

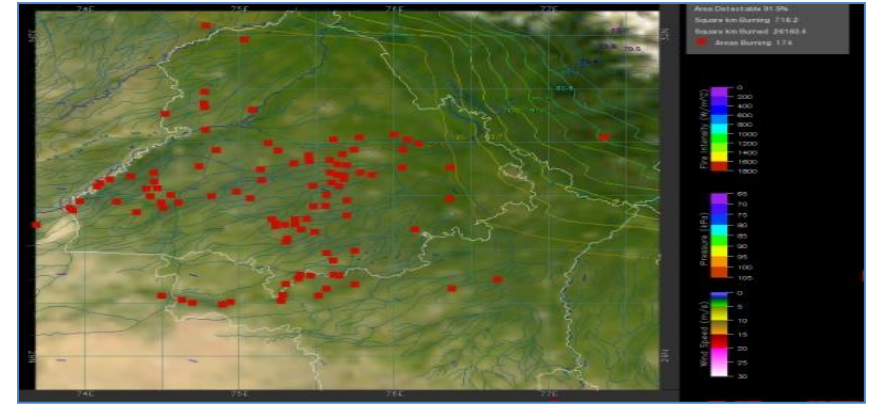
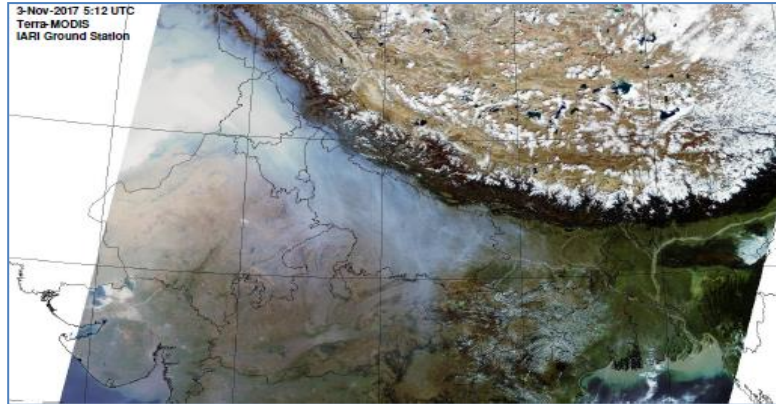


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2024

**Bulletin
No. 09**

**Events Date:
23-Sep-2024**

**Issued on:
23-Sep-2024**



**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS)
Laboratory,**

Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

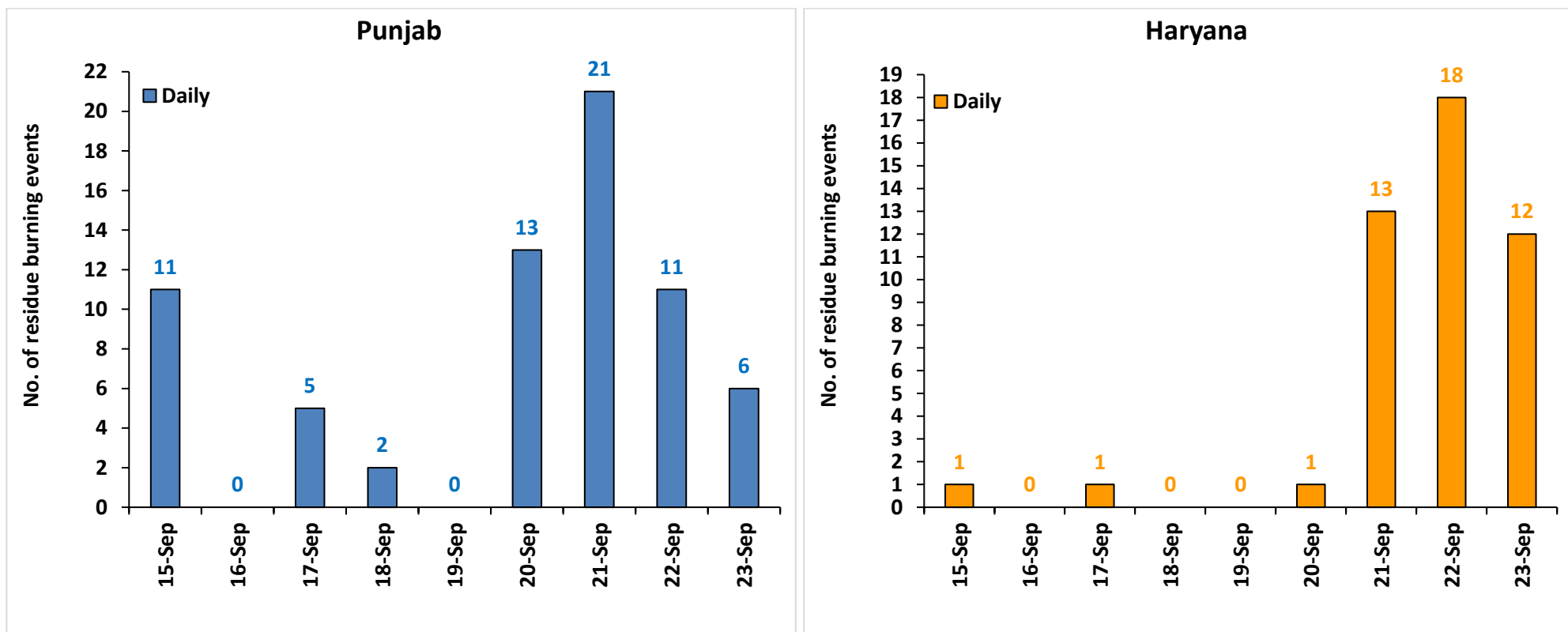
<https://creams.iari.res.in>



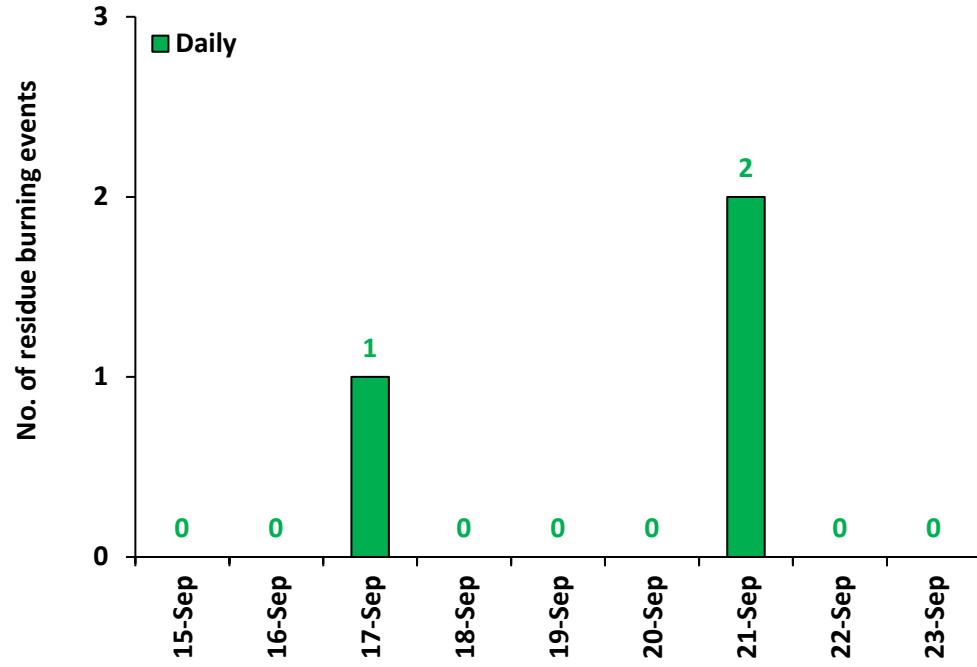
Highlights for 23-Sep-2024

- 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 **19** residue burning events in the six study States on **23-Sep-2024**.
- The state wise events detected on **23-Sep-2024** were **06** in Punjab, **12** in Haryana, **00** in UP, **00** in Delhi, **00** in Rajasthan and **01** in MP.
- Detection of residue burning events was hampered by the presence of scattered clouds over parts of Madhya Pradesh state.

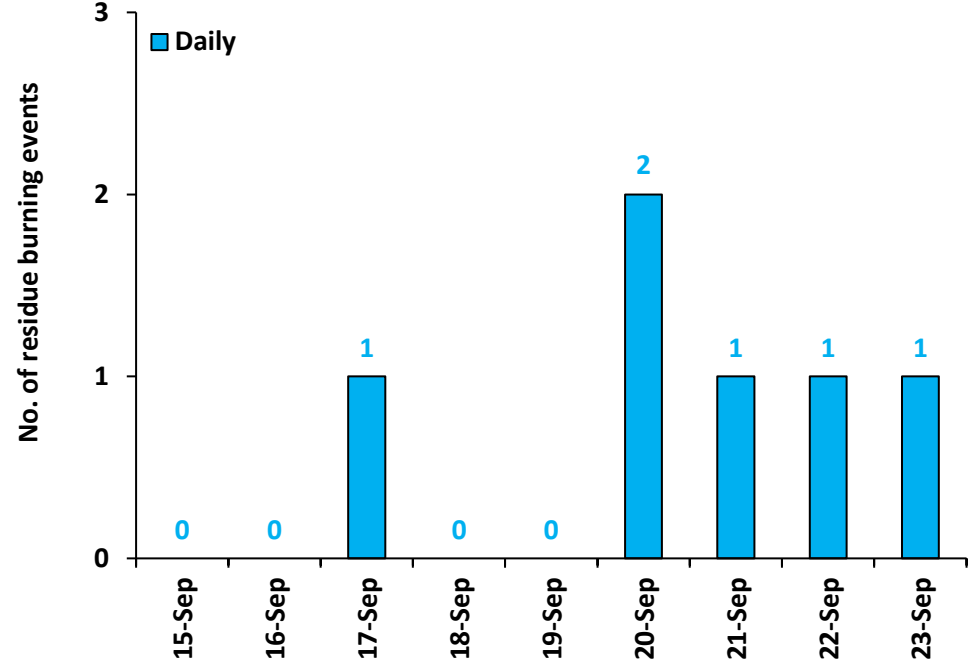
Temporal distribution of rice residue burning events for the study States in 2024



