

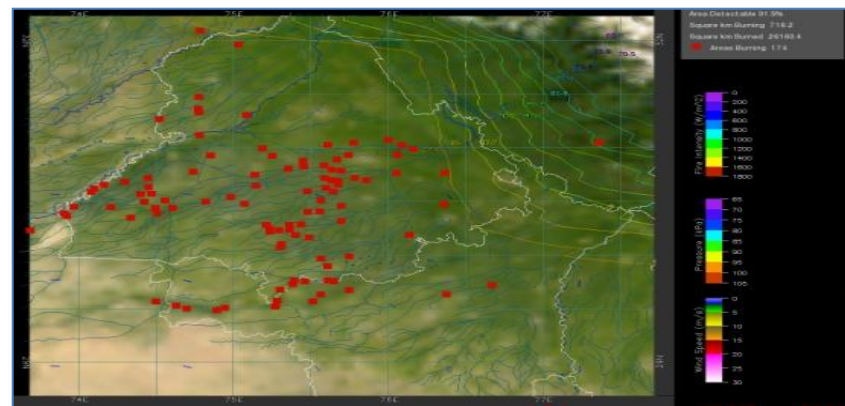
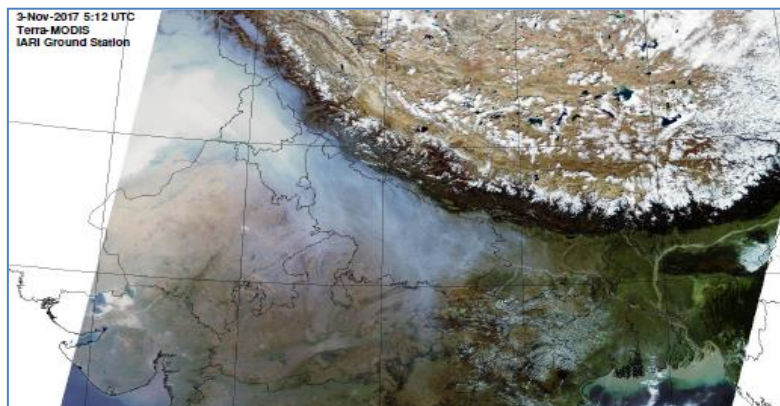


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

Bulletin
No. 18

Events Date:
02-Oct-2023

Issued on:
02-Oct-2023



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

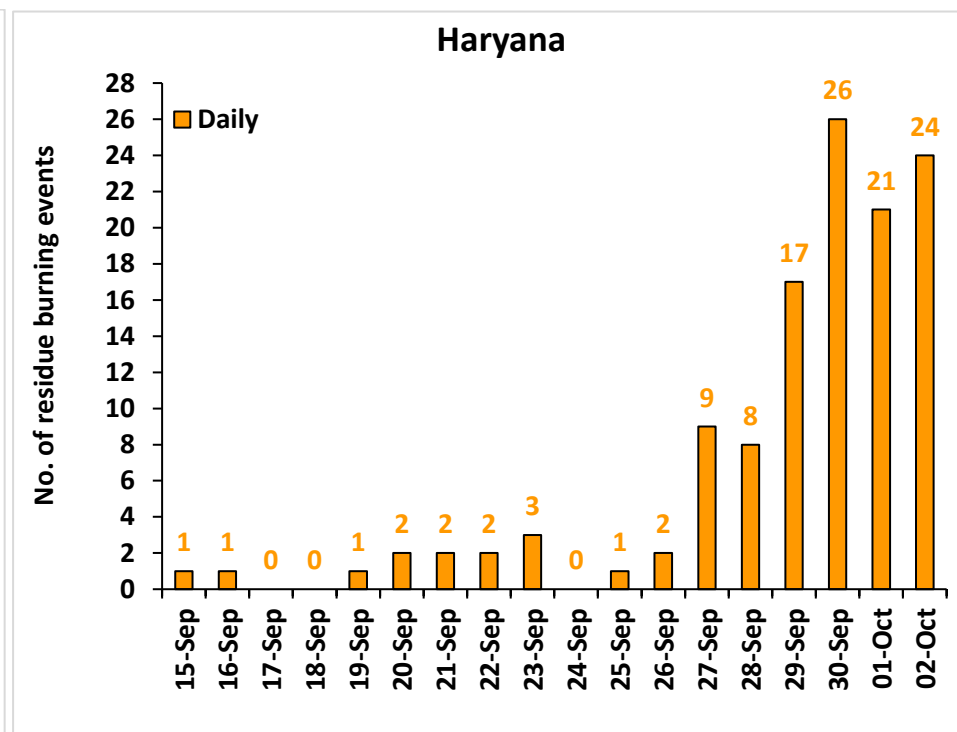
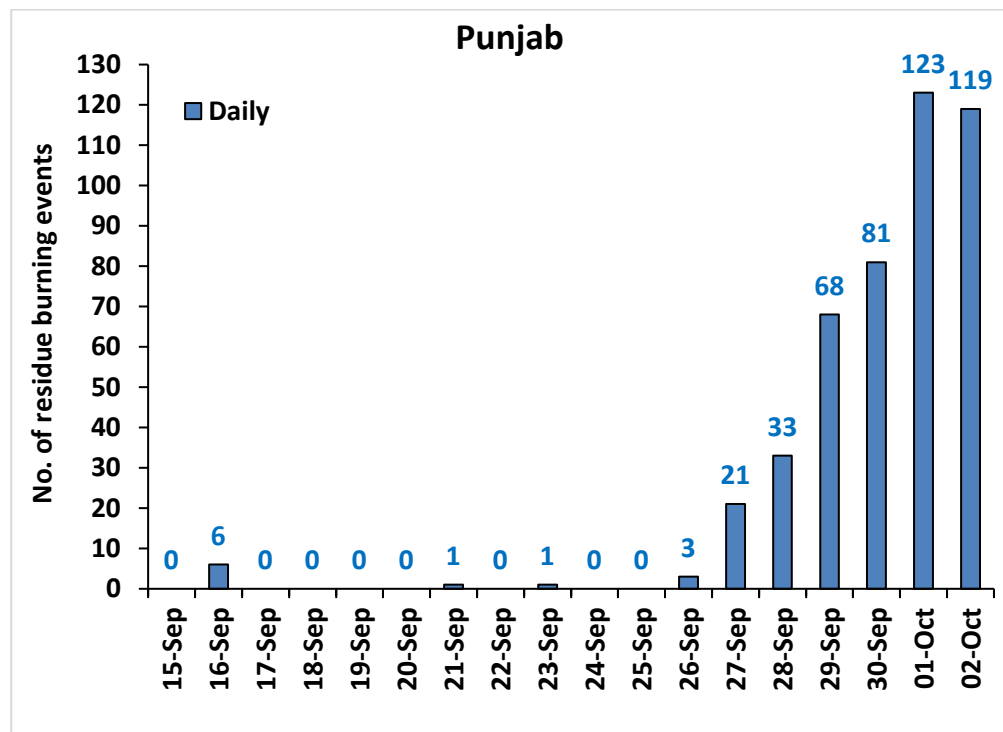
<http://creams.iari.res.in>



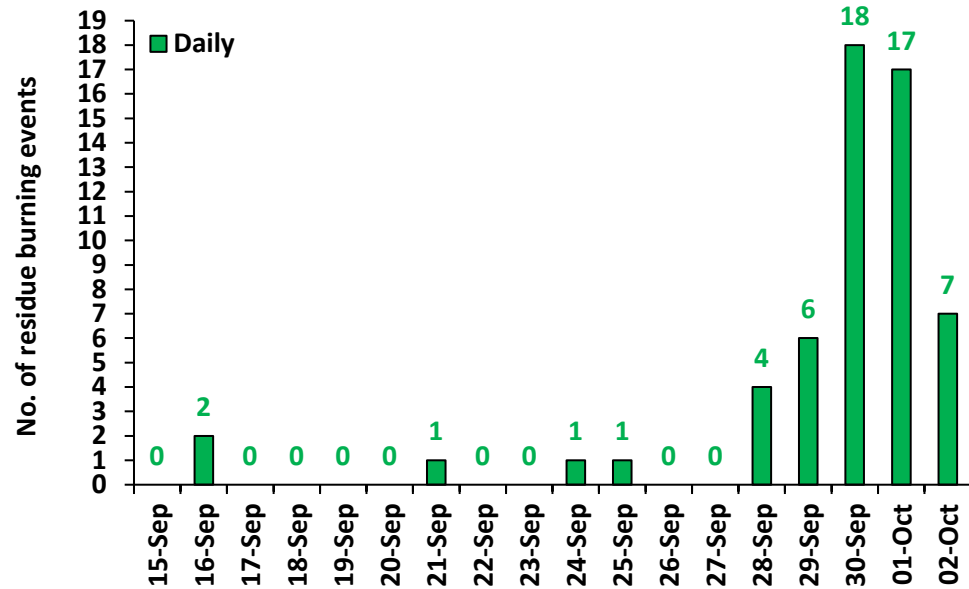
Highlights for 02-Oct-2023

- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **155** residue burning events in the six study States on 02-Oct-2023.
- The state wise events detected on 02-Oct-2023 were **119** in Punjab, **24** in Haryana, **07** in UP, **00** in Delhi, **04** in Rajasthan and **01** in MP.
- Total **682** burning events were detected in the six states between 15-Sep-2023 and 02-Oct-2023, which are distributed as **456**, **120**, **57**, **01**, **18** and **30** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.

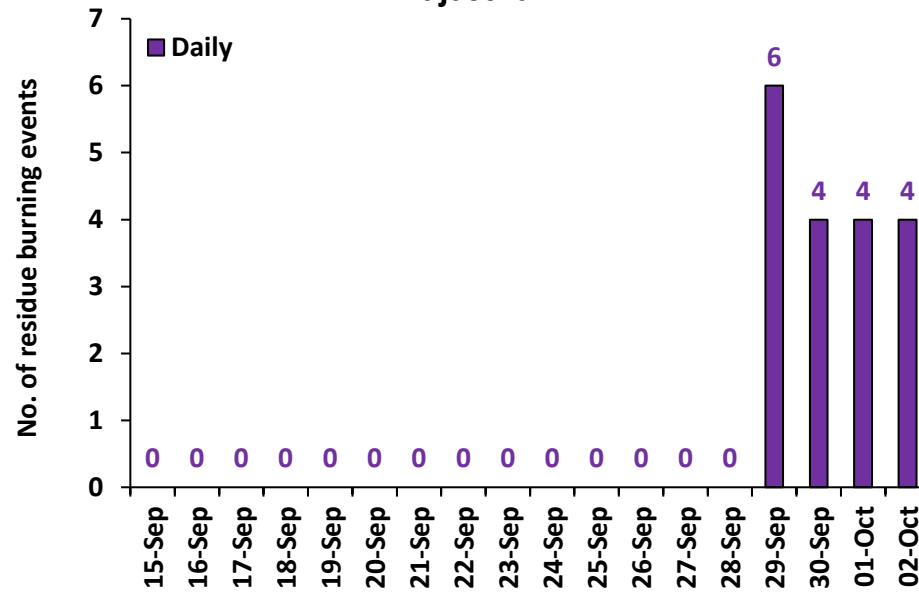
Temporal distribution of rice residue burning events for the study States in 2023



