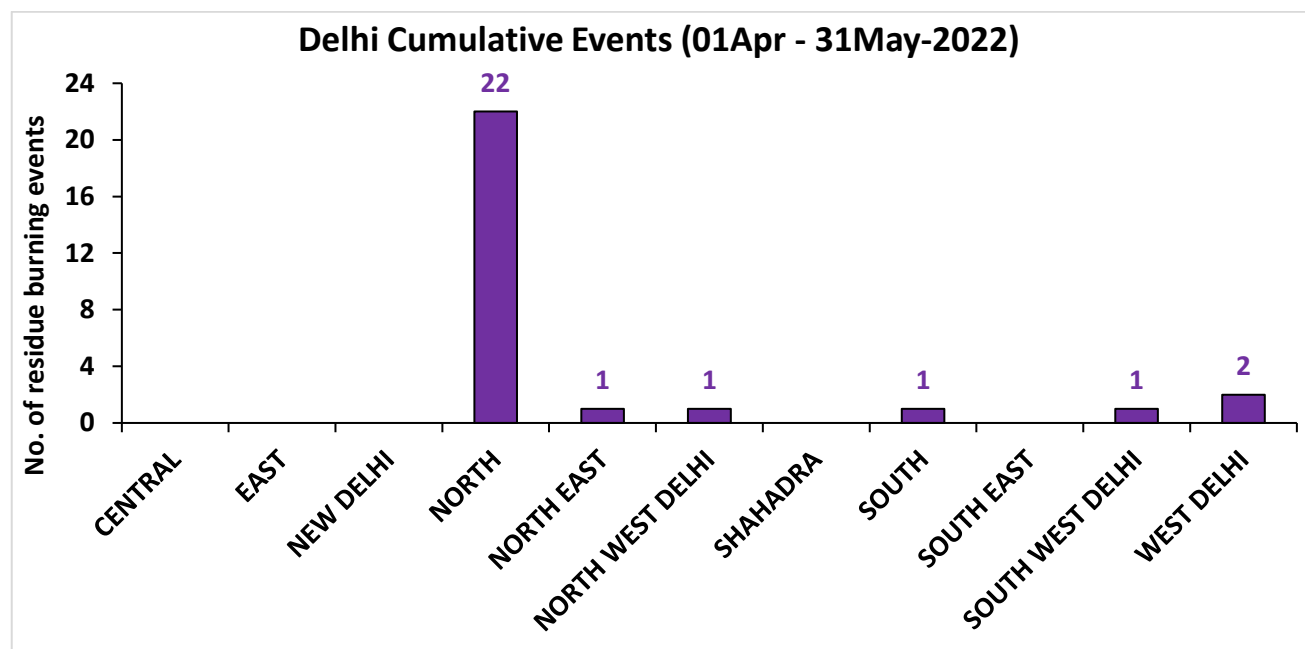
Madhya Pradesh

District-wise cumulative number of wheat residue burning events in Madhya Pradesh (01 Apr-31 May-2022)



Delhi

District-wise cumulative number of wheat residue burning events in Delhi (01 Apr-31May-2022)



District-wise cumulative number of wheat residue burning events detected in 2022
(Period: 01 April – 31 May)

(a) Punjab

District	01Apr-31 May Year 2022
Amritsar	1245
Barnala	472
Bathinda	830
Faridkot	527
Fatehgarh Sahib	72
Fazilka	527
Firozpur	1429
Gurdaspur	1127
Hoshiarpur	483
Jalandhar	835
Kapurthala	730
Ludhiana	950
Mansa	412
Moga	1099
Muktsar	729
Pathankot	168
Patiala	459
Rupnagar	75
Sangrur	1012
SAS NAGAR (Mohali)	27
SBS Nagar	231
Tarn Taran	1072
Total	14511

(b) Haryana

District	01Apr-31 May Year 2022
Ambala	93
Bhiwani	76
Charkhi Dadri	10
Faridabad	17
Fatehabad	277
Gurgaon	7
Hisar	150
Jhajjar	121
Jind	346
Kaithal	306
Karnal	382
Kurukshetra	140
Mahendragarh	0
Mewat	1
Palwal	33
Panchkula	3
Panipat	218
Rewari	3
Rohtak	211
Sirsa	186
Sonapat	274
Yamunanagar	24
Total	2878