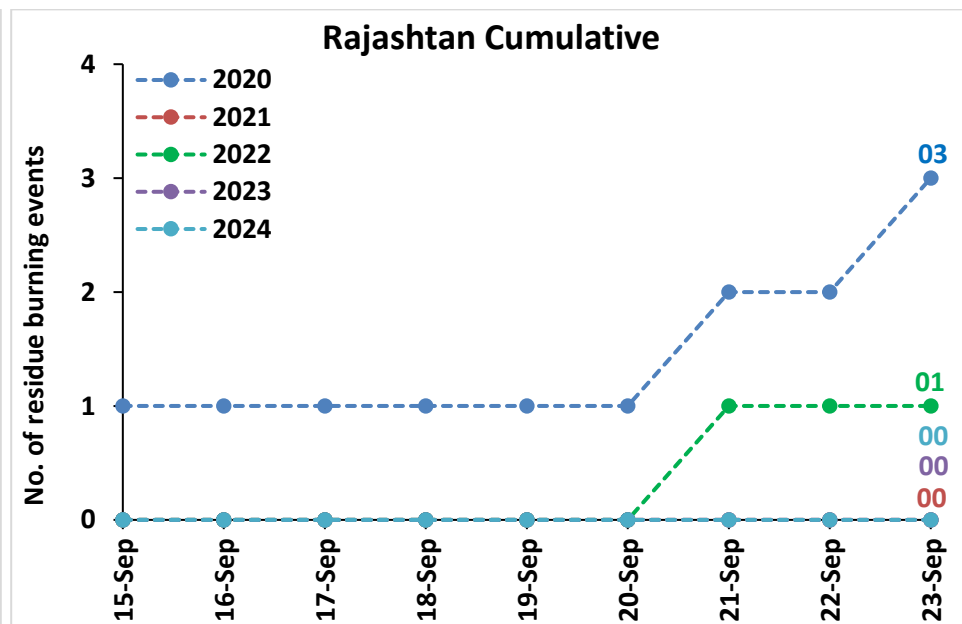
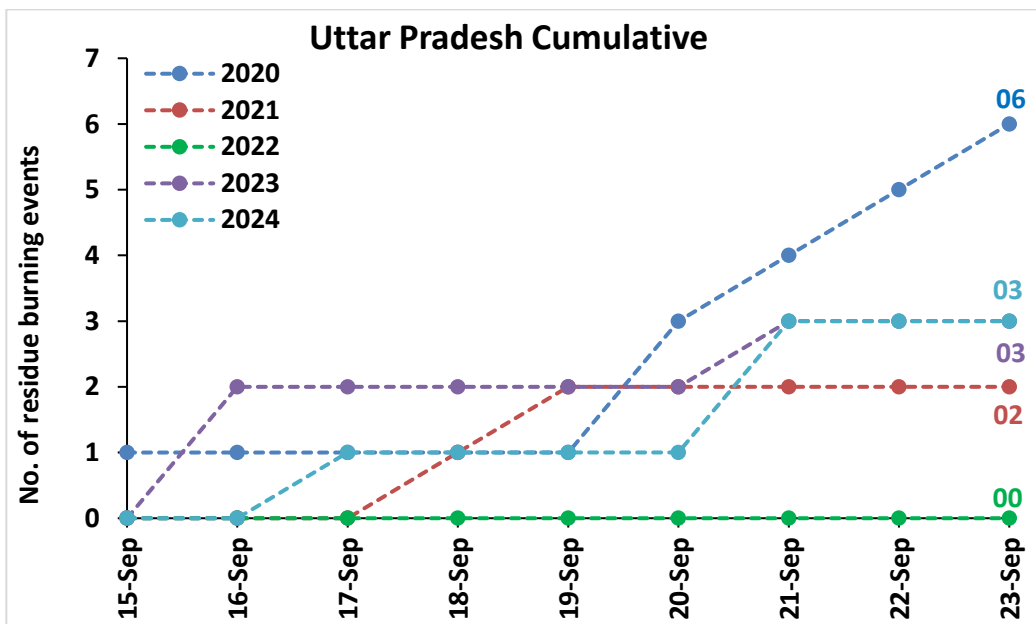
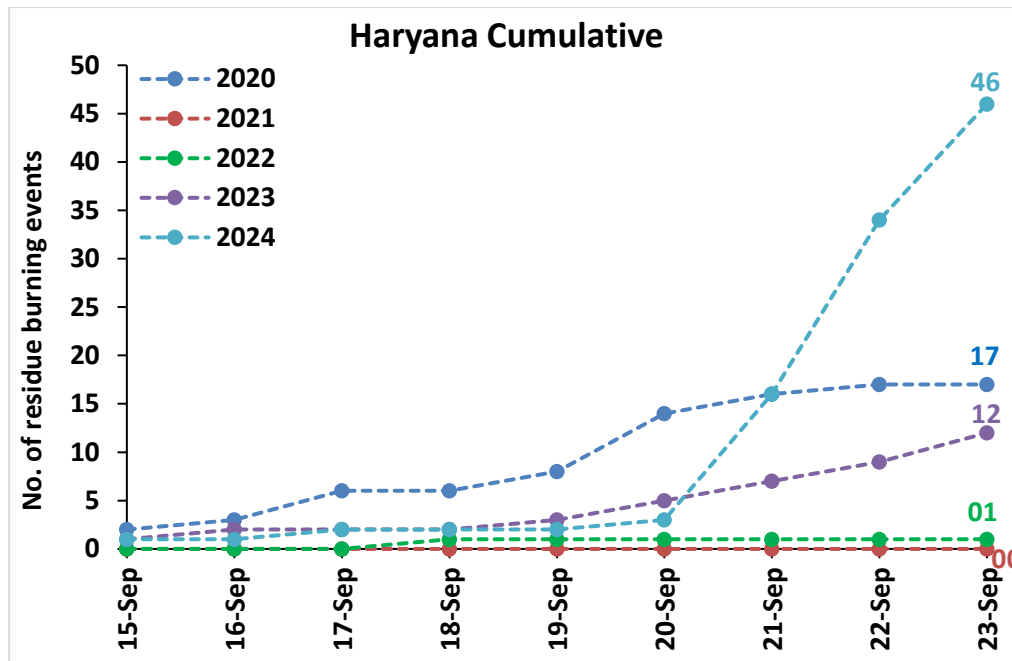
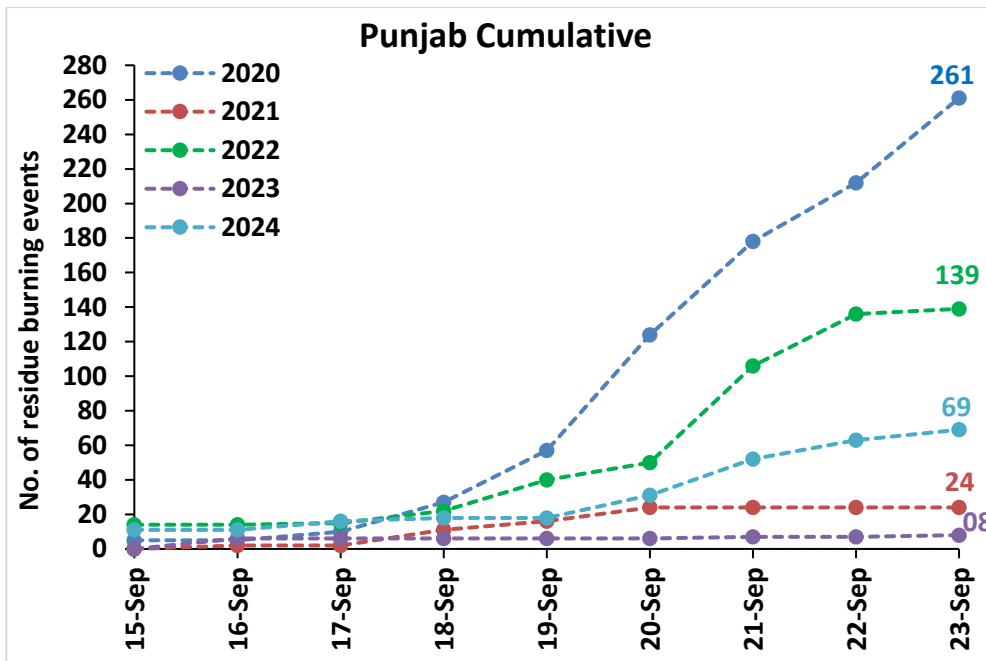
Uttar Pradesh