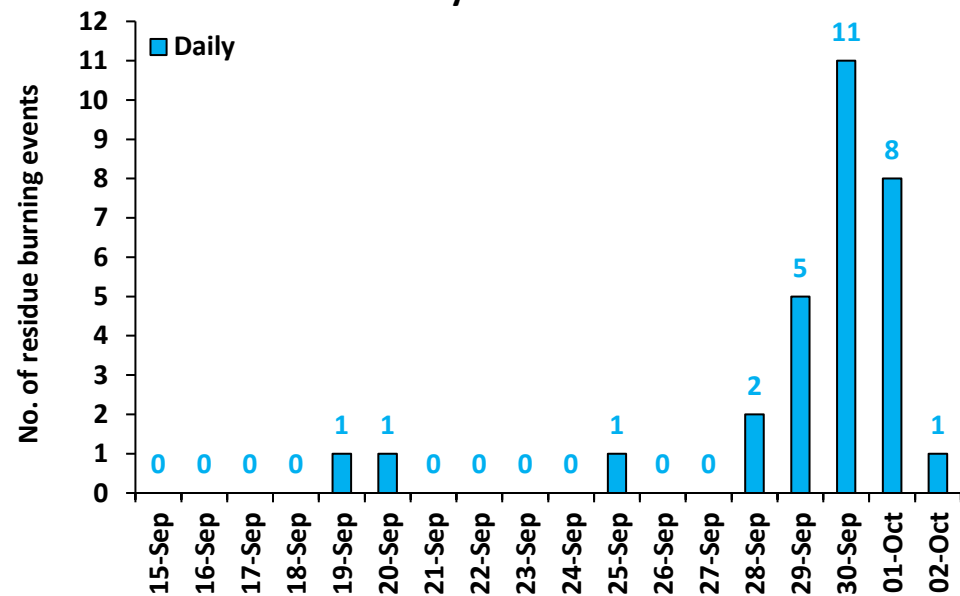
Uttar Pradesh



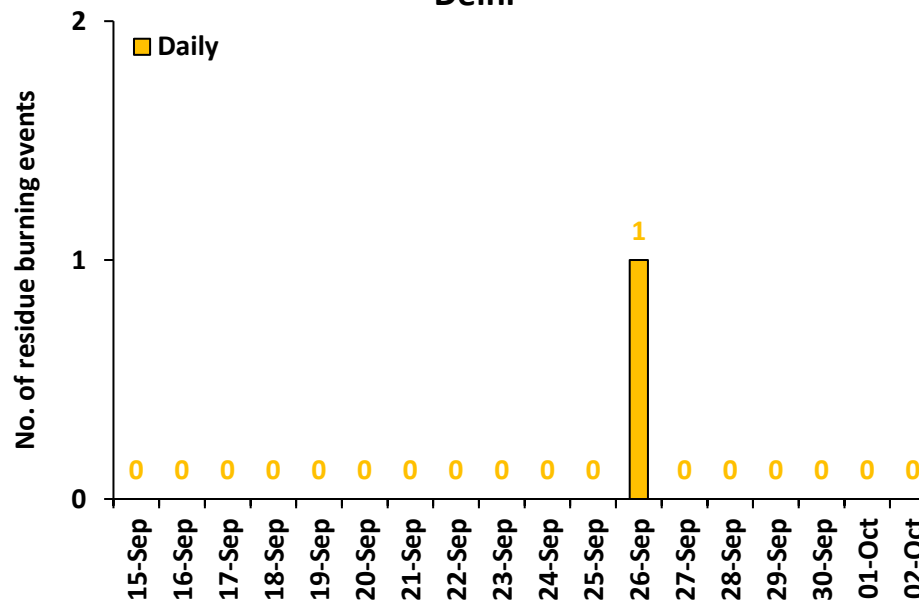
Rajasthan



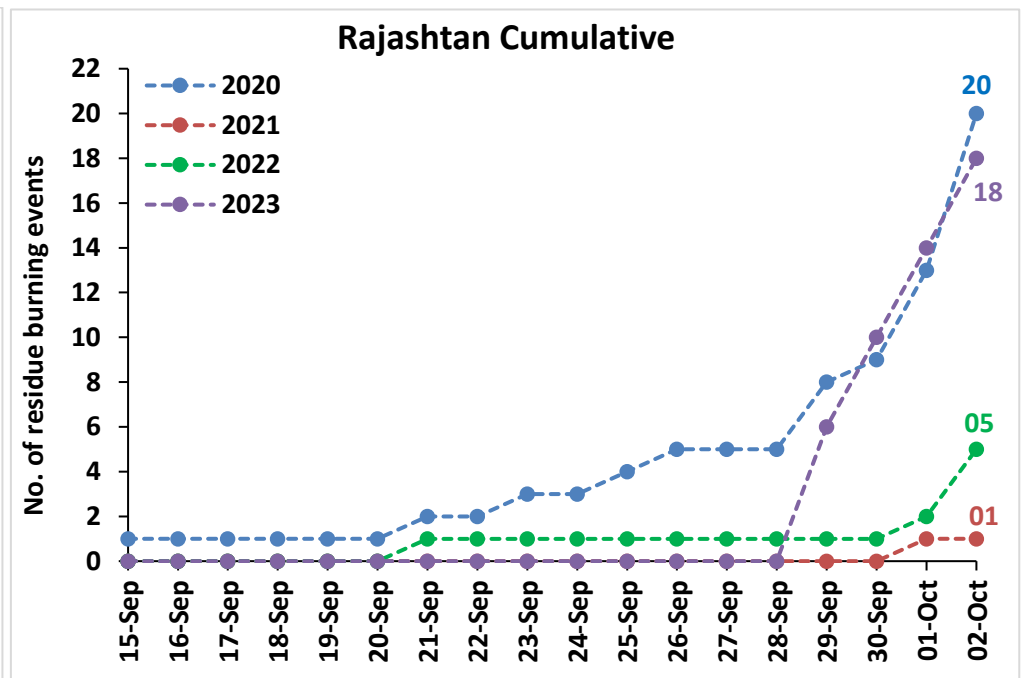
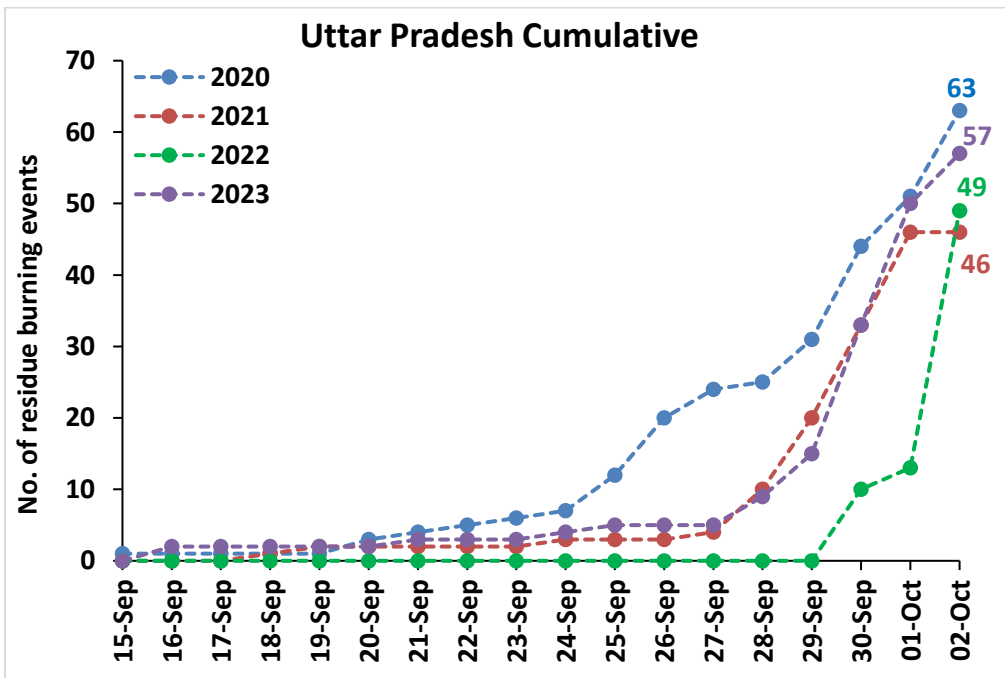
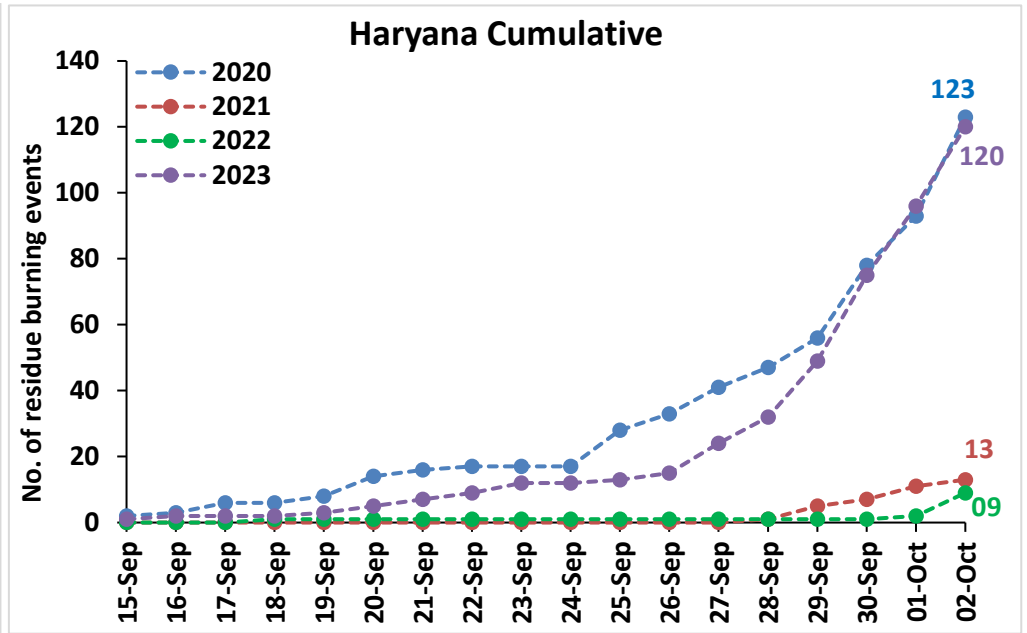
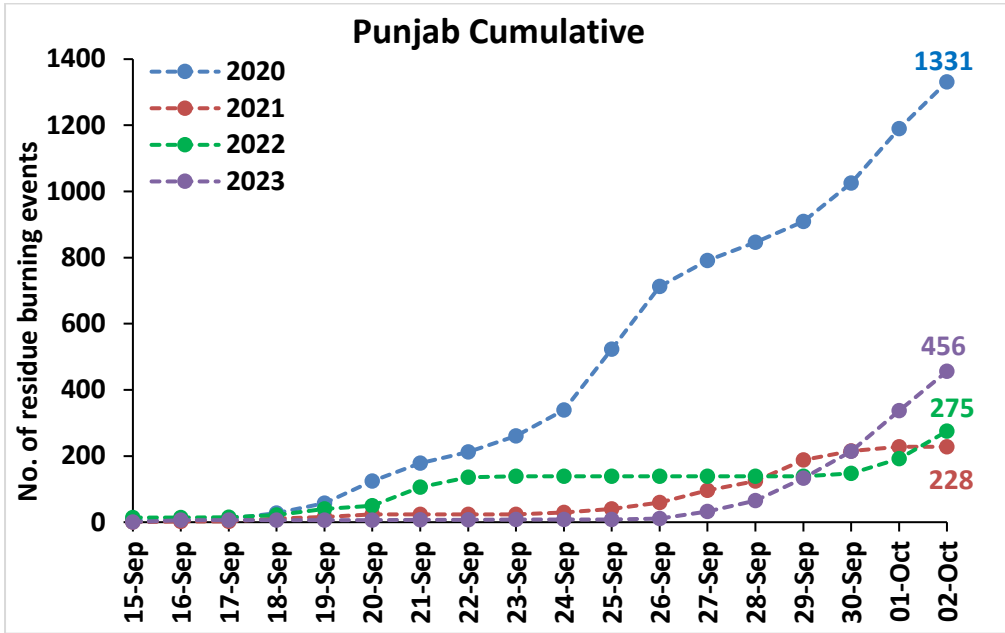
Madhya Pradesh



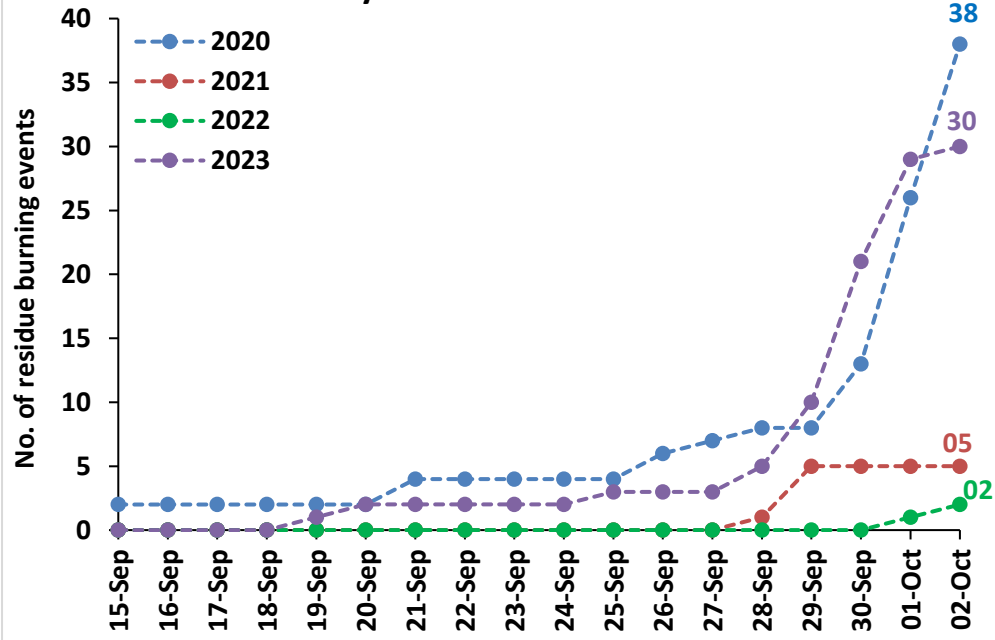
Delhi



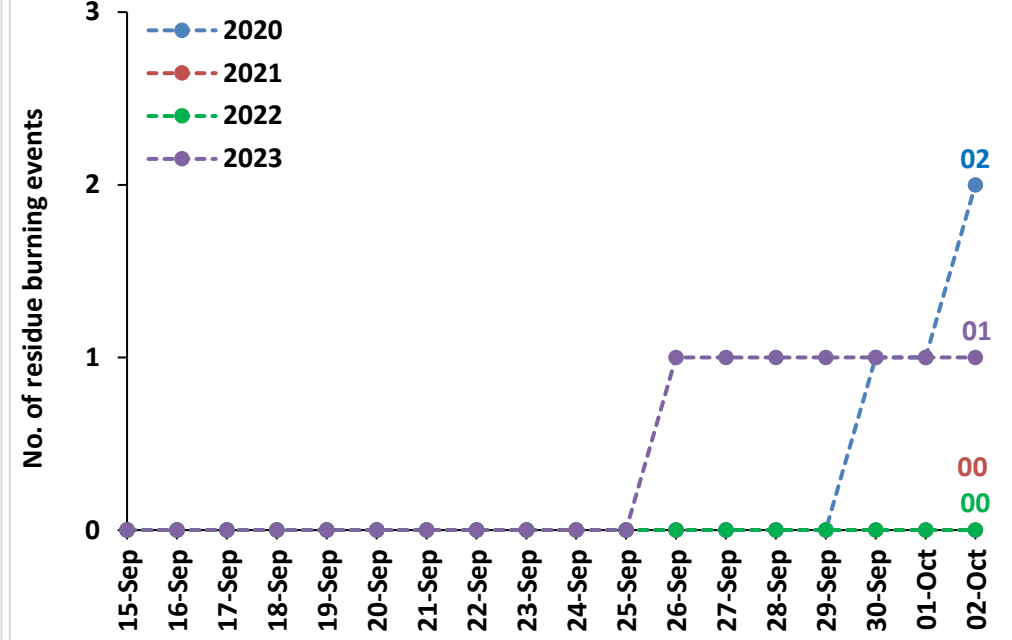
Comparison of residue burning events in current year (2023) with previous years (2020, 2021 and 2022) for the study State