(c) Uttar Pradesh

District	01Apr-31 May				
	Year 2022	GAUTAMBUDHNAGAR	29	MUZAFARNAGAR	55
		GAZIPUR	111	PILHIBHIT	327
AGRA	2	GHAZIABAD	14	PRATAPGARH	24
ALIGARH	19	GONDA	26	RAIBEARELI	107
ALLAHABAD	112	GORAKHPUR	978	RAMPUR	117
AMBEDKARNAGAR	11	HAMIRPUR	18	SANTKABIRNAGAR	697
AURAIYA	108	HARDOI	120	SANTRAVIDASNAGAR	1
AZAMGARH	90	JALAUN	27	SHAHJAHANPUR	348
BADAUN	9	JAUNPUR	23	SHARANPUR	32
BAGHPAT	8	JHANSI	111	SHRAWASTI	86
BAHRAICH	110	JYOTIBAPHULE NAGAR	9	SIDDHARTHANAGAR	2541
BALLIA	156	KANNAUJ	0	SITAPUR	25
BALRAMPUR	246	KANPUR	14	SONBHADRA	130
BANDA	10	KANPUR DEHAT	33	SULTANPUR	62
BARABANKI	10	KAUSHAMBI	8	UNNAO	73
BAREILLY	114	KHERI	167	VARANASI	2
BASTI	435	KUSHINAGAR	226	Total	10981
BIJNOR	55	LACKNOW	13		
BULANDSAHAR	8	LALITPUR	75		
CHANDAULI	294	MAHAMAYANAGAR	0		
CHITRAKOOT	24	MAHARAJGANJ	1495		
DEORIA	734	MAHOBAB	8		
ETAH	2	MAINPURI	6		
ETAWAH	3	MATHURA	24		
FAIZABAD	7	MAU	88		
FARRUKHABAD	3	MEERUT	20		
FATEHPUR	56	MIRZAPUR	75		
FIROZABAD	2	MORADABAD	8		

(f) Madhya Pradesh

District	01Apr-31 May		
	Year 2022	PANNA	184
ALIRAJPUR	0	RAISEN	2661
ANUPPUR	35	RAJGARH	166
ASHOKNAGAR	651	RATLAM	200
BALAGHAT	32	REWA	203
BARWANI	9	SAGAR	782
BETUL	213	SATNA	1050
BHIND	76	SEHORE	958
BHOPAL	973	SEONI	1532
BURHANPUR	13	SHAHDOL	112
CHHATARPUR	182	SHAJAPUR	416
CHHINDWARA	538	SHEOPUR	379
DAMOH	219	SHIVPURI	200
DATIA	397	SIDHI	32
DEWAS	587	SINGRAULI	133
DHAR	1013	TIKAMGARH	45
DINDORI	45	UJJAIN	1251
EAST NIMAR	89	UMARIA	64
GUNA	776	VIDESHA	3756
GWALIOR	624	WEST NIMAR	42
HARDA	405	Total	27759
HOSHANGABAD	4067		
INDORE	971		
JABALPUR	902		
JHABUA	3		
KATNI	315		
MANDLA	182		
MANDSAUR	69		
MORENA	52		
NARSHIMAPURA	134		
NIMACH	21		

(g) Delhi

District	01Apr-31 May
	2022
CENTRAL	0
EAST	0
NEW DELHI	0
NORTH	22
NORTH EAST	1
NORTH WEST DELHI	1
SHAHADRA	0
SOUTH	1
SOUTH EAST	0
SOUTH WEST DELHI	1
WEST DELHI	2
Total	28

State-wise and date-wise number of wheat residue burning events detected in 2022
(Period: 01 April – 30 May)

Date	Punjab	Haryana	UP	MP	Delhi
1-Apr	6	2	10	715	0
2-Apr	1	1	22	531	0
3-Apr	3	2	21	589	0
4-Apr	2	2	29	589	0
5-Apr	2	4	21	698	0
6-Apr	0	1	16	612	0
7-Apr	0	0	46	908	0
8-Apr	1	2	37	749	0
9-Apr	0	0	16	907	0
10-Apr	4	2	24	1217	0
11-Apr	2	2	78	1129	0
12-Apr	0	0	67	847	0
13-Apr	3	3	70	537	0
14-Apr	7	9	193	618	0
15-Apr	1	7	579	1079	1
16-Apr	13	14	609	1390	0
17-Apr	10	12	751	1441	0
18-Apr	12	17	611	972	2
19-Apr	29	23	231	748	1
20-Apr	56	14	395	856	2
21-Apr	4	0	202	379	0
22-Apr	77	17	398	839	0
23-Apr	35	22	519	524	1
24-Apr	360	96	2515	605	4
25-Apr	82	65	450	796	2
26-Apr	354	122	277	706	0
27-Apr	1064	436	436	955	5
28-Apr	965	453	249	849	0
29-Apr	802	345	213	340	2
30-Apr	662	357	166	547	1
01-May	848	56	126	437	0