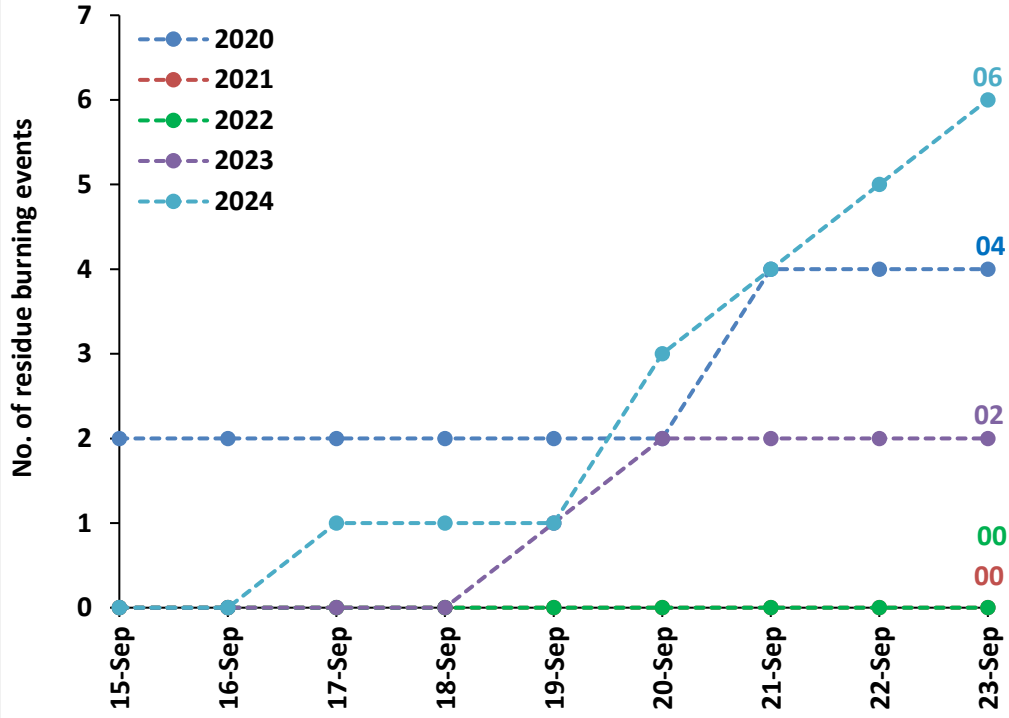
Madhya Pradesh



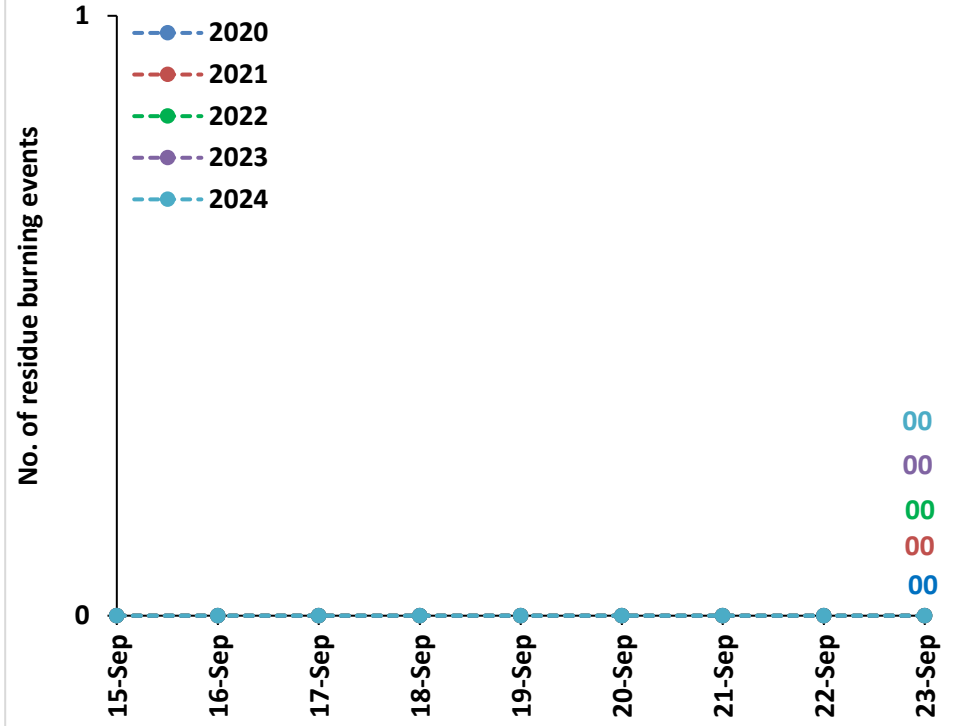
Comparison of residue burning events in current year (2024) with previous years (2020, 2021, 2022 and 2023) for the study States



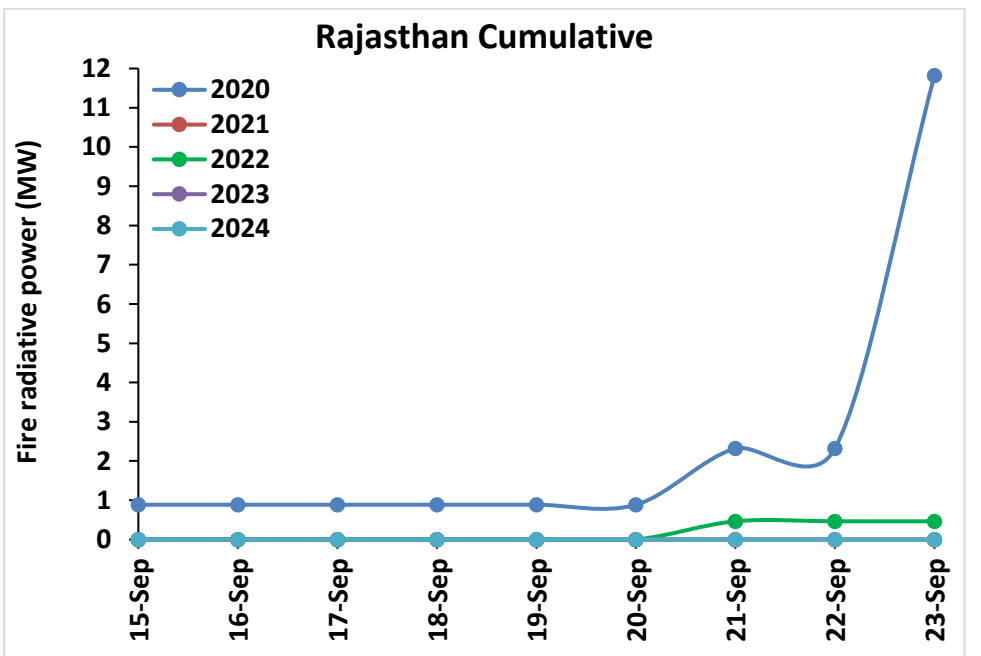
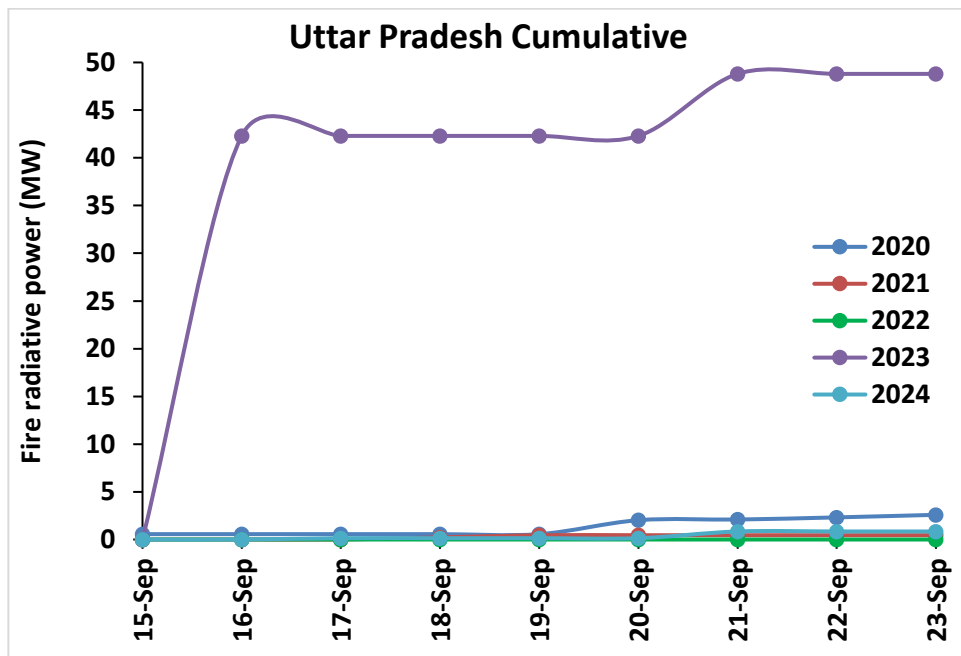
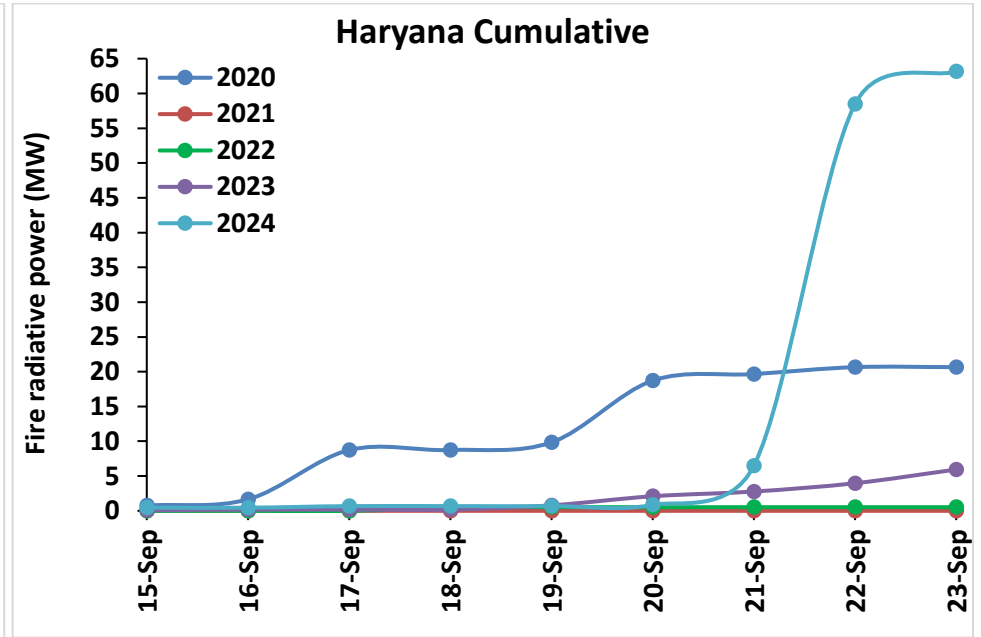
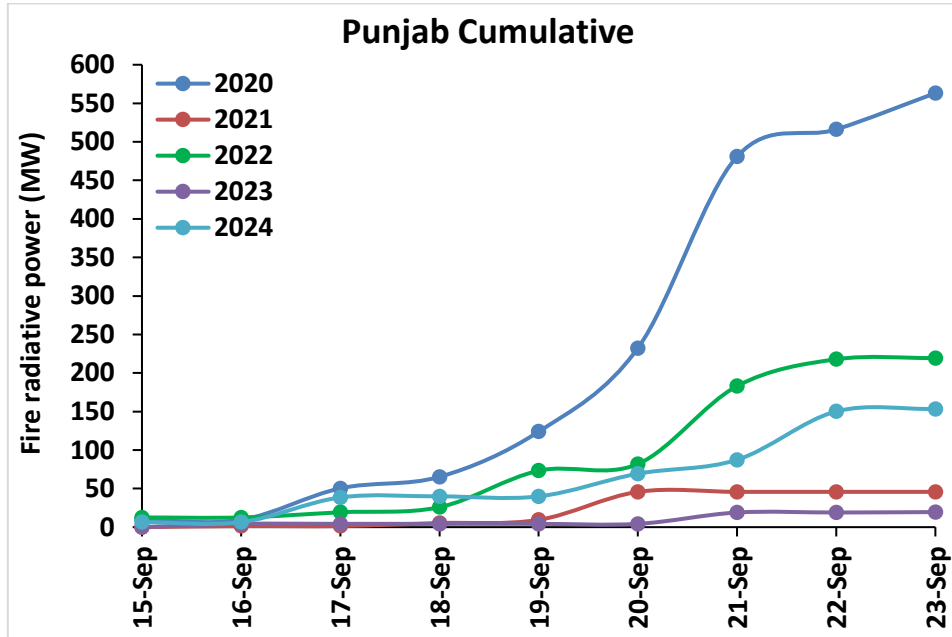
Madhya Pradesh Cumulative