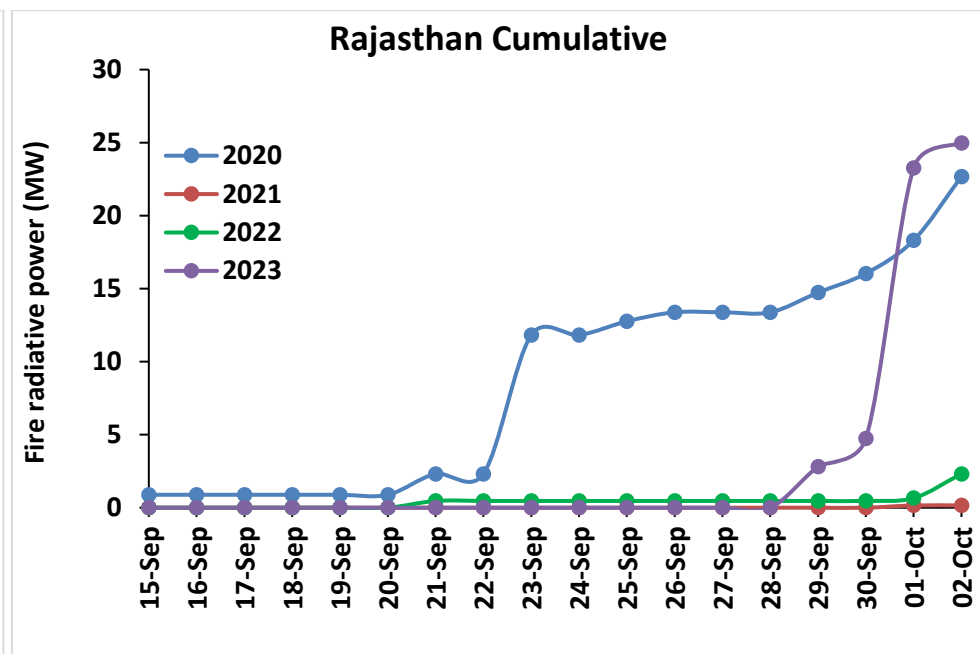
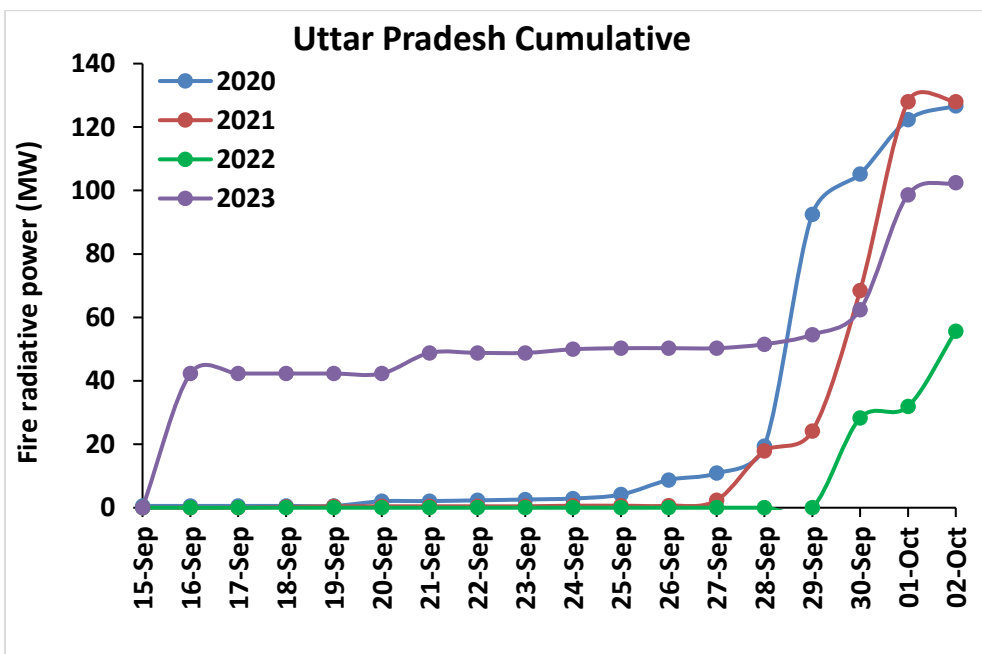
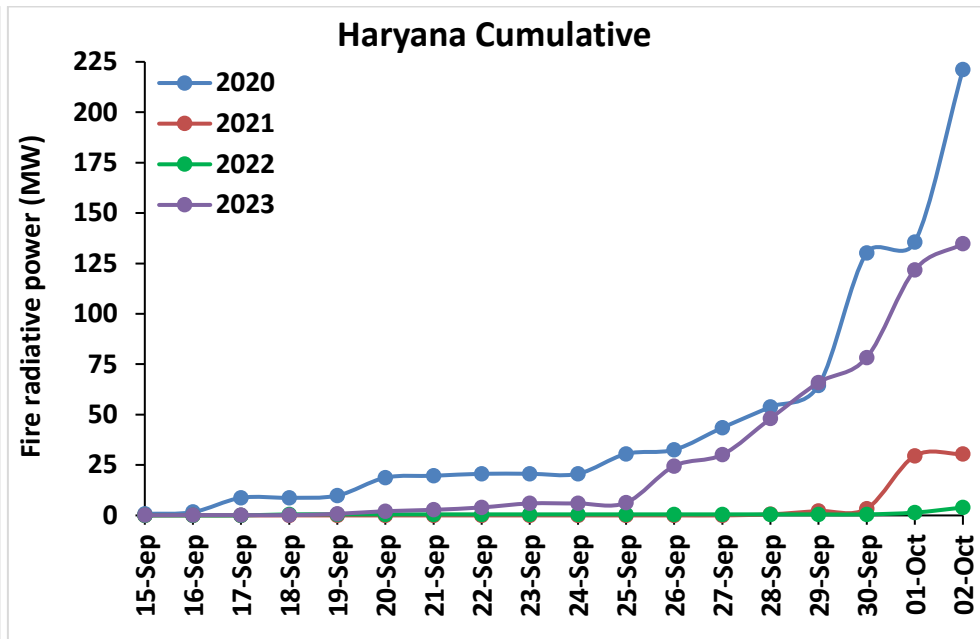
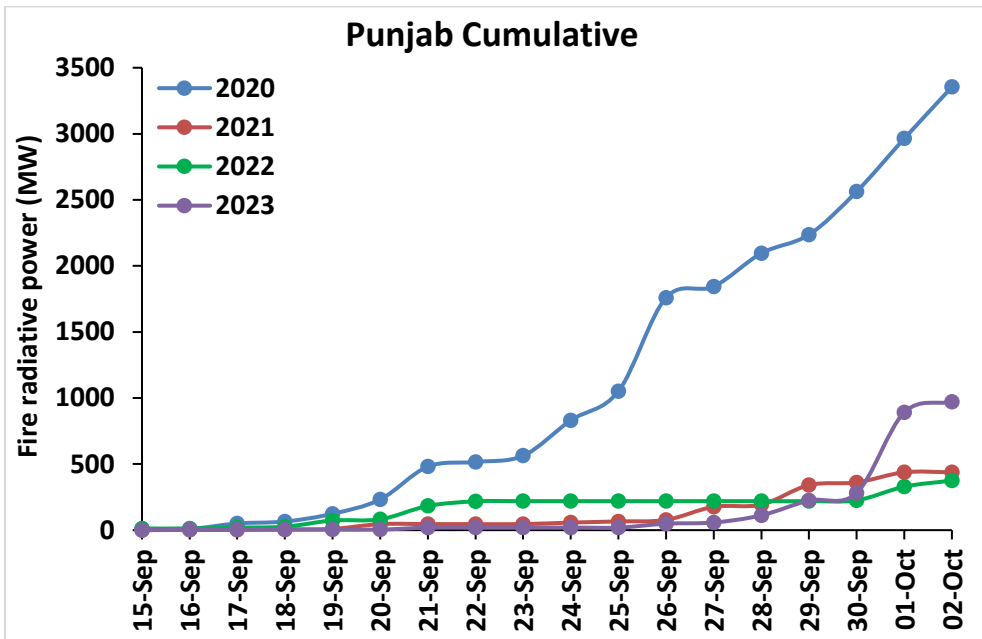
Madhya Pradesh Cumulative

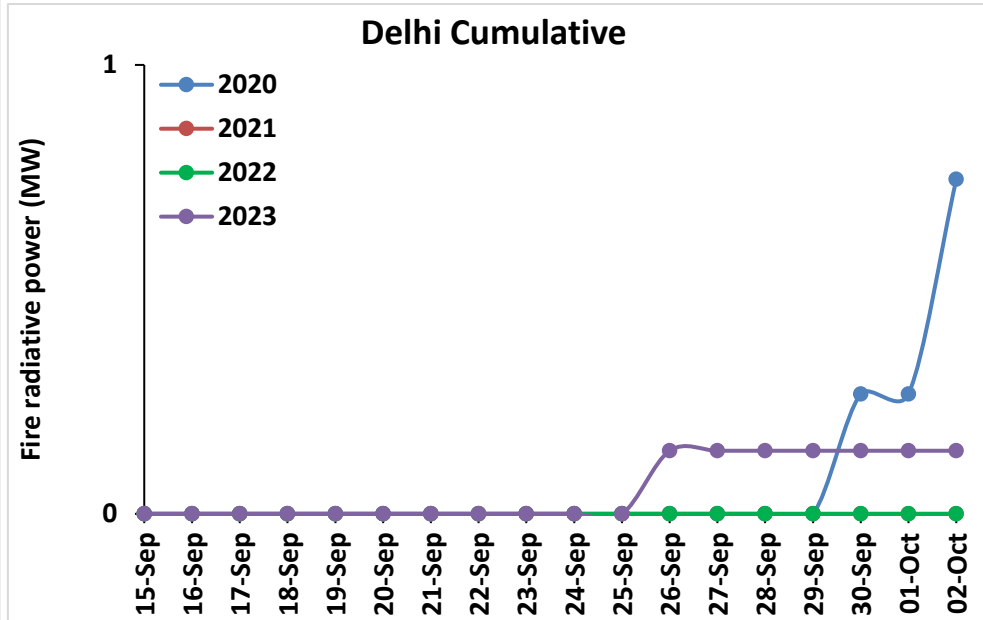
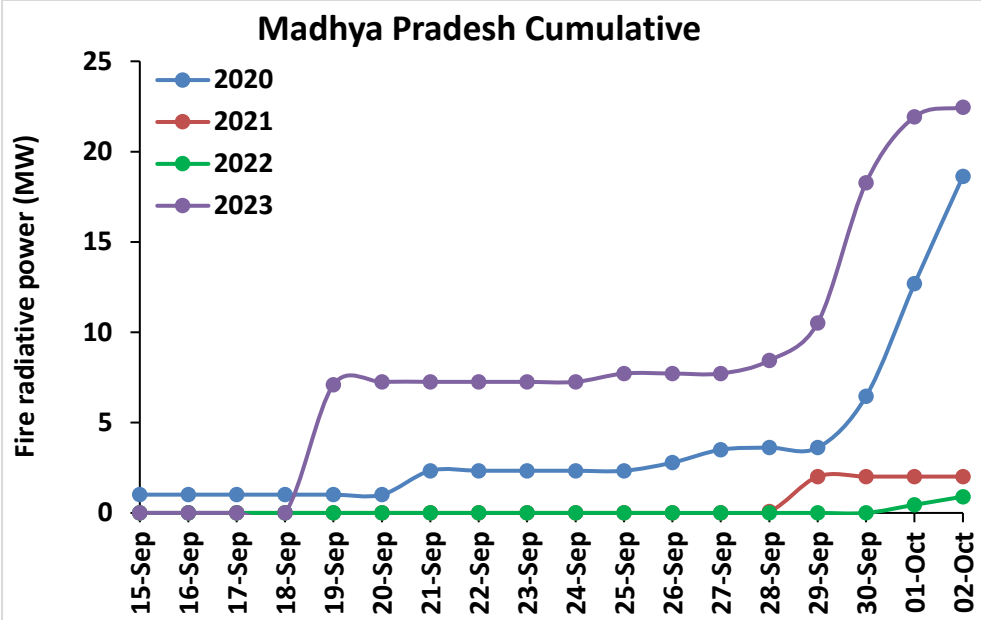


Delhi Cumulative



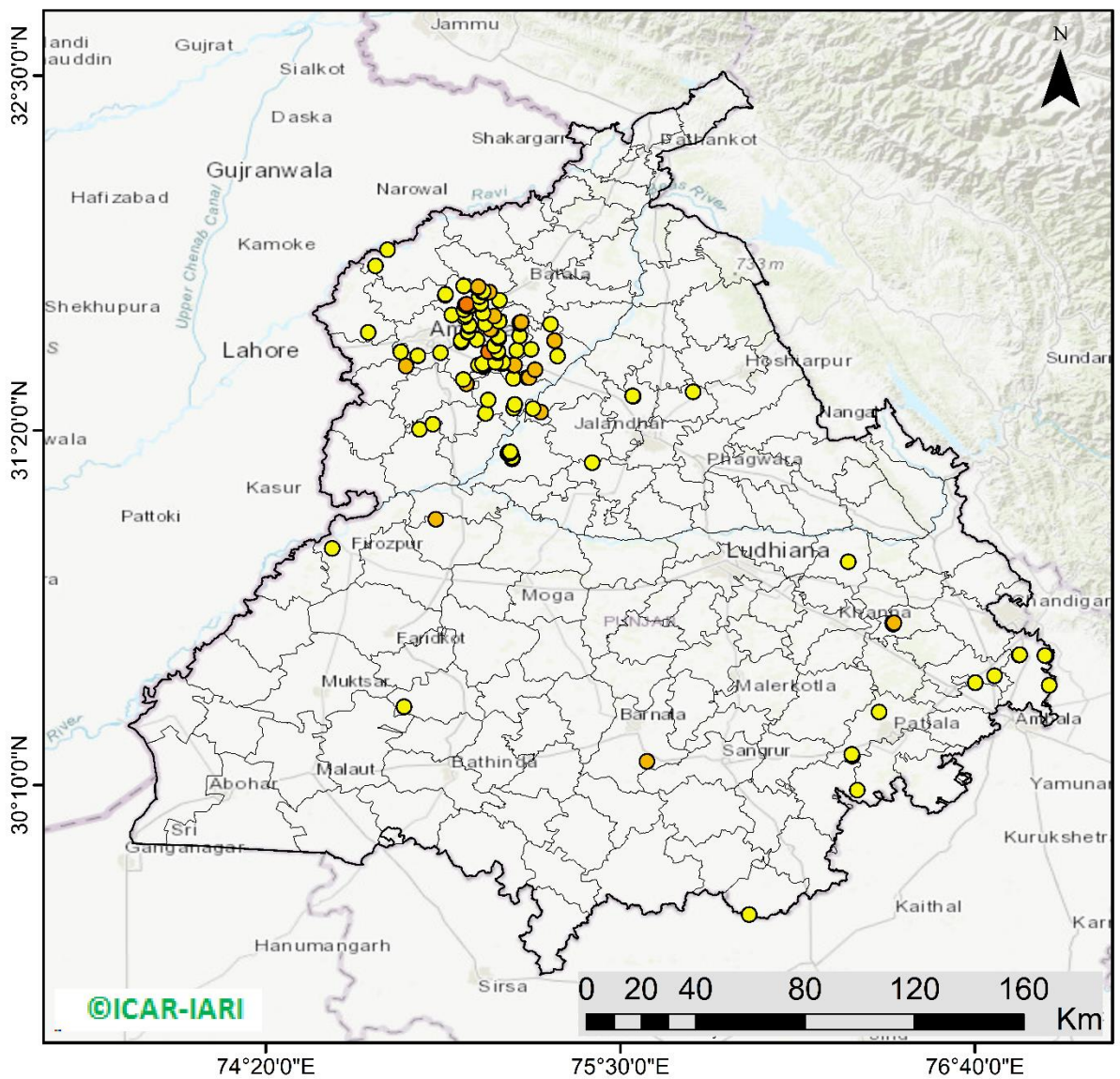
Comparison of residue burning fire power in current year (2023) with previous years (2020, 2021 and 2022) for the study States





Punjab

RICE RESIDUE BURNING IN PUNJAB



119 burning events detected in Punjab during (02nd Oct 2023)