02-May	1887	159	132	265	1
03-May	979	77	141	283	0
04-May	1247	72	147	188	0
05-May	796	65	64	159	0
06-May	202	2	107	166	0
07-May	827	108	52	215	0
08-May	1065	110	130	275	0
09-May	357	27	103	199	0
10-May	437	34	113	123	0
11-May	67	6	101	99	0
12-May	289	29	17	94	0
13-May	253	29	60	173	0
14-May	306	35	63	214	1
15-May	49	5	38	99	0
16-May	16	3	49	98	0
17-May	55	0	37	143	1
18-May	85	3	34	187	0
19-May	42	15	46	167	0
20-May	22	3	24	86	0
21-May	35	4	21	69	0
22-May	5	1	21	35	1
23-May	20	0	3	58	2
24-May	6	0	7	36	0
25-May	6	0	12	41	0
26-May	23	0	27	46	0
27-May	0	0	28	44	0
28-May	23	3	6	37	1
29-May	7	2	9	24	0
30-May	0	0	6	11	0
31-May	0	0	6	16	0
Total	14511	2878	10981	27759	28

Details of wheat residue burning events in Uttar Pradesh on 31-May-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AURAIYA	BIDHUNA	npp	26.64250	79.48230	5/31/2022	02:36:45	N	1.10
2	HARDOI	SIWAJPUR	npp	27.35070	79.87560	5/31/2022	13:46:45	D	13.40
3	JALAUN	KONCH	npp	25.96740	78.95190	5/31/2022	13:46:45	D	5.50
4	KANPUR DEHAT	BHOGANIPUR	npp	26.21920	79.96070	5/31/2022	13:46:45	D	8.10
5	LALITPUR	LALITPUR	npp	24.71460	78.34690	5/31/2022	13:46:45	D	12.80
6	LALITPUR	LALITPUR	npp	24.73580	78.34820	5/31/2022	13:46:45	D	8.50

Details of wheat residue burning events in Madhya Pradesh on 31-May-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	CHHATARPUR	BARAMALEHRA	npp	24.44820	78.99700	5/31/2022	13:46:45	D	17.30
2	CHHATARPUR	BARAMALEHRA	npp	24.49430	79.05890	5/31/2022	13:46:45	D	19.10
3	CHHATARPUR	BARAMALEHRA	npp	24.63190	79.21790	5/31/2022	13:46:45	D	10.00
4	CHHATARPUR	NOWGOAN	npp	25.04490	79.83540	5/31/2022	13:46:45	D	15.40
5	EAST NIMAR	KHANDWA	npp	21.85300	76.11090	5/31/2022	13:46:45	D	4.70
6	JABALPUR	PATAN	npp	23.27600	79.70680	5/31/2022	13:46:45	D	4.70
7	NARSHIMAPURA	NARSIMHAPUR	npp	22.71560	79.26840	5/31/2022	13:46:45	D	11.70
8	SAGAR	KHURAI	npp	24.24440	78.39930	5/31/2022	13:46:45	D	9.80
9	SATNA	NAGOD	npp	24.46310	80.57470	5/31/2022	02:36:45	N	1.20
10	SATNA	NAGOD	npp	24.61040	80.73780	5/31/2022	13:46:45	D	16.70
11	SATNA	RAGURAJNAGAR	npp	24.61150	80.73450	5/31/2022	13:46:45	D	11.60
12	SATNA	RAMPURBAGHLEAN	npp	24.45520	81.04460	5/31/2022	13:46:45	D	14.90
13	SEHORE	NASRULLAHGANJ	npp	22.71160	77.29170	5/31/2022	13:46:45	D	10.10
14	SINGRAULI	SINGRAULI	npp	24.17230	82.64990	5/31/2022	13:46:45	D	1.50
15	SINGRAULI	SINGRAULI	npp	24.17350	82.64840	5/31/2022	13:46:45	D	1.00
16	SINGRAULI	SINGRAULI	Aqua	24.17200	82.68600	5/31/2022	02:18:00	N	7.60

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

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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)**