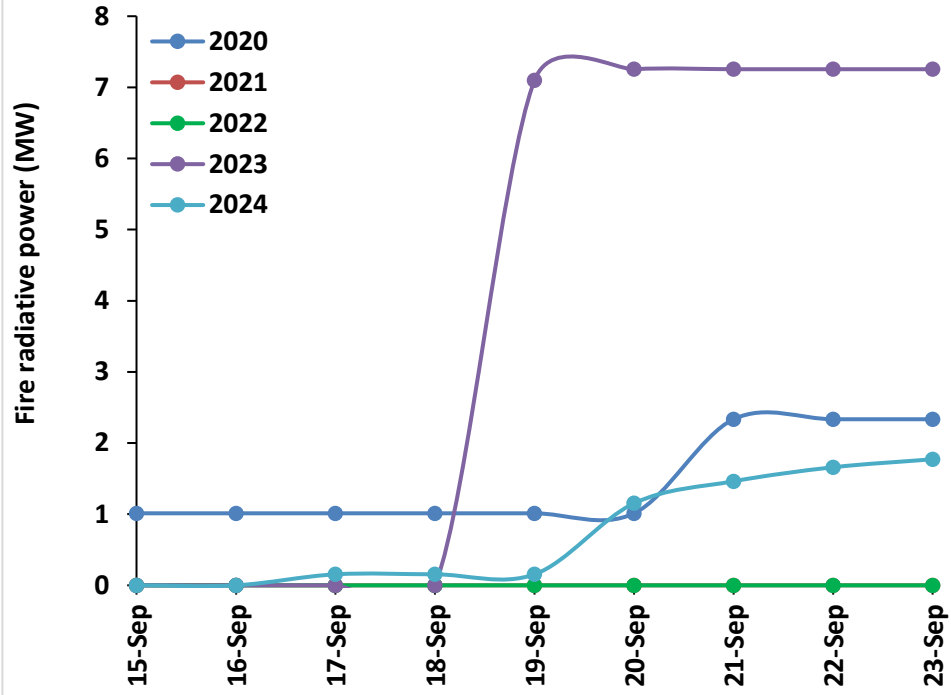
Delhi Cumulative



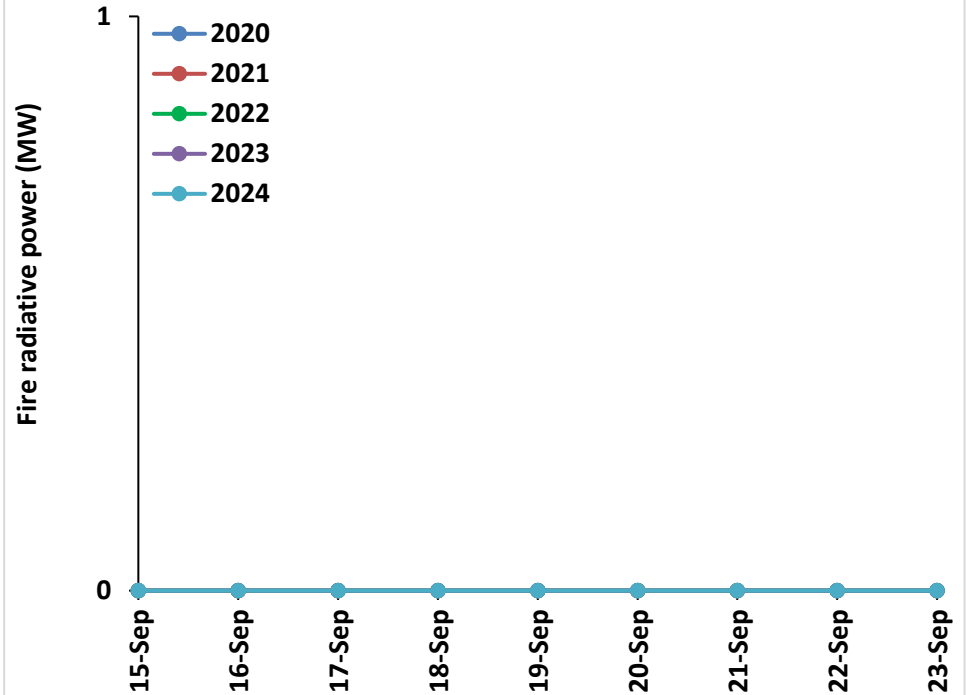
Comparison of residue burning fire power in current year (2024) with previous years (2020,2021,2022 and 2023) for the study States



Madhya Pradesh Cumulative

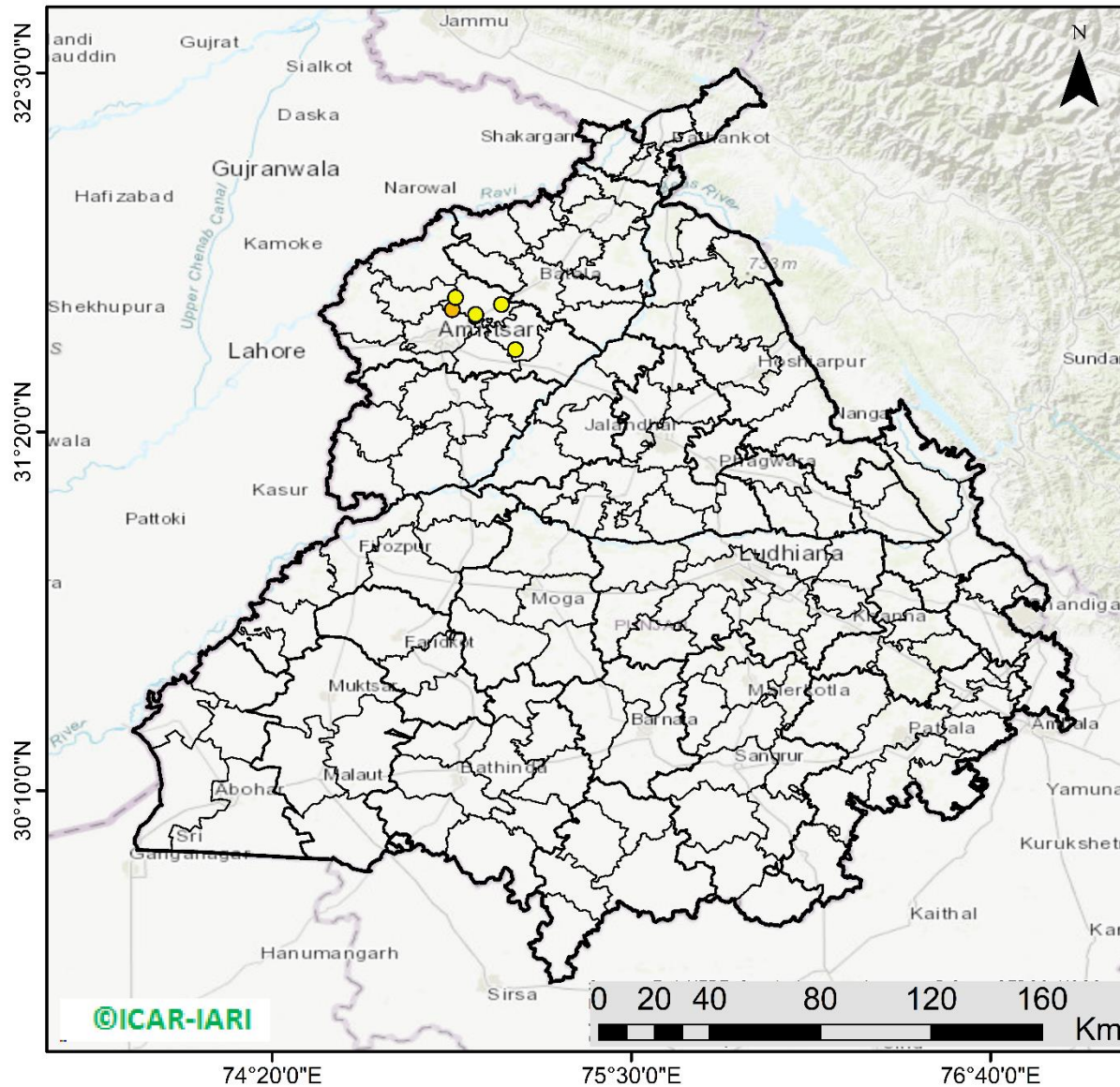


Delhi Cumulative



Punjab

RICE RESIDUE BURNING IN PUNJAB



06 burning events detected in Punjab during (23rd Sep 2024)