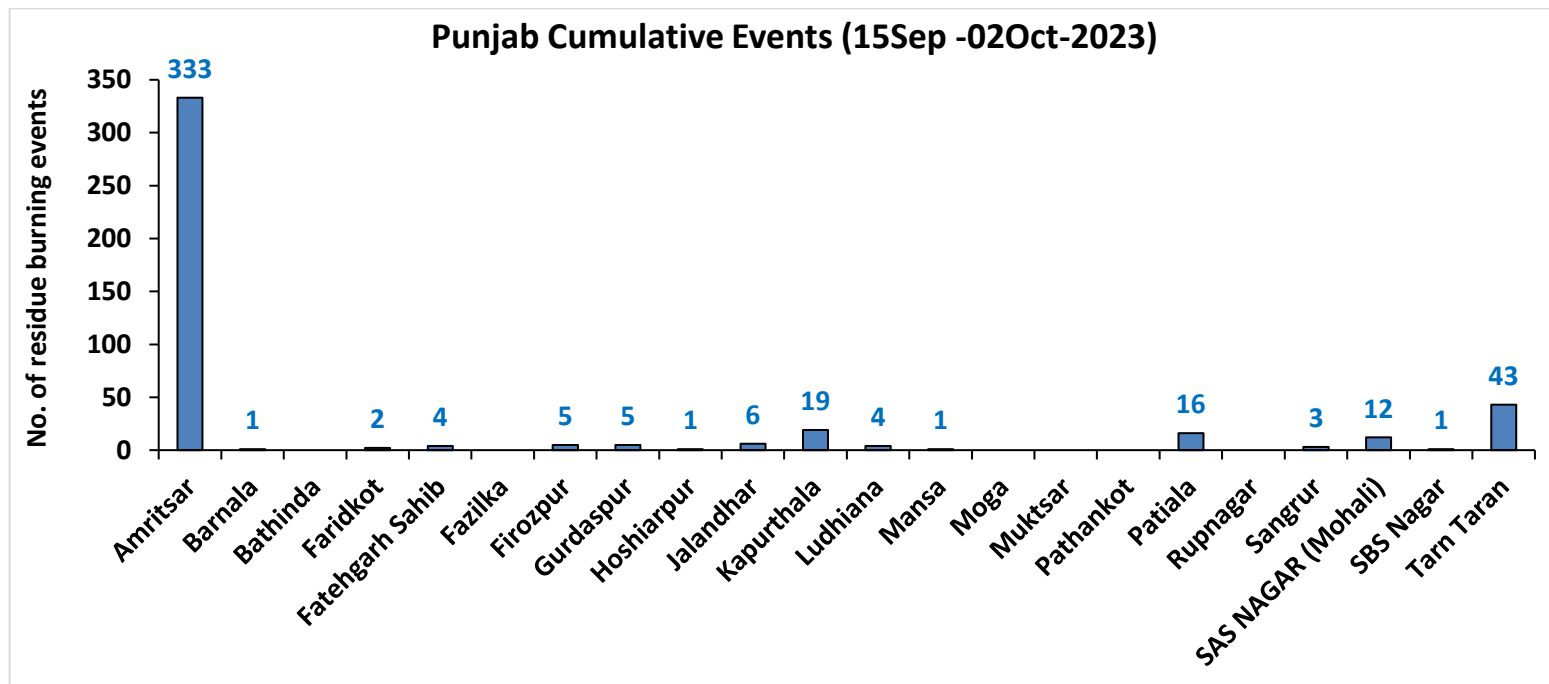
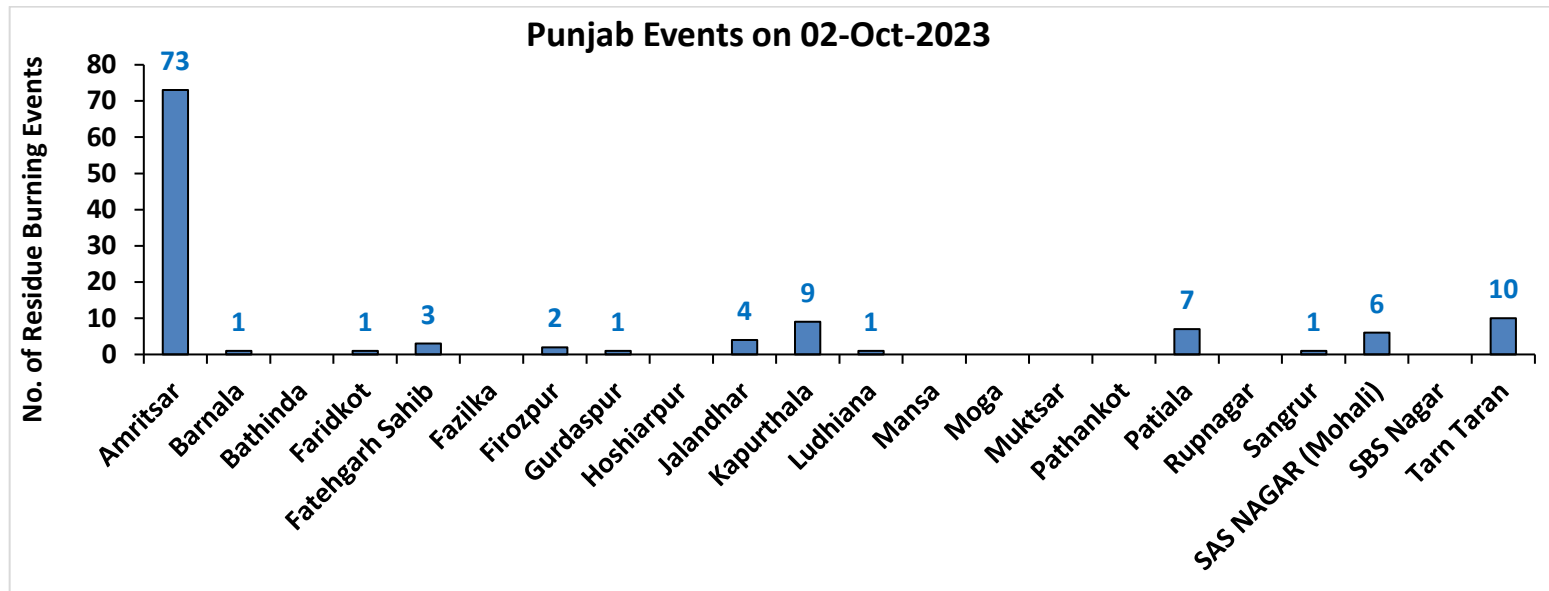
Fire Intensity (W/m²)

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



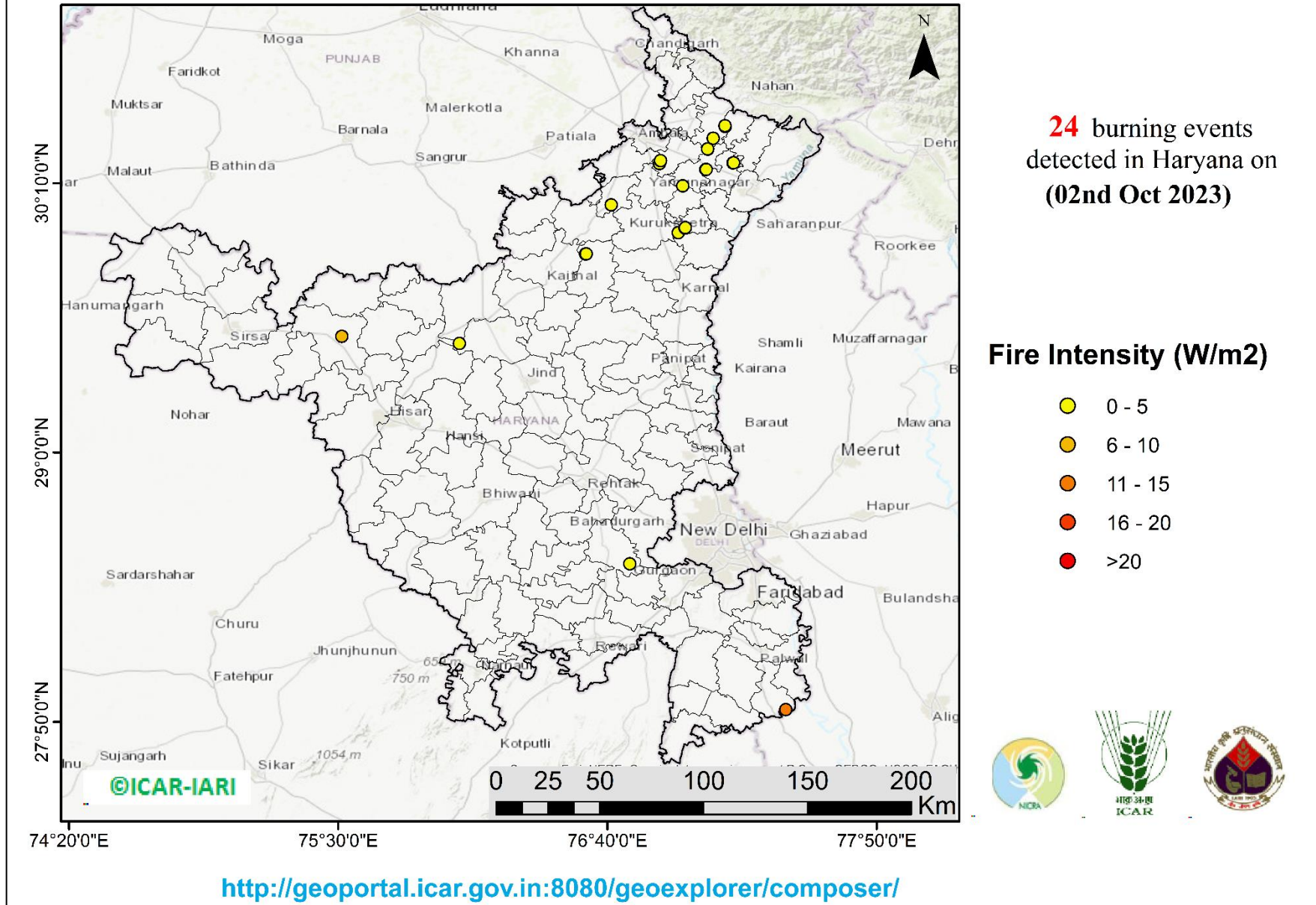
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 02Oct-2023)

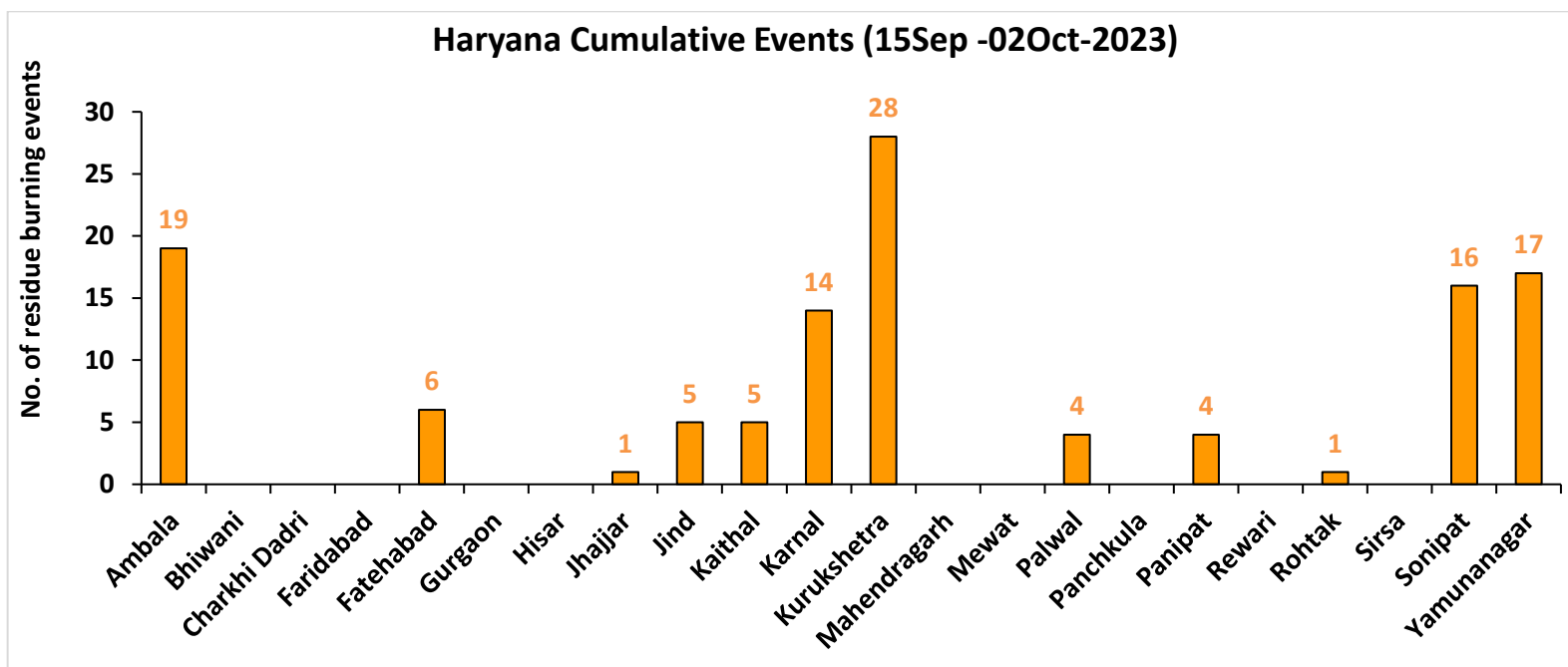
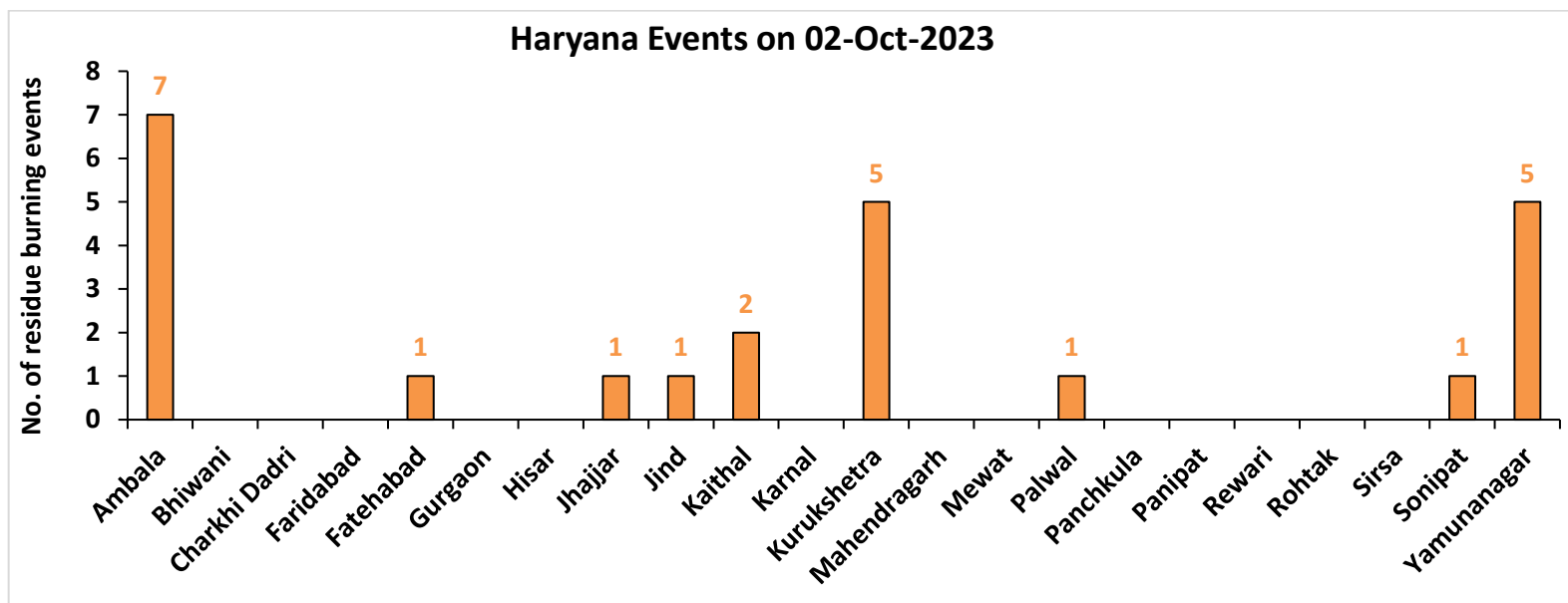