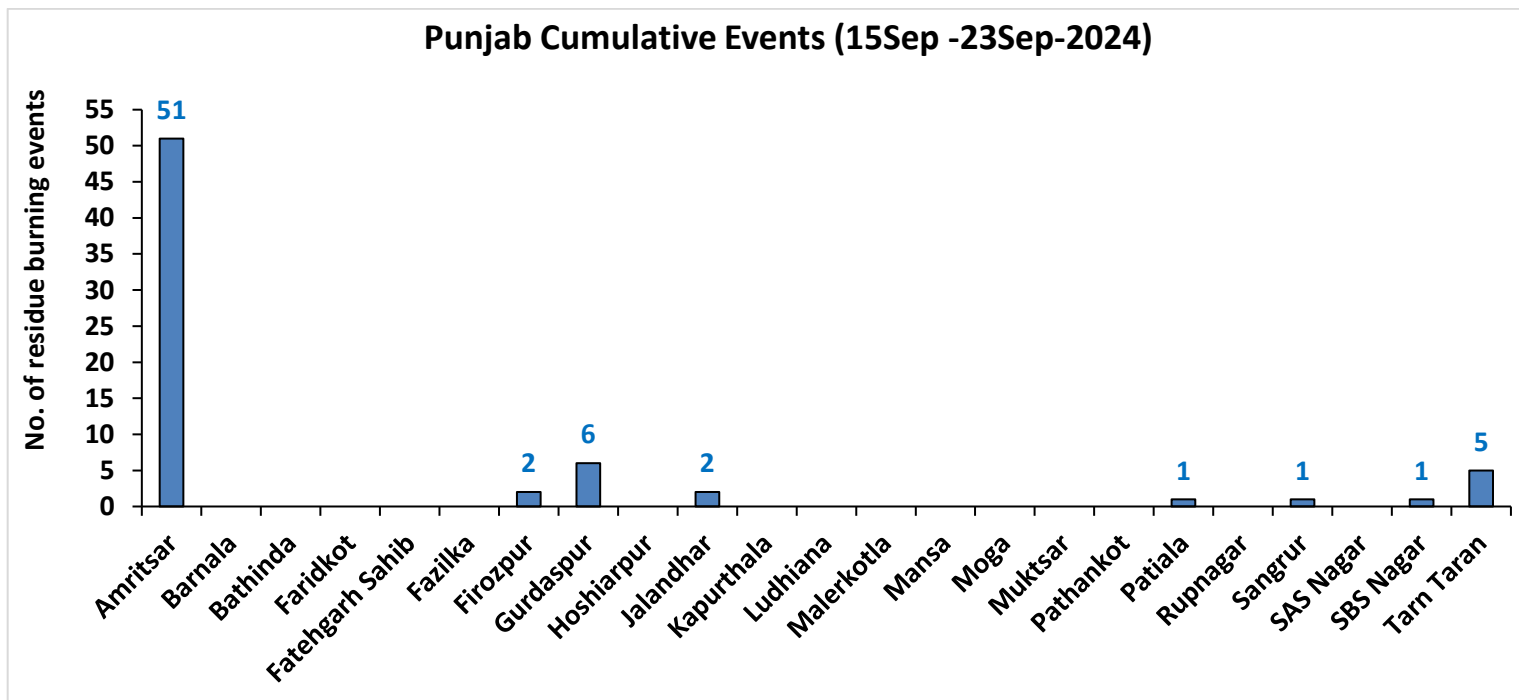
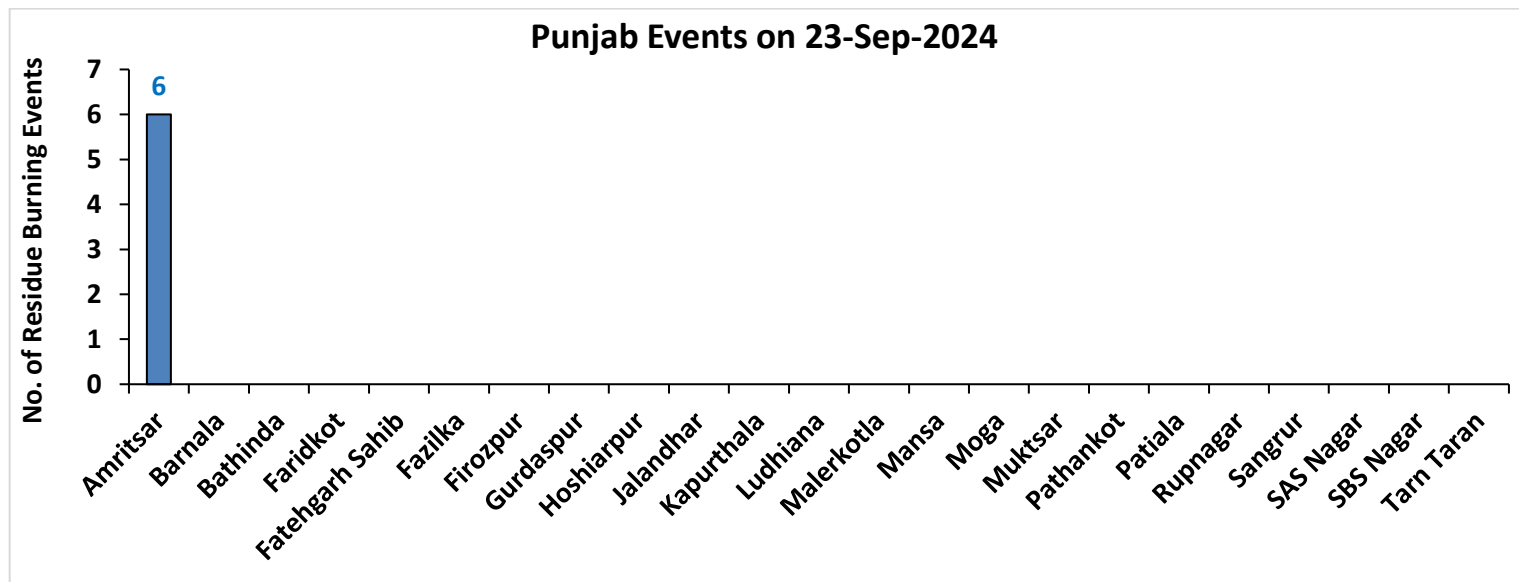
Fire Intensity (W/m²)

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



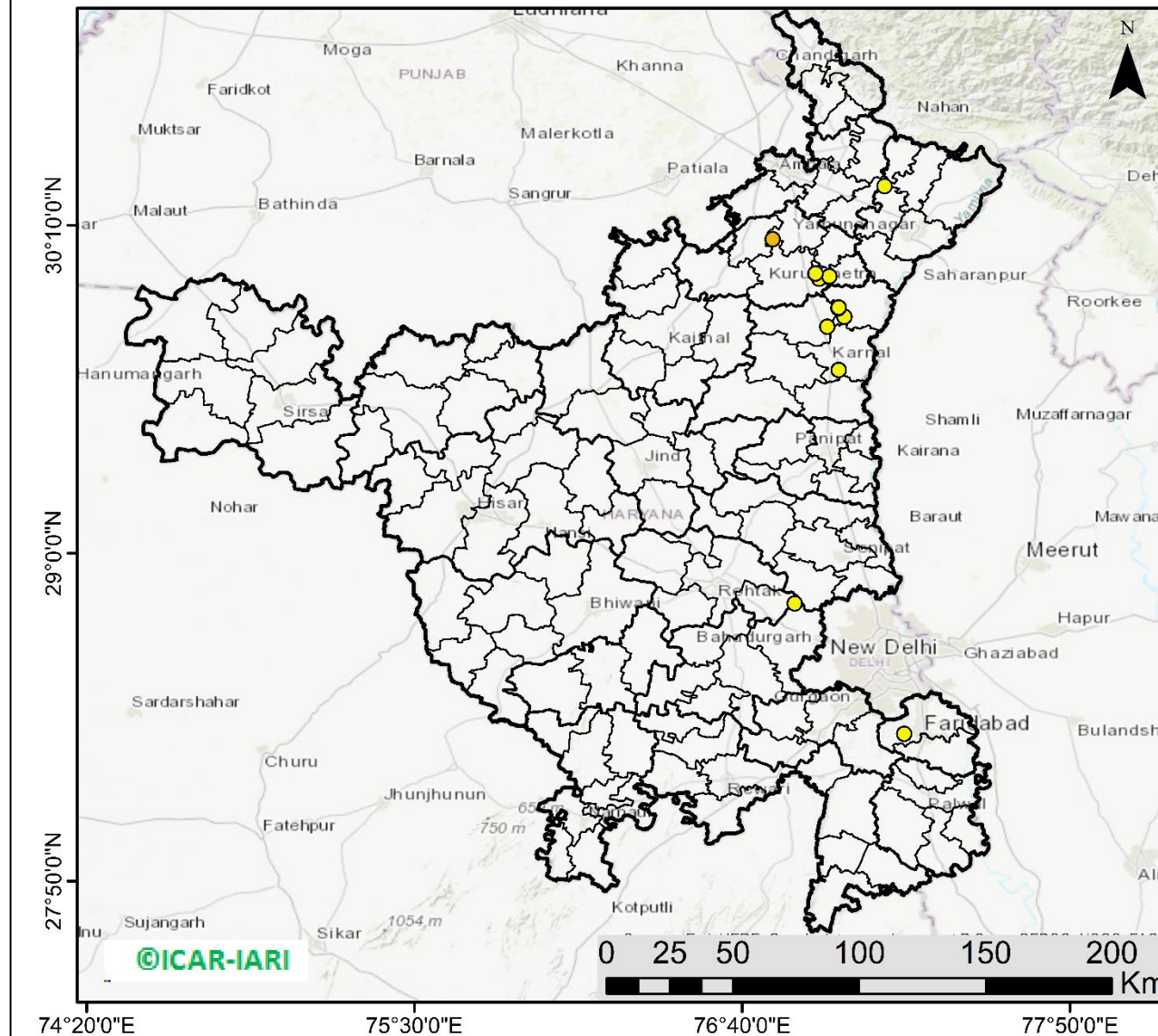
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep-23Sep-2024)



Haryana

RICE RESIDUE BURNING IN HARYANA



12 burning events detected in Haryana on (23rd Sep 2024)

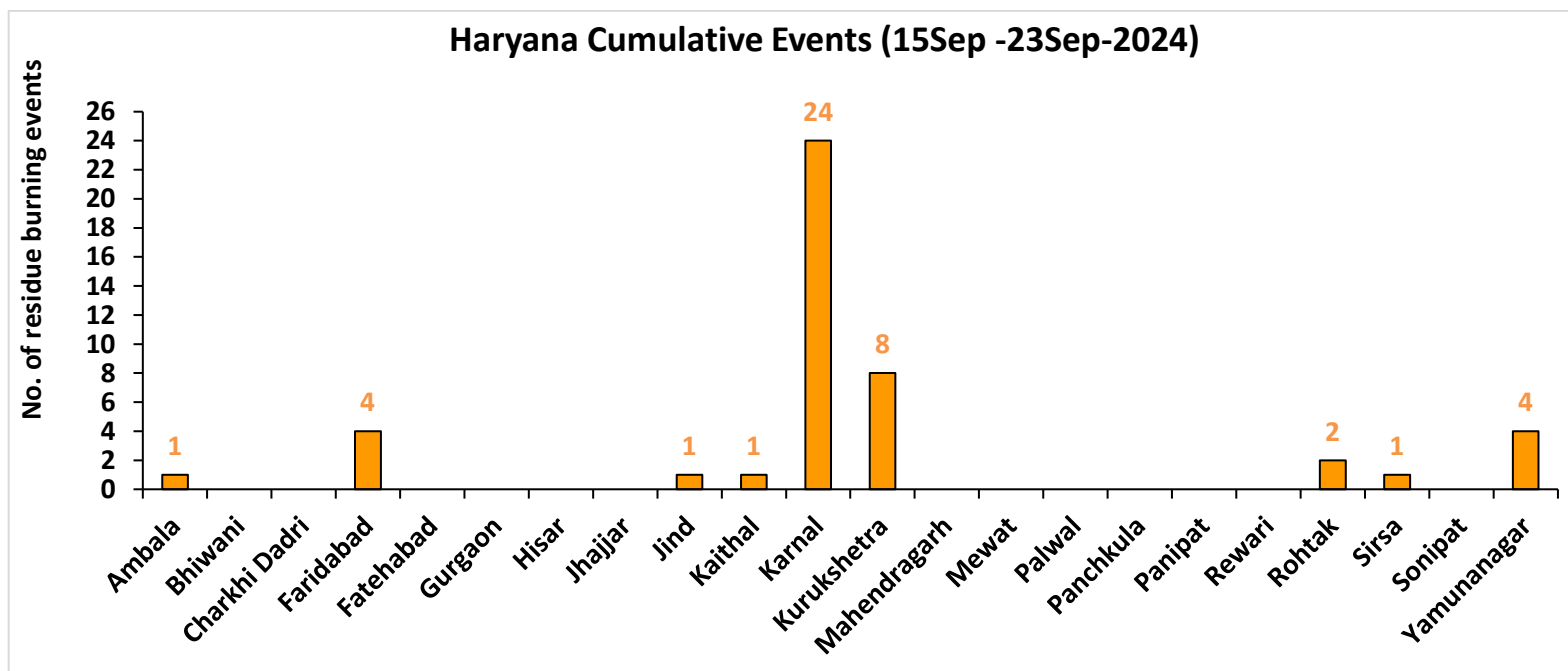
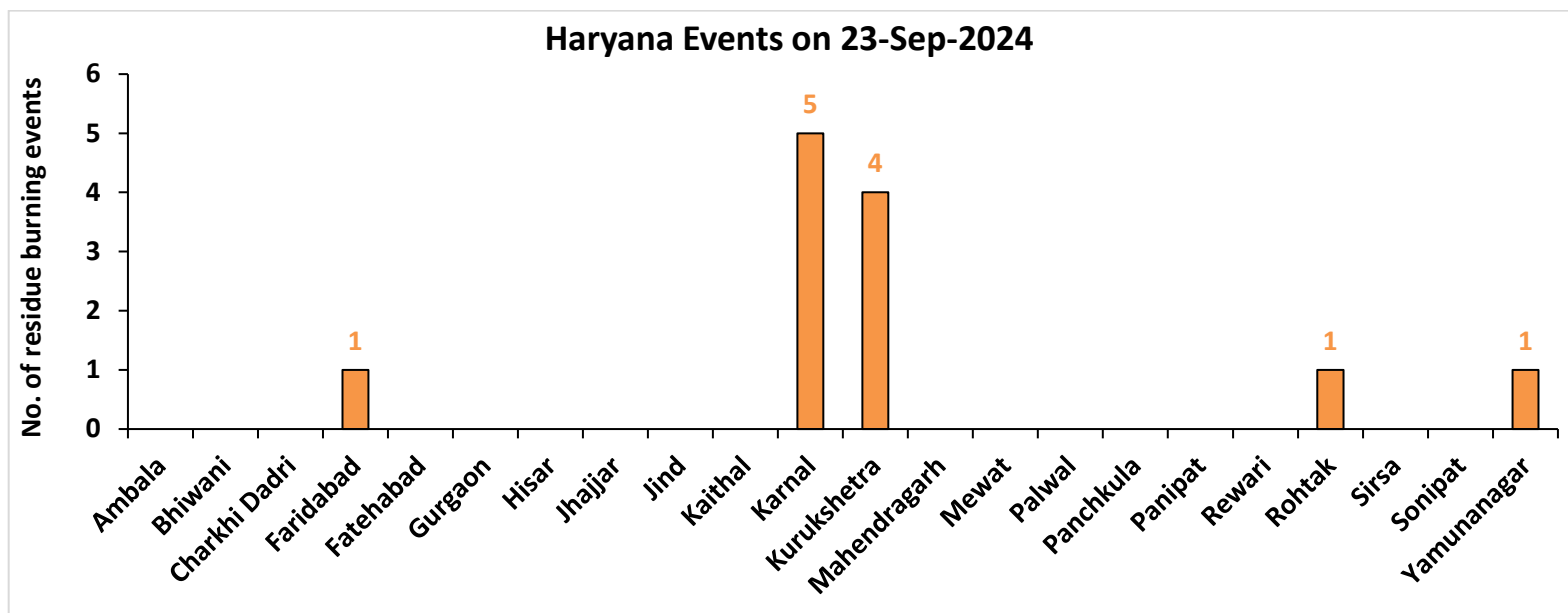
Fire Intensity (W/m²)

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



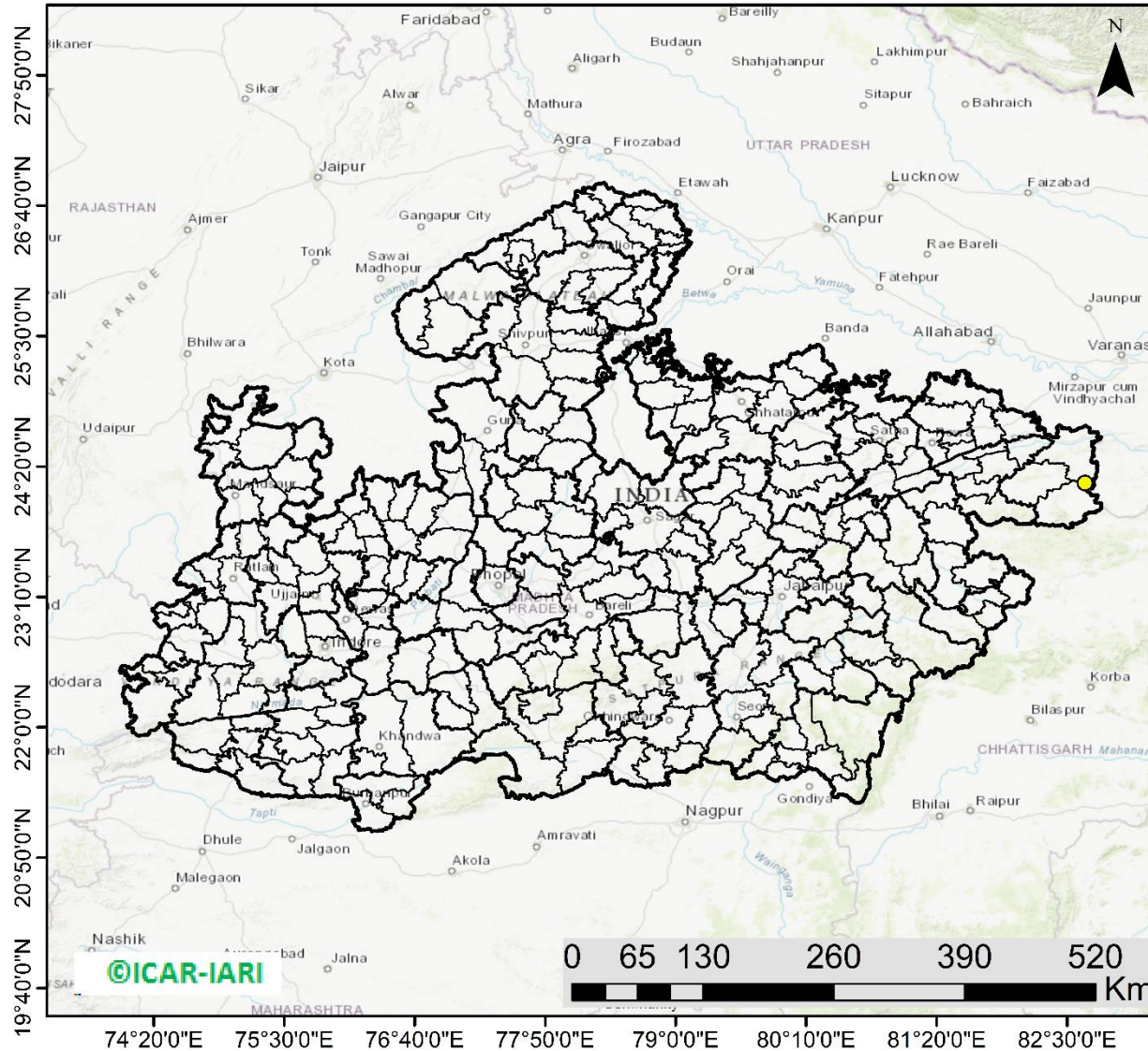
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15Sep-23Sep-2024)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