Haryana

RICE RESIDUE BURNING IN HARYANA

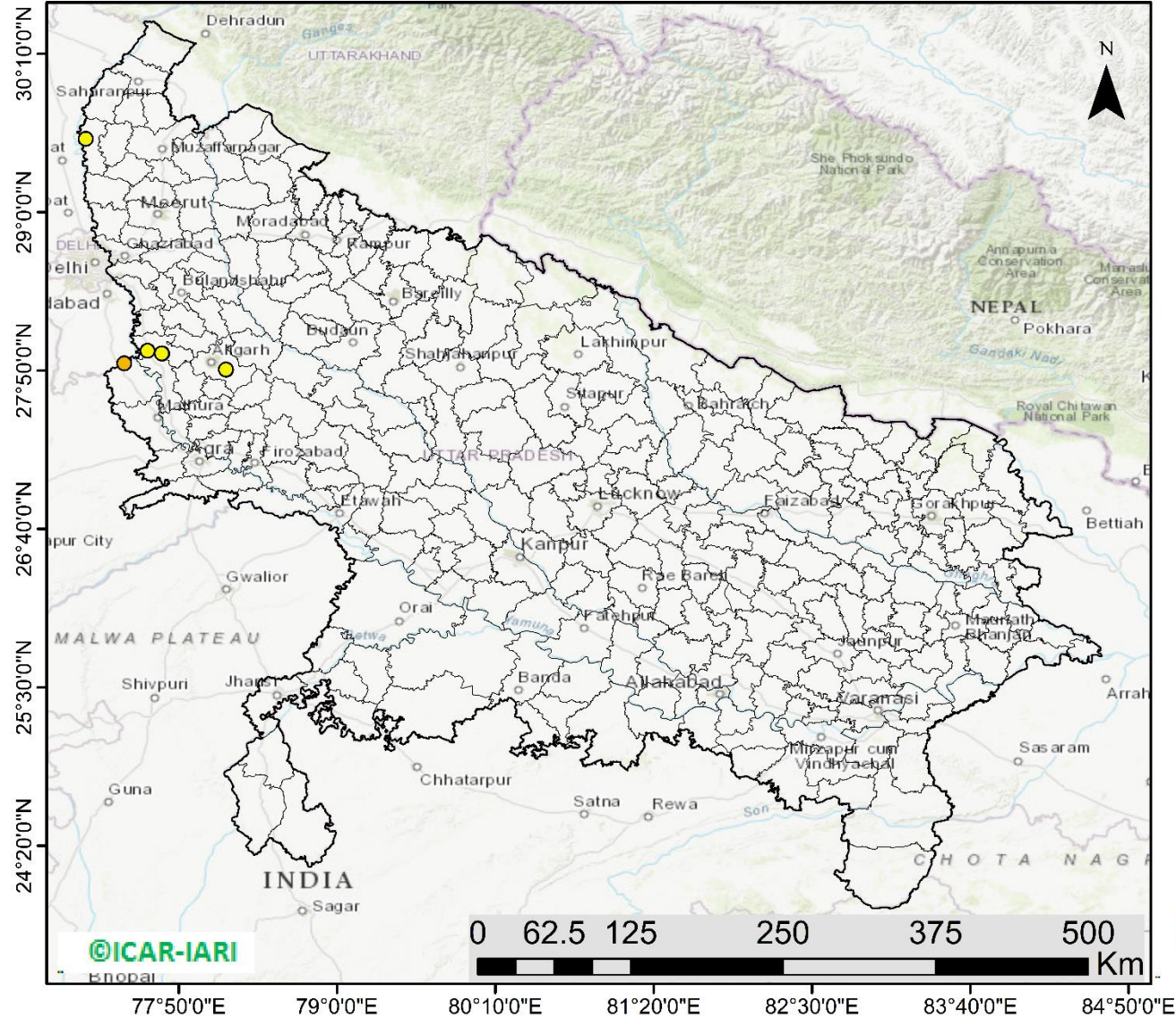


District-wise cumulative number of residues burning events in Haryana (15Sep-02Oct -2023)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



07 burning events detected in Uttar Pradesh on (02nd Oct 2023)

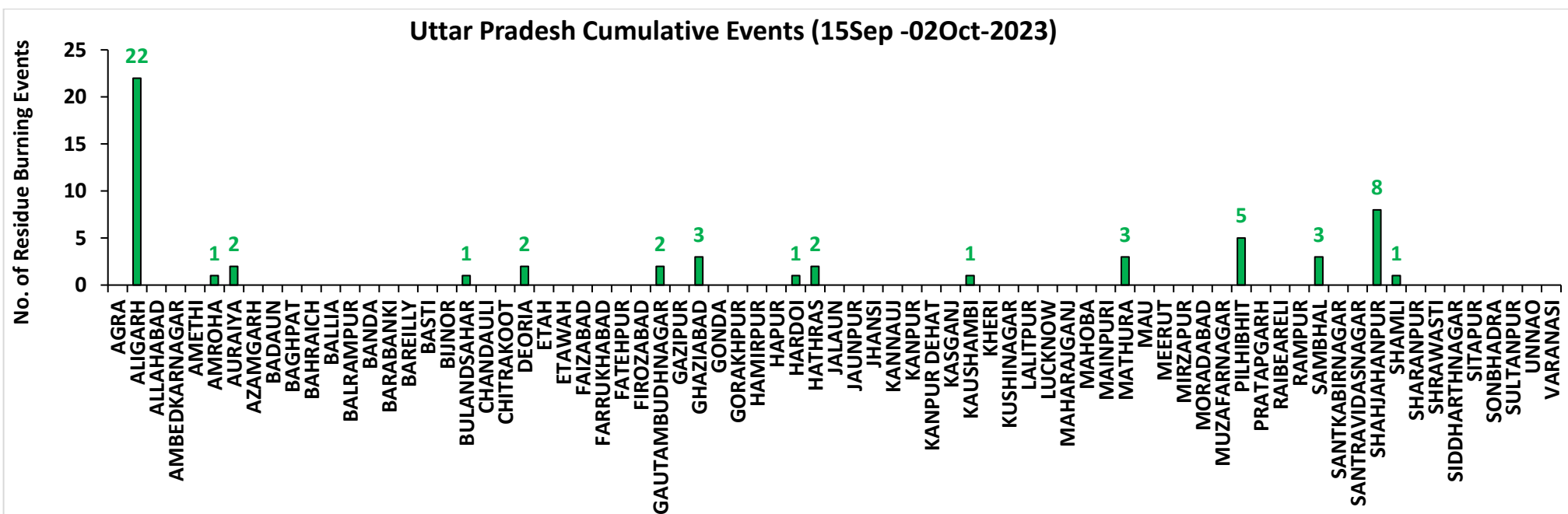
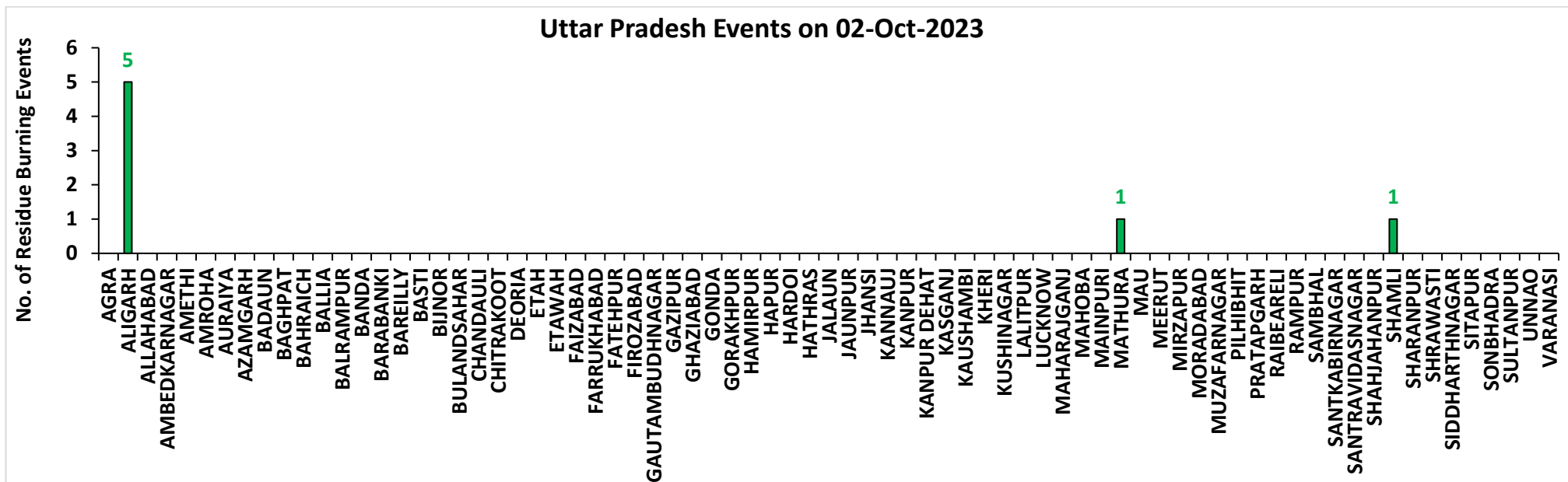
Fire Intensity (W/m2)

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



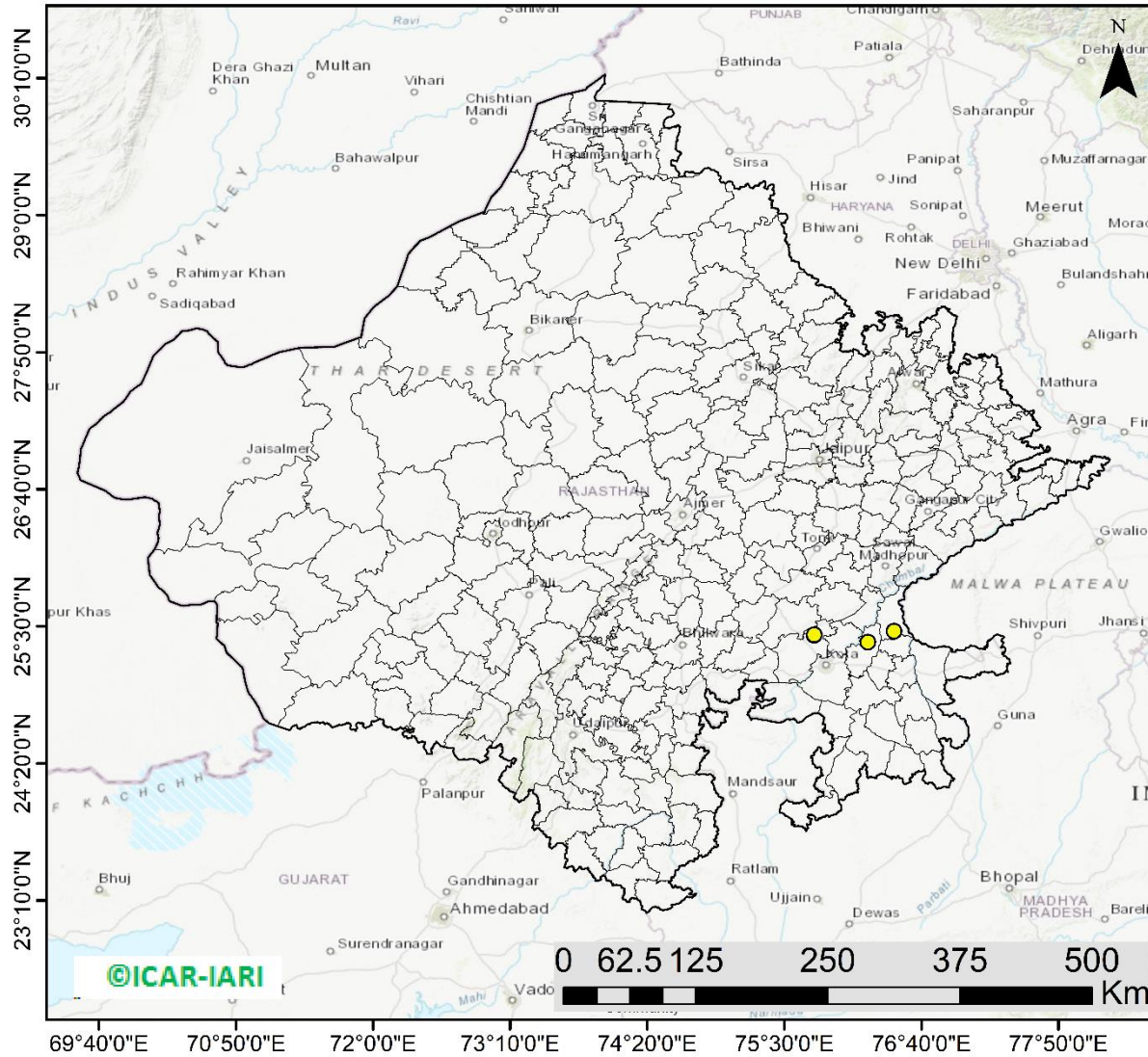
<http://geoportal.icar.gov.in:8080/geoplorer/composer/>

District-wise cumulative number of residues burning events in Uttar Pradesh (15Sep-02Oct -2023)



Rajasthan

RICE RESIDUE BURNING IN RAJASTHAN



04 burning events
detected in Rajasthan on
(02nd Oct 2023)