01 burning events
detected in MP on
(23rd Sep 2024)

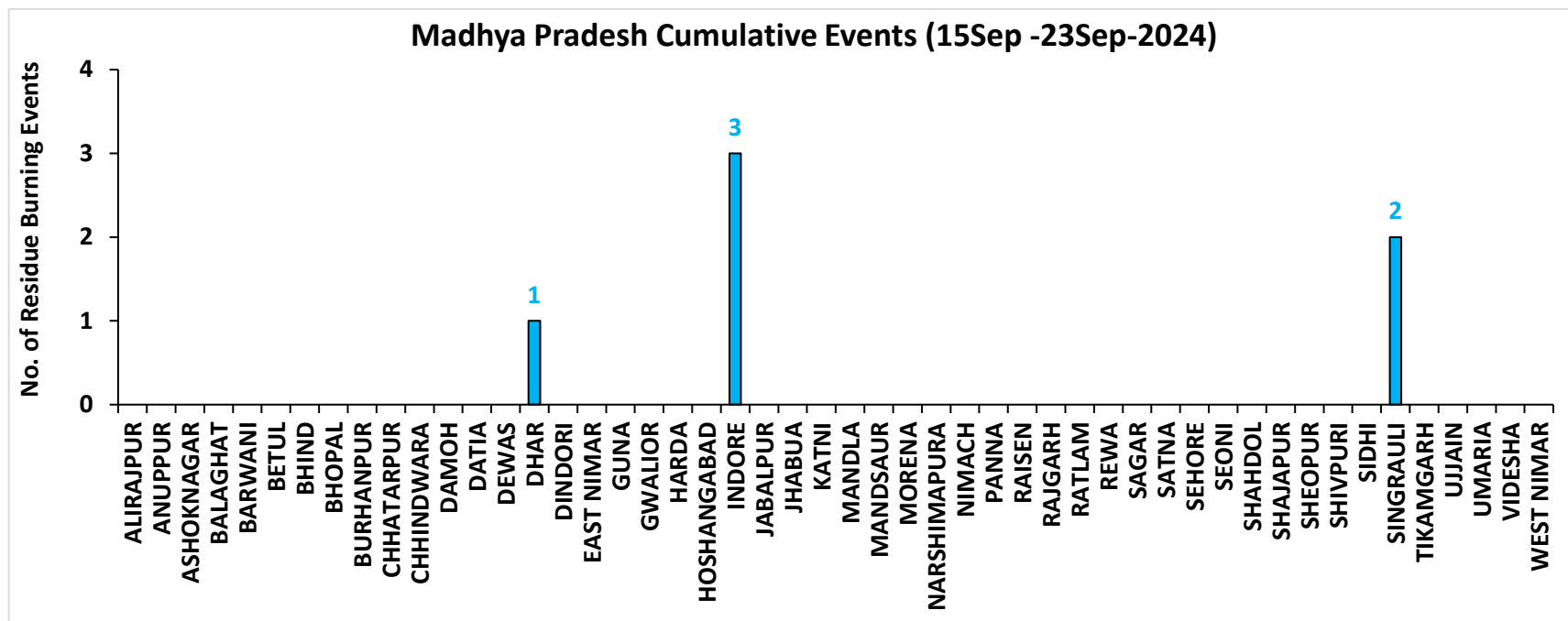
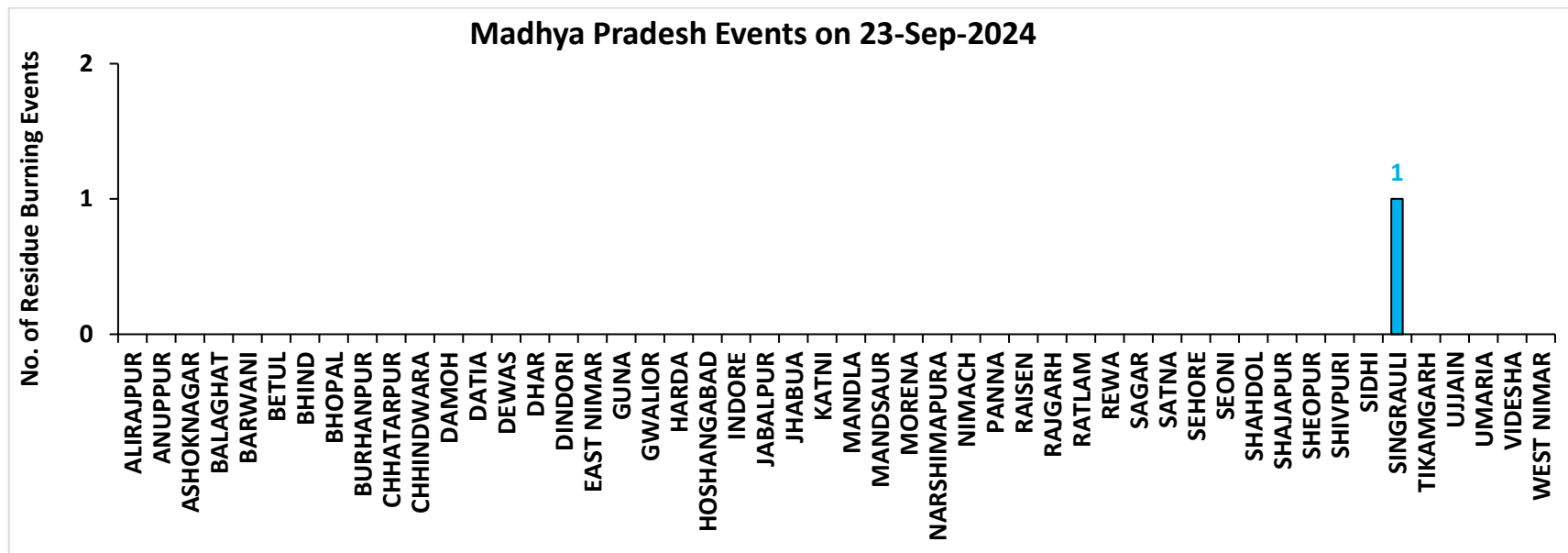
Fire Intensity (W/m²)

- 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-23Sep-2024)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022, 2023 and 2024
(Period: 15 September-23 September)

(a) Punjab

District	15 Sep-23 Sep				
	2020	2021	2022	2023	2024
Amritsar	231	19	121	6	51
Barnala	0	0	0	0	0
Bathinda	0	0	0	0	0
Faridkot	0	1	0	0	0
Fatehgarh Sahib	0	0	0	0	0
Fazilka	0	0	0	0	0
Firozpur	0	0	0	1	2
Gurdaspur	1	0	1	0	6
Hoshiarpur	0	0	0	1	0
Jalandhar	0	0	0	0	2
Kapurthala	2	0	0	0	0
Ludhiana	3	0	0	0	0
Malerkotla	0	0	0	0	0
Mansa	1	0	0	0	0
Moga	2	0	0	0	0
Muktsar	1	0	0	0	0
Pathankot	0	0	0	0	0
Patiala	0	3	1	0	1
Rupnagar	0	0	0	0	0
Sangrur	0	0	0	0	1
SAS NAGAR (Mohali)	3	0	1	0	0
SBS Nagar	0	0	1	0	1
Tarn Taran	17	1	14	0	5
Total	261	24	139	8	69

(b) Haryana

District	15 Sep-23 Sep				
	2020	2021	2022	2023	2024
AMBALA	3	0	0	0	1
BHIWANI	0	0	0	0	0
CHARKHI DADRI	0	0	0	0	0
FARIDABAD	0	0	0	0	4
FATEHABAD	1	0	0	1	0
GURGAON	0	0	0	0	0
HISAR	0	0	0	0	0
JHAJJAR	0	0	0	0	0
JIND	0	0	1	1	1
KAITHAL	0	0	0	0	1
KARNAL	9	0	0	5	24
KURUKSHETRA	2	0	0	1	8
MAHENDRAGARH	0	0	0	0	0
MEWAT	0	0	0	0	0
PALWAL	0	0	0	0	0
PANCHKULA	0	0	0	0	0
PANIPAT	1	0	0	0	0
REWARI	0	0	0	0	0
ROHTAK	0	0	0	1	2
SIRSA	1	0	0	0	1
SONIPAT	0	0	0	2	0
YAMUNANAGAR	0	0	0	1	4
Total	17	0	1	12	46