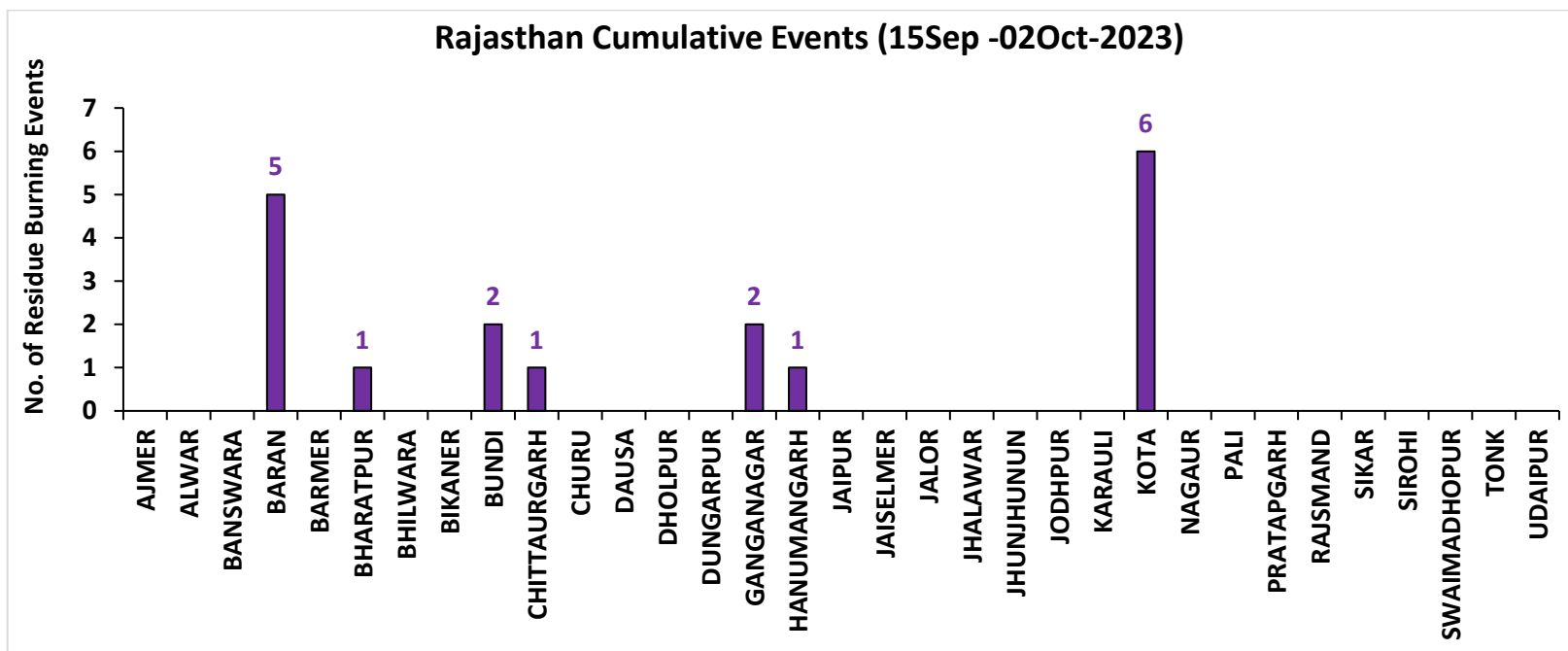
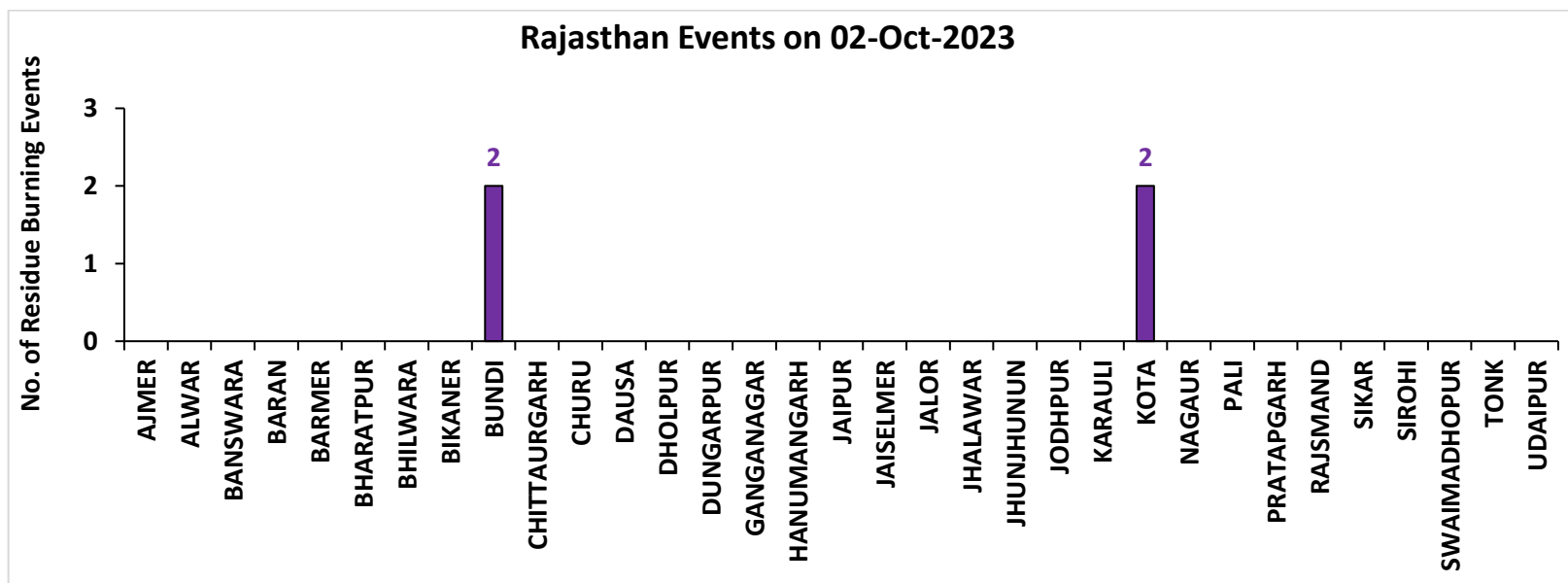
Fire Intensity (W/m²)

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



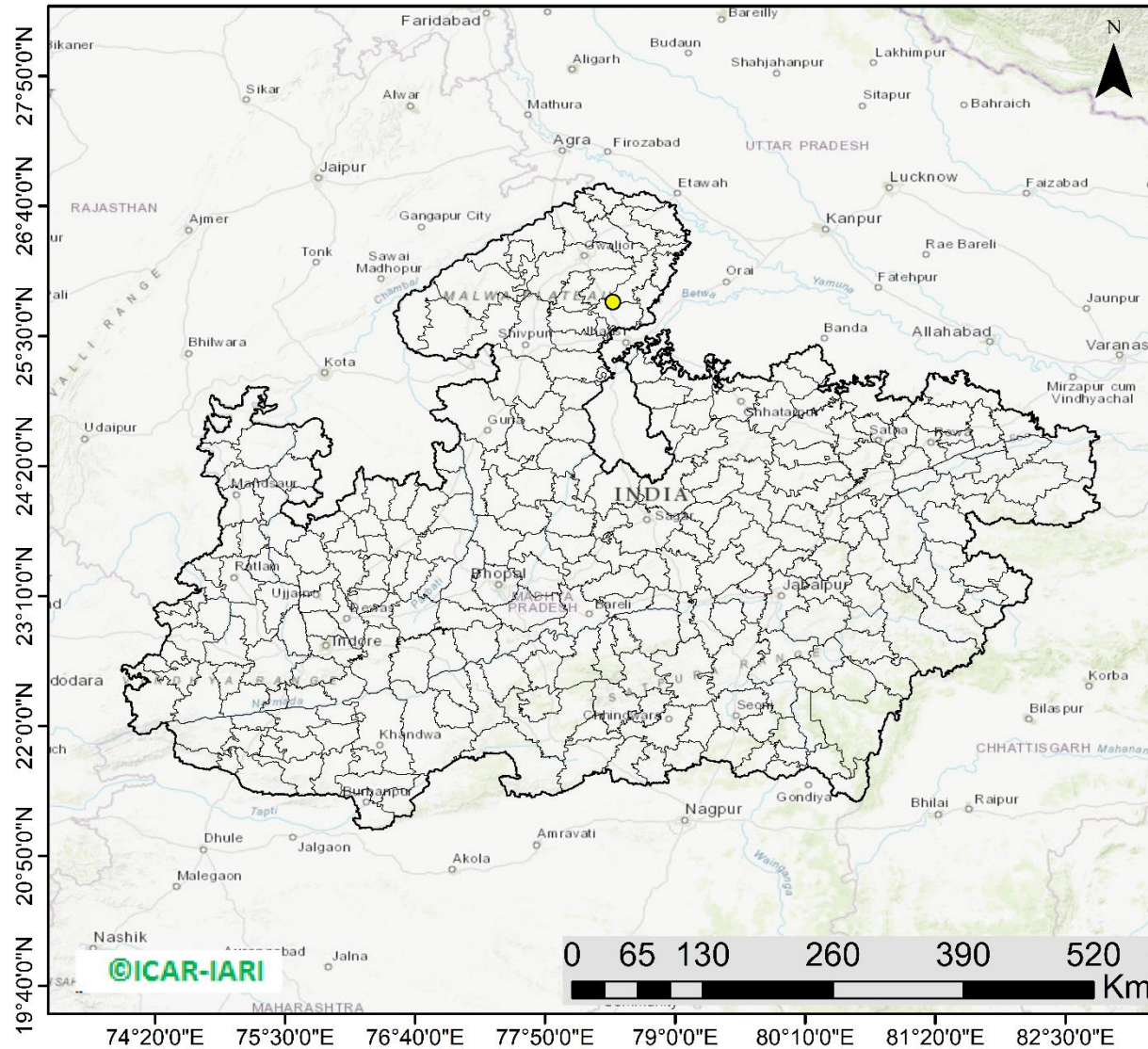
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Rajasthan (15Sep-02Oct -2023)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



01 burning events detected in MP on (02nd Oct 2023)

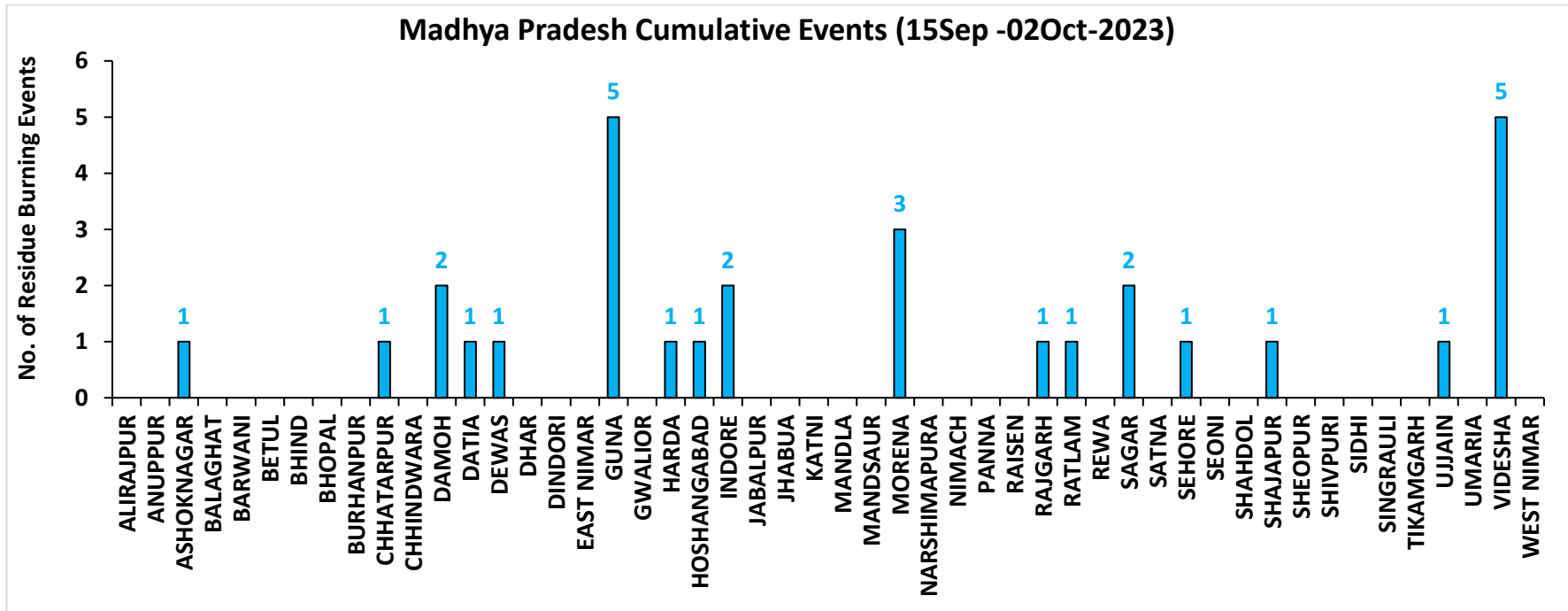
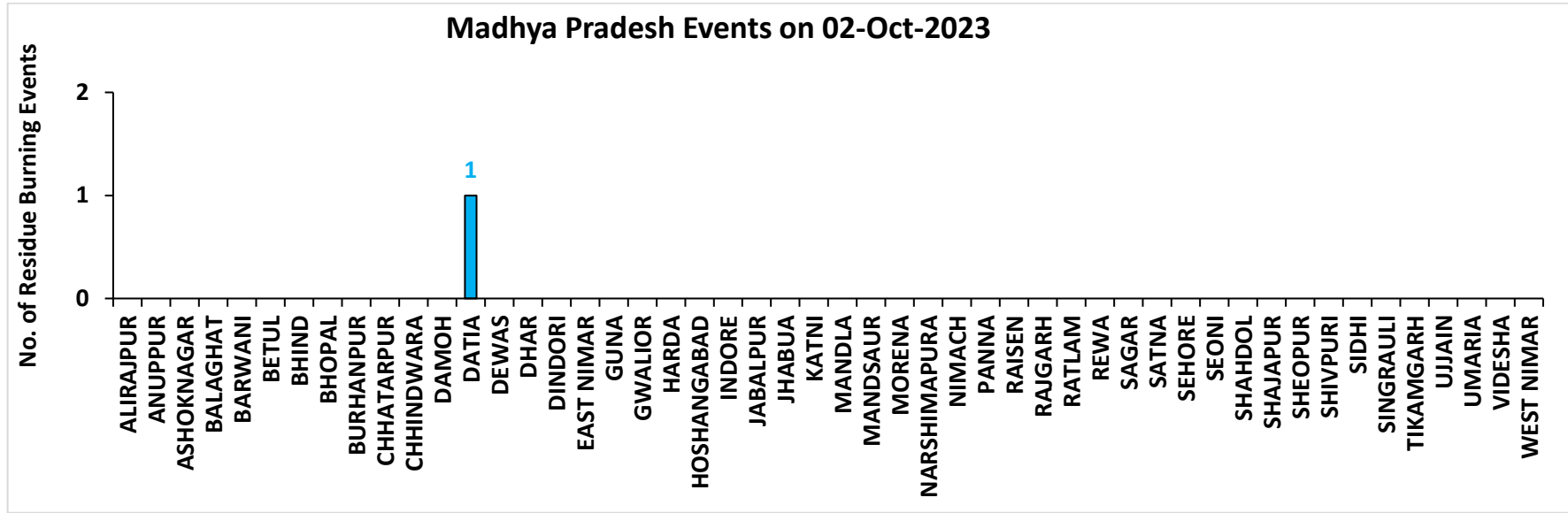
Fire Intensity (W/m²)

- 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 (15Sep-02Oct -2023)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022 and 2023
(Period: 15 September-02 October)

(a) Punjab

District	15 Sep-02 Oct			
	2020	2021	2022	2023
Amritsar	891	157	230	333
Barnala	2	0	0	1
Bathinda	0	0	0	0
Faridkot	3	9	0	2
Fatehgarh Sahib	12	0	1	4
Fazilka	0	1	0	0
Firozpur	12	3	3	5
Gurdaspur	44	4	3	5
Hoshiarpur	3	0	0	1
Jalandhar	11	1	2	6
Kapurthala	11	2	2	19
Ludhiana	30	7	0	4
Mansa	1	0	0	1
Moga	7	0	0	0
Muktsar	1	0	1	0
Pathankot	0	0	0	0
Patiala	46	10	4	16
Rupnagar	1	0	0	0
Sangrur	14	3	0	3
SAS NAGAR (Mohali)	7	0	1	12
SBS Nagar	2	0	1	1
Tarn Taran	233	31	27	43
Total	1331	228	275	456

(b) Haryana

District	15 Sep-02 Oct			
	2020	2021	2022	2023
AMBALA	17	0	1	19
BHIWANI	0	0	0	0
CHARKHI DADRI	0	0	0	0
FARIDABAD	0	0	0	0
FATEHABAD	12	0	1	6
GURGAON	0	0	0	0
HISAR	2	0	0	0
JHAJJAR	0	0	0	1
JIND	0	0	1	5
KAITHAL	15	2	1	5
KARNAL	35	2	3	14
KURUKSHETRA	27	8	2	28
MAHENDRAGARH	0	0	0	0
MEWAT	0	0	0	0
PALWAL	1	0	0	4
PANCHKULA	0	0	0	0
PANIPAT	6	0	0	4
REWARI	0	0	0	0
ROHTAK	0	0	0	1
SIRSA	1	0	0	0
SONIPAT	1	0	0	16
YAMUNANAGAR	6	1	0	17
Total	123	13	9	120

(c) Uttar Pradesh

District	15 Sep-02 Oct													
	2020	2021	2022	2023	GAUTAMBUDHNAGAR	1	0	0	2	MUZAFARNAGAR	0	0	0	0
AGRA	0	0	0	0	GAZIPUR	0	0	0	0	PILHIBHIT	1	1	1	5
ALIGARH	4	0	0	22	GHAZIABAD	1	0	1	3	PRATAPGARH	0	0	0	0
ALLAHABAD	0	0	0	0	GONDA	0	0	0	0	RAIBEARELI	1	0	0	0
AMBEDKARNAGAR	0	0	0	0	GORAKHPUR	0	0	0	0	RAMPUR	2	3	0	0
AMETHI	0	0	0	0	HAMIRPUR	0	0	0	0	SAMBHAL	5	0	3	3
AMROHA	0	0	0	1	HAPUR	1	0	0	0	SANTKABIRNAGAR	0	0	0	0
AURAIYA	10	0	4	2	HARDOI	0	0	0	1	SANTRAVIDASNAGAR	0	0	0	0
AZAMGARH	0	0	0	0	HATHRAS	0	0	0	2	SHAHJAHANPUR	5	36	28	8
BADAUN	0	0	0	0	JALAUN	0	0	0	0	SHAMLI	7	0	0	1
BAGHPAT	1	0	0	0	JAUNPUR	0	0	0	0	SHARANPUR	3	0	0	0
BAHRAICH	0	0	0	0	JHANSI	2	0	0	0	SHRAWASTI	0	0	0	0
BALLIA	0	0	0	0	KANNAUJ	1	0	0	0	SIDDHARTHANAGAR	0	0	0	0
BALRAMPUR	0	0	0	0	KANPUR	0	1	0	0	SITAPUR	1	0	0	0
BANDA	0	0	0	0	KANPUR DEHAT	1	0	0	0	SONBHADRA	0	0	0	0
BARABANKI	0	0	0	0	KASGANJ	0	0	0	0	SULTANPUR	0	0	0	0
BAREILLY	0	0	0	0	KAUSHAMBI	1	0	0	1	UNNAO	2	0	0	0
BASTI	0	0	0	0	KHERI	1	3	7	0	VARANASI	0	0	0	0
BIJNOR	1	0	1	0	KUSHINAGAR	0	0	0	0	Total	63	46	49	57
BULANDSAHAR	1	0	2	1	LALITPUR	0	1	2	0					
CHANDAULI	0	0	0	0	LUCKNOW	0	0	0	0					
CHITRAKOOT	0	0	0	0	MAHARAJGANJ	0	0	0	0					
DEORIA	0	0	0	2	MAHOBA	0	0	0	0					
ETAH	1	0	0	0	MAINPURI	0	0	0	0					
ETAWAH	0	0	0	0	MATHURA	2	1	0	3					
FAIZABAD	0	0	0	0	MAU	0	0	0	0					
FARRUKHABAD	0	0	0	0	MEERUT	6	0	0	0					
FATEHPUR	1	0	0	0	MIRZAPUR	0	0	0	0					
FIROZABAD	0	0	0	0	MORADABAD	0	0	0	0					

(d) Delhi

District	15 Sep-02 Oct			
	2020	2021	2022	2023
CENTRAL	0	0	0	0
EAST	0	0	0	0
NEW DELHI	0	0	0	0
NORTH	1	0	0	1
NORTH EAST	0	0	0	0
NORTH WEST DELHI	0	0	0	0
SHAHADRA	0	0	0	0
SOUTH	1	0	0	0
SOUTH EAST	0	0	0	0
SOUTH WEST DELHI	0	0	0	0
WEST DELHI	0	0	0	0
Total	2	0	0	1

(e) Rajasthan

District	15 Sep-02 Oct			
	2020	2021	2022	2023
AJMER	0	0	0	0
ALWAR	1	0	0	0
BANSWARA	0	0	0	0
BARAN	7	0	1	5
BARMER	2	0	0	0
BHARATPUR	0	0	0	1
BHILWARA	1	0	0	0
BIKANER	0	0	0	0
BUNDI	1	0	2	2
CHITTAURGARH	0	1	0	1
CHURU	0	0	0	0
DAUSA	0	0	0	0
DHOLPUR	0	0	0	0
DUNGARPUR	0	0	0	0
GANGANAGAR	1	0	0	2
HANUMANGARH	4	0	1	1
JAIPUR	0	0	0	0
JAISELMER	1	0	0	0
JALOR	0	0	0	0
JHALAWAR	0	0	0	0
JHUNJHUNUN	0	0	0	0
JODHPUR	1	0	0	0
KARALI	0	0	0	0
KOTA	0	0	1	6
NAGAU	0	0	0	0
PALI	1	0	0	0
PRATAPGARH	0	0	0	0
RAJSMAND	0	0	0	0
SIKAR	0	0	0	0
SIROHI	0	0	0	0
SWAIMADHOPUR	0	0	0	0
TONK	0	0	0	0
UDAIPUR	0	0	0	0
Total	20	1	5	18

(f) Madhya Pradesh

District	15 Sep-02 Oct								
	2020	2021	2022	2023					
					PANNA	0	0	0	0
ALIRAJPUR	0	0	0	0	RAISEN	0	0	0	0
ANUPPUR	0	0	0	0	RAJGARH	1	0	2	1
ASHOKNAGAR	5	0	0	1	RATLAM	0	0	0	1
BALAGHAT	0	0	0	0	REWA	0	0	0	0
BARWANI	0	0	0	0	SAGAR	2	2	0	2
BETUL	0	0	0	0	SATNA	1	0	0	0
BHIND	0	0	0	0	SEHORE	1	0	0	1
BHOPAL	1	0	0	0	SEONI	0	0	0	0
BURHANPUR	0	0	0	0	SHAHDOL	0	0	0	0
CHHATARPUR	0	0	0	1	SHAJAPUR	2	0	0	1
CHHINDWARA	0	0	0	0	SHEOPUR	0	0	0	0
DAMOH	5	0	0	2	SHIVPURI	0	0	0	0
DATIA	0	0	0	1	SIDHI	0	0	0	0
DEWAS	0	0	0	1	SINGRAULI	0	0	0	0
DHAR	2	0	0	0	TIKAMGARH	0	0	0	0
DINDORI	0	0	0	0	UJJAIN	3	0	0	1
EAST NIMAR	0	0	0	0	UMARIA	0	0	0	0
GUNA	4	1	0	5	VIDESHA	4	1	0	5
GWALIOR	3	0	0	0	WEST NIMAR	0	0	0	0
HARDA	2	1	0	1	Total	38	5	2	30
HOSHANGABAD	0	0	0	1					
INDORE	1	0	0	2					
JABALPUR	1	0	0	0					
JHABUA	0	0	0	0					
KATNI	0	0	0	0					
MANDLA	0	0	0	0					
MANDSAUR	0	0	0	0					
MORENA	0	0	0	3					
NARSHIMAPURA	0	0	0	0					
NIMACH	0	0	0	0					

State-wise and date-wise number of paddy residue burning events detected in 2020, 2021, 2022 and 2023
(Period: 15 September-02 October)

Number of Paddy Residue Burning Events Detected

Date	Punjab				Haryana				Uttar Pradesh			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
15-Sep	5	0	14	0	2	0	0	1	1	0	0	0
16-Sep	0	2	0	6	1	0	0	1	0	0	0	2
17-Sep	5	0	1	0	3	0	0	0	0	0	0	0
18-Sep	17	9	7	0	0	0	1	0	0	1	0	0
19-Sep	30	5	18	0	2	0	0	1	0	1	0	0
20-Sep	67	8	10	0	6	0	0	2	2	0	0	0
21-Sep	54	0	56	1	2	0	0	2	1	0	0	1
22-Sep	34	0	30	0	1	0	0	2	1	0	0	0
23-Sep	49	0	3	1	0	0	0	3	1	0	0	0
24-Sep	78	5	0	0	0	0	0	0	1	1	0	1
25-Sep	184	11	0	0	11	0	0	1	5	0	0	1
26-Sep	190	19	0	3	5	0	0	2	8	0	0	0
27-Sep	78	37	0	21	8	0	0	9	4	1	0	0
28-Sep	55	28	0	33	6	1	0	8	1	6	0	4
29-Sep	63	64	0	68	9	4	0	17	6	10	0	6
30-Sep	116	27	8	81	22	2	0	26	13	13	10	18
01-Oct	165	13	45	123	15	4	1	21	7	13	3	17
02-Oct	141	0	83	119	30	2	7	24	12	0	36	7
Total	1331	228	275	456	123	13	9	120	63	46	49	57

Number of Paddy Residue Burning Events Detected

Date	Delhi				Rajasthan				Madhya Pradesh			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
15-Sep	0	0	0	0	1	0	0	0	2	0	0	0
16-Sep	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	0	0	0	0	0	0	0	0	0	0	0	0
18-Sep	0	0	0	0	0	0	0	0	0	0	0	0
19-Sep	0	0	0	0	0	0	0	0	0	0	0	1
20-Sep	0	0	0	0	0	0	0	0	0	0	0	1
21-Sep	0	0	0	0	1	0	1	0	2	0	0	0
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0
23-Sep	0	0	0	0	1	0	0	0	0	0	0	0
24-Sep	0	0	0	0	0	0	0	0	0	0	0	0
25-Sep	0	0	0	0	1	0	0	0	0	0	0	1
26-Sep	0	0	0	1	1	0	0	0	2	0	0	0
27-Sep	0	0	0	0	0	0	0	0	1	0	0	0
28-Sep	0	0	0	0	0	0	0	0	1	1	0	2
29-Sep	0	0	0	0	3	0	0	6	0	4	0	5
30-Sep	1	0	0	0	1	0	0	4	5	0	0	11
01-Oct	0	0	0	0	4	1	1	4	13	0	1	8
02-Oct	1	0	0	0	7	0	3	4	12	0	1	1
Total	2	0	0	1	20	1	5	18	38	5	2	30

Details of residue burning events in Punjab on 02-Oct-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	31.87388	74.69417	12:39:27	D	3.10
2	AMRITSAR	AJNALA	S-NPP	31.92698	74.73402	14:19:44	D	3.10
3	AMRITSAR	ATTARI	S-NPP	31.57812	74.83342	14:19:44	D	3.80
4	AMRITSAR	ATTARI	S-NPP	31.58842	74.90799	14:19:44	D	3.40
5	AMRITSAR	ATTARI	S-NPP	31.59099	74.77770	12:39:27	D	2.70
6	AMRITSAR	CHOGAWAN	S-NPP	31.65491	74.66998	14:19:44	D	2.70
7	AMRITSAR	JANDIALA GURU	S-NPP	31.54224	75.04898	14:19:44	D	2.00
8	AMRITSAR	JANDIALA GURU	S-NPP	31.54487	75.04884	12:39:27	D	4.70
9	AMRITSAR	JANDIALA GURU	S-NPP	31.54603	75.04671	14:19:44	D	6.00
10	AMRITSAR	JANDIALA GURU	S-NPP	31.54616	75.05379	12:39:27	D	4.70
11	AMRITSAR	JANDIALA GURU	S-NPP	31.54741	75.03313	14:19:44	D	4.00
12	AMRITSAR	JANDIALA GURU	S-NPP	31.54824	75.04854	14:19:44	D	6.80
13	AMRITSAR	JANDIALA GURU	S-NPP	31.55158	75.11034	14:19:44	D	2.90
14	AMRITSAR	JANDIALA GURU	S-NPP	31.55203	75.04632	14:19:44	D	2.90
15	AMRITSAR	JANDIALA GURU	S-NPP	31.55607	75.11317	14:19:44	D	2.80
16	AMRITSAR	JANDIALA GURU	S-NPP	31.55648	75.08926	14:19:44	D	2.90
17	AMRITSAR	JANDIALA GURU	S-NPP	31.58716	75.09745	14:19:44	D	3.80
18	AMRITSAR	JANDIALA GURU	S-NPP	31.59145	75.06607	14:19:44	D	10.70
19	AMRITSAR	JANDIALA GURU	S-NPP	31.59319	75.09702	14:19:44	D	3.80
20	AMRITSAR	JANDIALA GURU	S-NPP	31.62242	74.97662	14:19:44	D	2.50
21	AMRITSAR	JANDIALA GURU	S-NPP	31.62429	74.97739	14:19:44	D	5.00
22	AMRITSAR	JANDIALA GURU	S-NPP	31.62841	74.97620	14:19:44	D	2.70
23	AMRITSAR	JANDIALA GURU	S-NPP	31.63135	75.02818	12:39:27	D	3.50
24	AMRITSAR	JANDIALA GURU	S-NPP	31.65506	74.99804	12:39:27	D	2.80
25	AMRITSAR	JANDIALA GURU	S-NPP	31.65766	74.99878	12:39:27	D	3.90
26	AMRITSAR	JANDIALA GURU	S-NPP	31.67499	75.00182	12:39:27	D	2.70
27	AMRITSAR	JANDIALA GURU	S-NPP	31.67765	75.00259	12:39:27	D	4.80
28	AMRITSAR	MAJITHA	S-NPP	31.68274	75.05544	14:19:44	D	3.90
29	AMRITSAR	MAJITHA	S-NPP	31.70524	74.98740	12:39:27	D	2.30
30	AMRITSAR	MAJITHA	S-NPP	31.70855	75.08476	14:19:44	D	5.90

31	AMRITSAR	MAJITHA	S-NPP	31.71233	74.99030	12:39:27	D	3.00
32	AMRITSAR	MAJITHA	S-NPP	31.71853	75.04774	14:19:44	D	4.90
33	AMRITSAR	MAJITHA	S-NPP	31.72922	74.98509	14:19:44	D	4.60
34	AMRITSAR	MAJITHA	S-NPP	31.74016	75.00498	14:19:44	D	7.30
35	AMRITSAR	MAJITHA	S-NPP	31.74176	74.99445	14:19:44	D	14.80
36	AMRITSAR	MAJITHA	S-NPP	31.74230	75.00470	14:19:44	D	7.80
37	AMRITSAR	MAJITHA	S-NPP	31.74525	74.98923	14:19:44	D	13.90
38	AMRITSAR	MAJITHA	S-NPP	31.74555	74.99435	14:19:44	D	13.90
39	AMRITSAR	MAJITHA	S-NPP	31.74775	74.99402	14:19:44	D	14.80
40	AMRITSAR	MAJITHA	S-NPP	31.74829	75.04051	14:19:44	D	4.00
41	AMRITSAR	MAJITHA	S-NPP	31.75022	75.04025	14:19:44	D	4.30
42	AMRITSAR	MAJITHA	S-NPP	31.77213	75.03574	12:39:27	D	3.60
43	AMRITSAR	MAJITHA	S-NPP	31.77707	74.92367	12:39:27	D	1.50
44	AMRITSAR	MAJITHA	S-NPP	31.78040	74.92451	12:39:27	D	4.00
45	AMRITSAR	MAJITHA	S-NPP	31.78757	75.04636	12:39:27	D	3.00
46	AMRITSAR	MAJITHA	S-NPP	31.78800	75.06866	14:19:44	D	5.50
47	AMRITSAR	MAJITHA	S-NPP	31.79063	75.04882	12:39:27	D	2.80
48	AMRITSAR	MAJITHA	S-NPP	31.80222	75.03046	12:39:27	D	9.00
49	AMRITSAR	MAJITHA	S-NPP	31.80533	75.03281	12:39:27	D	10.00
50	AMRITSAR	MAJITHA	S-NPP	31.80744	74.98461	14:19:44	D	3.30
51	AMRITSAR	RAYYA	S-NPP	31.50624	75.19475	14:19:44	D	4.00
52	AMRITSAR	RAYYA	S-NPP	31.50654	75.19998	14:19:44	D	7.20
53	AMRITSAR	RAYYA	S-NPP	31.53197	75.21925	14:19:44	D	7.00
54	AMRITSAR	RAYYA	S-NPP	31.54616	75.15022	14:19:44	D	16.70
55	AMRITSAR	RAYYA	S-NPP	31.54748	75.14705	14:19:44	D	9.30
56	AMRITSAR	RAYYA	S-NPP	31.54775	75.15225	14:19:44	D	9.30
57	AMRITSAR	RAYYA	S-NPP	31.57730	75.29338	12:39:27	D	2.50
58	AMRITSAR	RAYYA	S-NPP	31.59927	75.20628	14:19:44	D	3.00
59	AMRITSAR	RAYYA	S-NPP	31.62797	75.28370	14:19:44	D	8.20
60	AMRITSAR	RAYYA	S-NPP	31.68224	75.27058	14:19:44	D	2.10
61	AMRITSAR	TARSIKKA	S-NPP	31.59649	75.15858	12:39:27	D	5.00
62	AMRITSAR	TARSIKKA	S-NPP	31.61067	75.08543	14:19:44	D	3.10
63	AMRITSAR	TARSIKKA	S-NPP	31.63566	75.09921	14:19:44	D	3.30

64	AMRITSAR	TARSIKKA	S-NPP	31.63679	75.10017	14:19:44	D	4.50
65	AMRITSAR	TARSIKKA	S-NPP	31.64168	75.09880	14:19:44	D	3.30
66	AMRITSAR	TARSIKKA	S-NPP	31.64310	75.16880	12:39:27	D	4.90
67	AMRITSAR	TARSIKKA	S-NPP	31.66455	75.07654	14:19:44	D	7.40
68	AMRITSAR	TARSIKKA	S-NPP	31.66553	75.07216	14:19:44	D	6.00
69	AMRITSAR	TARSIKKA	S-NPP	31.68295	75.17004	14:19:44	D	5.30
70	AMRITSAR	TARSIKKA	S-NPP	31.68704	75.16924	12:39:27	D	5.20
71	AMRITSAR	TARSIKKA	S-NPP	31.68830	75.17410	12:39:27	D	8.10
72	AMRITSAR	TARSIKKA	S-NPP	31.69133	75.10154	14:19:44	D	2.90
73	AMRITSAR	VERKA	S-NPP	31.71262	74.94553	14:19:44	D	1.80
74	BARNALA	BARNALA	S-NPP	30.24410	75.58782	14:19:44	D	6.70
75	FARIDKOT	JAITON	S-NPP	30.42373	74.78815	14:19:44	D	4.40
76	FATEHGARH SAHIB	BASSI PATHANAN	S-NPP	30.69567	76.39781	12:39:27	D	5.30
77	FATEHGARH SAHIB	BASSI PATHANAN	S-NPP	30.69877	76.39637	12:39:27	D	3.20
78	FATEHGARH SAHIB	BASSI PATHANAN	S-NPP	30.69985	76.40071	12:39:27	D	5.10
79	FIROZPUR	FIROZPUR	S-NPP	30.94444	74.55153	14:19:44	D	2.50
80	FIROZPUR	ZIRA	S-NPP	31.04060	74.89265	14:19:44	D	5.20
81	GURDASPUR	BATALA	S-NPP	31.76062	75.10226	12:39:27	D	2.30
82	JALANDHAR	ADAMPUR	S-NPP	31.45970	75.73959	12:39:27	D	2.00
83	JALANDHAR	JALANDHAR WEST	S-NPP	31.44492	75.54244	14:19:44	D	3.00
84	JALANDHAR	JALANDHAR WEST	S-NPP	31.44629	75.54050	14:19:44	D	2.40
85	JALANDHAR	NAKODAR	S-NPP	31.22680	75.40713	12:39:27	D	2.80
86	KAPURTHALA	DHILWAN	S-NPP	31.39262	75.23827	14:19:44	D	5.10
87	KAPURTHALA	DHILWAN	S-NPP	31.40452	75.21285	12:39:27	D	3.40
88	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.23876	75.14342	14:19:44	D	2.80
89	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.24042	75.14476	14:19:44	D	7.00
90	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.24478	75.14301	14:19:44	D	3.50
91	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.25667	75.12989	12:39:27	D	6.80
92	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.25931	75.13982	12:39:27	D	11.60
93	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.26090	75.13221	12:39:27	D	4.40
94	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.26219	75.13718	12:39:27	D	4.40
95	LUDHIANA	MACHHIWARA	S-NPP	30.90075	76.25015	12:39:27	D	4.50
96	PATIALA	PATIALA	S-NPP	30.26138	76.26345	12:39:27	D	4.60

97	PATIALA	PATIALA	S-NPP	30.26698	76.26160	12:39:27	D	4.60
98	PATIALA	PATIALA	S-NPP	30.40675	76.35154	12:39:27	D	3.20
99	PATIALA	RAJPURA	S-NPP	30.52543	76.73143	12:39:27	D	2.80
100	PATIALA	SANAU	S-NPP	30.14940	76.28008	12:39:27	D	2.50
101	PATIALA	SHAMBU KALAN	S-NPP	30.50246	76.66822	14:19:44	D	4.90
102	PATIALA	SHAMBU KALAN	S-NPP	30.50320	76.66841	14:19:44	D	3.80
103	SANGRUR	ANDANA	S-NPP	29.74006	75.92406	12:39:27	D	2.50
104	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.49391	76.91160	12:39:27	D	3.30
105	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.49424	76.91158	12:39:27	D	4.20
106	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.59096	76.90218	14:19:44	D	5.20
107	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.59241	76.89732	14:19:44	D	2.90
108	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.59361	76.81251	14:19:44	D	3.90
109	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.59485	76.81422	14:19:44	D	4.90
110	TARN TARAN	GANDIWIND TATLA	S-NPP	31.54415	74.79446	12:39:27	D	7.70
111	TARN TARAN	KHADUR SAHIB	S-NPP	31.38837	75.05669	14:19:44	D	3.40
112	TARN TARAN	KHADUR SAHIB	S-NPP	31.40573	75.14841	14:19:44	D	2.40
113	TARN TARAN	KHADUR SAHIB	S-NPP	31.41809	75.15263	14:19:44	D	3.50
114	TARN TARAN	KHADUR SAHIB	S-NPP	31.43287	75.06464	12:39:27	D	3.70
115	TARN TARAN	KHADUR SAHIB	S-NPP	31.50360	75.14796	14:19:44	D	2.70
116	TARN TARAN	PATTI	S-NPP	31.33633	74.83900	14:19:44	D	2.70
117	TARN TARAN	PATTI	S-NPP	31.35328	74.88313	12:39:27	D	4.20
118	TARN TARAN	TARN TARAN	S-NPP	31.48596	74.99337	12:39:27	D	5.40
119	TARN TARAN	TARN TARAN	S-NPP	31.50015	74.98343	14:19:44	D	4.90

Details of residue burning events in Haryana on 02-Oct-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMBALA	BARARA	S-NPP	30.22539	77.09281	12:39:27	D	4.80
2	AMBALA	NARAINGARH	S-NPP	30.36097	77.12505	12:39:27	D	4.50
3	AMBALA	SAHA	S-NPP	30.25115	76.89216	12:39:27	D	3.90
4	AMBALA	SAHA	S-NPP	30.26353	76.89700	12:39:27	D	4.10
5	AMBALA	SAHA	S-NPP	30.26403	76.89696	12:39:27	D	3.90
6	AMBALA	SAHA	S-NPP	30.31377	77.10136	12:39:27	D	3.30
7	AMBALA	SAHA	S-NPP	30.31454	77.10081	12:39:27	D	3.50
8	FATEHABAD	FATEHABAD	S-NPP	29.50275	75.51598	14:19:44	D	5.30
9	JHAJJAR	JHAJJAR	S-NPP	28.51784	76.76377	01:29:27	N	0.40
10	JIND	UCHANA	S-NPP	29.47190	76.02534	14:19:44	D	5.00
11	KAITHAL	PUNDRI	S-NPP	29.85956	76.57204	14:19:44	D	1.80
12	KAITHAL	PUNDRI	S-NPP	29.85999	76.57464	14:19:44	D	2.80
13	KURUKSHETRA	BABAIN	S-NPP	30.15451	76.99273	14:19:44	D	3.10
14	KURUKSHETRA	ISMALABAD	S-NPP	30.07238	76.68303	12:39:27	D	4.60
15	KURUKSHETRA	LADWA	S-NPP	29.95193	76.97354	14:19:44	D	2.90
16	KURUKSHETRA	LADWA	S-NPP	29.97169	77.00276	14:19:44	D	5.90
17	KURUKSHETRA	LADWA	S-NPP	29.97336	77.00450	14:19:44	D	5.00
18	PALWAL	HODAL	S-NPP	27.88611	77.43931	14:19:44	D	10.80
19	SONIPAT	RAI	S-NPP	28.84678	77.14709	01:29:27	N	0.30
20	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.22542	77.09487	12:39:27	D	3.40
21	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.25415	77.21095	12:39:27	D	2.50
22	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.25437	77.21329	12:39:27	D	3.10
23	YAMUNANAGAR	SADHAURA	S-NPP	30.41159	77.17751	14:19:44	D	3.20
24	YAMUNANAGAR	SADHAURA	S-NPP	30.41523	77.17604	14:19:44	D	3.50

Details of residue burning events in Uttar Pradesh on 02-Oct-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	ALIGARH	KHAIR	S-NPP	27.95731	77.71207	12:39:27	D	5.90
2	ALIGARH	KHAIR	S-NPP	27.95887	77.70966	12:39:27	D	4.20
3	ALIGARH	KHAIR	S-NPP	27.97810	77.60376	12:39:27	D	4.00
4	ALIGARH	KOL	S-NPP	27.83895	78.18240	12:39:27	D	1.50
5	ALIGARH	KOL	S-NPP	27.83966	78.18176	12:39:27	D	1.30
6	MATHURA	CHHATA	S-NPP	27.88575	77.43291	14:19:44	D	7.10
7	SHAMLI	KAIRANA	S-NPP	29.53937	77.14896	12:39:27	D	2.80

Details of residue burning events in Rajasthan on 02-Oct-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	BUNDI	BUNDI	S-NPP	25.42405	75.75441	14:19:44	D	3.30
2	BUNDI	BUNDI	S-NPP	25.42690	75.75644	14:19:44	D	3.60
3	KOTA	DIGOD	S-NPP	25.36506	76.21191	14:19:44	D	2.30
4	KOTA	PIPALDA	S-NPP	25.45809	76.43482	12:39:27	D	3.00

Details of residue burning events in Madhya Pradesh on 02-Oct-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	DATIA	SEONDHA	S-NPP	25.80337	78.44197	12:39:27	D	3.80

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 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 (ISRO)**

Study Team

ICAR - IARI	Dr V.K. Sehgal	Pr. Scientist & Nodal Officer	iaricreams@gmail.com
	Dr Rajkumar Dhakar	Scientist	rajdhakar.iari@gmail.com
	Mr Mohd Jahangir	Lab Assistant (KRISHI)	mjahangir198@gmail.com
ICAR - ATARI	Dr Parvender Sheoran	Director ATARI (Zone-I) Ludhiana	zcu1ldh@gmail.com
	Dr. J.P. Mishra	Director ATARI (Zone-II) Jodhpur	jp.mishra67@gov.in
	Dr S.K. Dubey	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)