(c) Uttar Pradesh

District	15 Sep-23 Sep																
	2020	2021	2022	2023	2024	GAUTAMBUDHNAGAR	0	0	0	0	1	MUZAFARNAGAR	0	0	0	0	0
AGRA	0	0	0	0	0	GAZIPUR	0	0	0	0	0	PILHIBHIT	0	0	0	1	0
ALIGARH	0	0	0	0	0	GHAZIABAD	0	0	0	0	1	PRATAPGARH	0	0	0	0	0
ALLAHABAD	0	0	0	0	0	GONDA	0	0	0	0	0	RAIBEARELI	1	0	0	0	0
AMBEDKARNAGAR	0	0	0	0	0	GORAKHPUR	0	0	0	0	0	RAMPUR	0	1	0	0	0
AMETHI	0	0	0	0	0	HAMIRPUR	0	0	0	0	0	SAMBHAL	1	0	0	0	0
AMROHA	0	0	0	0	0	HAPUR	1	0	0	0	0	SANTKABIRNAGAR	0	0	0	0	0
AURAIYA	1	0	0	0	0	HARDOI	0	0	0	0	0	SANTRAVIDASNAGAR	0	0	0	0	0
AZAMGARH	0	0	0	0	0	HATHRAS	0	0	0	0	0	SHAHJAHANPUR	0	0	0	0	1
BADAUN	0	0	0	0	0	JALAUN	0	0	0	0	0	SHAMLI	1	0	0	0	0
BAGHPAT	1	0	0	0	0	JAUNPUR	0	0	0	0	0	SHARANPUR	0	0	0	0	0
BAHRAICH	0	0	0	0	0	JHANSI	0	0	0	0	0	SHRAWASTI	0	0	0	0	0
BALLIA	0	0	0	0	0	KANNAUJ	0	0	0	0	0	SIDDHARTHNAGAR	0	0	0	0	0
BALRAMPUR	0	0	0	0	0	KANPUR	0	1	0	0	0	SITAPUR	0	0	0	0	0
BANDA	0	0	0	0	0	KANPUR DEHAT	0	0	0	0	0	SONBHADRA	0	0	0	0	0
BARABANKI	0	0	0	0	0	KASGANJ	0	0	0	0	0	SULTANPUR	0	0	0	0	0
BAREILLY	0	0	0	0	0	KAUSHAMBI	0	0	0	0	0	UNNAO	0	0	0	0	0
BASTI	0	0	0	0	0	KHERI	0	0	0	0	0	VARANASI	0	0	0	0	0
BIJNOR	0	0	0	0	0	KUSHINAGAR	0	0	0	0	0	Total	6	2	0	3	3
BULANDSAHAR	0	0	0	0	0	LALITPUR	0	0	0	0	0						
CHANDAULI	0	0	0	0	0	LUCKNOW	0	0	0	0	0						
CHITRAKOOT	0	0	0	0	0	MAHARAJGANJ	0	0	0	0	0						
DEORIA	0	0	0	2	0	MAHOBA	0	0	0	0	0						
ETAH	0	0	0	0	0	MAINPURI	0	0	0	0	0						
ETAWAH	0	0	0	0	0	MATHURA	0	0	0	0	0						
FAIZABAD	0	0	0	0	0	MAU	0	0	0	0	0						
FARRUKHABAD	0	0	0	0	0	MEERUT	0	0	0	0	0						
FATEHPUR	0	0	0	0	0	MIRZAPUR	0	0	0	0	0						
FIROZABAD	0	0	0	0	0	MORADABAD	0	0	0	0	0						

(d) Delhi

District	15 Sep-23 Sep				
	2020	2021	2022	2023	2024
CENTRAL	0	0	0	0	0
EAST	0	0	0	0	0
NEW DELHI	0	0	0	0	0
NORTH	0	0	0	0	0
NORTH EAST	0	0	0	0	0
NORTH WEST DELHI	0	0	0	0	0
SHAHADRA	0	0	0	0	0
SOUTH	0	0	0	0	0
SOUTH EAST	0	0	0	0	0
SOUTH WEST DELHI	0	0	0	0	0
WEST DELHI	0	0	0	0	0
Total	0	0	0	0	0

(e) Rajasthan

District	15 Sep-23 Sep				
	2020	2021	2022	2023	2024
AJMER	0	0	0	0	0
ALWAR	0	0	0	0	0
BANSWARA	0	0	0	0	0
BARAN	0	0	0	0	0
BARMER	1	0	0	0	0
BHARATPUR	0	0	0	0	0
BHILWARA	1	0	0	0	0
BIKANER	0	0	0	0	0
BUNDI	0	0	1	0	0
CHITTAURGARH	0	0	0	0	0
CHURU	0	0	0	0	0
DAUSA	0	0	0	0	0
DHOLPUR	0	0	0	0	0
DUNGARPUR	0	0	0	0	0
GANGANAGAR	0	0	0	0	0
HANUMANGARH	0	0	0	0	0
JAIPUR	0	0	0	0	0
JAISELMER	1	0	0	0	0
JALOR	0	0	0	0	0
JHALAWAR	0	0	0	0	0
JHUNJHUNUN	0	0	0	0	0
JODHPUR	0	0	0	0	0
KARALI	0	0	0	0	0
KOTA	0	0	0	0	0
NAGOUR	0	0	0	0	0
PALI	0	0	0	0	0
PRATAPGARH	0	0	0	0	0
RAJSMAND	0	0	0	0	0
SIKAR	0	0	0	0	0
SIROHI	0	0	0	0	0
SWAIMADHOPUR	0	0	0	0	0
TONK	0	0	0	0	0
UDAIPUR	0	0	0	0	0
Total	3	0	1	0	0

(f) Madhya Pradesh

District	15 Sep-23 Sep										
	2020	2021	2022	2023	2024	PANNA	0	0	0	0	0
ALIRAJPUR	0	0	0	0	0	RAISEN	0	0	0	0	0
ANUPPUR	0	0	0	0	0	RAJGARH	0	0	0	0	0
ASHOKNAGAR	0	0	0	0	0	RATLAM	0	0	0	0	0
BALAGHAT	0	0	0	0	0	REWA	0	0	0	0	0
BARWANI	0	0	0	0	0	SAGAR	2	0	0	0	0
BETUL	0	0	0	0	0	SATNA	0	0	0	0	0
BHIND	0	0	0	0	0	SEHORE	0	0	0	0	0
BHOPAL	0	0	0	0	0	SEONI	0	0	0	0	0
BURHANPUR	0	0	0	0	0	SHAHDOL	0	0	0	0	0
CHHATARPUR	0	0	0	0	0	SHAJAPUR	0	0	0	0	0
CHHINDWARA	0	0	0	0	0	SHEOPUR	0	0	0	0	0
DAMOH	0	0	0	1	0	SHIVPURI	0	0	0	0	0
DATIA	0	0	0	0	0	SIDHI	0	0	0	0	0
DEWAS	0	0	0	0	0	SINGRAULI	0	0	0	0	2
DHAR	0	0	0	0	1	TIKAMGARH	0	0	0	0	0
DINDORI	0	0	0	0	0	UJJAIN	0	0	0	0	0
EAST NIMAR	0	0	0	0	0	UMARIA	0	0	0	0	0
GUNA	0	0	0	0	0	VIDESHA	0	0	0	0	0
GWALIOR	0	0	0	0	0	WEST NIMAR	0	0	0	0	0
HARDA	2	0	0	0	0	Total	4	0	0	2	6
HOSHANGABAD	0	0	0	1	0						
INDORE	0	0	0	0	3						
JABALPUR	0	0	0	0	0						
JHABUA	0	0	0	0	0						
KATNI	0	0	0	0	0						
MANDLA	0	0	0	0	0						
MANDSAUR	0	0	0	0	0						
MORENA	0	0	0	0	0						
NARSHIMAPURA	0	0	0	0	0						
NIMACH	0	0	0	0	0						

State-wise and date-wise number of paddy residue burning events detected in 2020 ,2021 ,2022, 2023 and 2024
(Period: 15 September-23 September)

Number of Paddy Residue Burning Events Detected

Date	Punjab					Haryana					Uttar Pradesh				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
15-Sep	5	0	14	0	11	2	0	0	1	1	1	0	0	0	0
16-Sep	0	2	0	6	0	1	0	0	1	0	0	0	0	2	0
17-Sep	5	0	1	0	5	3	0	0	0	1	0	0	0	0	1
18-Sep	17	9	7	0	2	0	0	1	0	0	0	1	0	0	0
19-Sep	30	5	18	0	0	2	0	0	1	0	0	1	0	0	0
20-Sep	67	8	10	0	13	6	0	0	2	1	2	0	0	0	0
21-Sep	54	0	56	1	21	2	0	0	2	13	1	0	0	1	2
22-Sep	34	0	30	0	11	1	0	0	2	18	1	0	0	0	0
23-Sep	49	0	3	1	6	0	0	0	3	12	1	0	0	0	0
Total	261	24	139	8	69	17	0	1	12	46	6	2	0	3	3

Number of Paddy Residue Burning Events Detected

Date	Delhi					Rajasthan					Madhya Pradesh				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
15-Sep	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0
16-Sep	0	0	0	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	0	0	1
18-Sep	0	0	0	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	0	0	1	0
20-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
21-Sep	0	0	0	0	0	1	0	1	0	0	2	0	0	0	1
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	3	0	1	0	0	4	0	0	2	6

Details of residue burning events in Punjab on 23-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	MAJITHA	S-NPP	31.71303	74.99498	12:44:32	D	2.10
2	AMRITSAR	MAJITHA	S-NPP	31.71453	74.99446	12:44:32	D	3.00
3	AMRITSAR	MAJITHA	S-NPP	31.73013	74.91832	14:24:50	D	8.20
4	AMRITSAR	MAJITHA	S-NPP	31.74700	75.07838	12:44:32	D	2.20
5	AMRITSAR	MAJITHA	S-NPP	31.76996	74.92903	14:24:50	D	4.40
6	AMRITSAR	TARSIKKA	S-NPP	31.60026	75.12370	12:44:32	D	3.00

Details of residue burning events in Haryana on 23-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	FARIDABAD	FARIDABAD	S-NPP	28.35683	77.24353	01:34:33	N	0.70
2	KARNAL	INDRI	S-NPP	29.84112	77.03075	12:44:32	D	2.50
3	KARNAL	INDRI	S-NPP	29.87143	77.00949	12:44:32	D	2.70
4	KARNAL	INDRI	S-NPP	29.87358	77.01031	12:44:32	D	2.80
5	KARNAL	KARNAL	S-NPP	29.65150	77.01045	12:44:32	D	1.70
6	KARNAL	NILOKHERI	S-NPP	29.80576	76.96997	12:44:32	D	2.10
7	KURUKSHETRA	LADWA	S-NPP	29.98497	76.97740	12:44:32	D	3.70
8	KURUKSHETRA	THANESAR	S-NPP	29.97635	76.94073	12:44:32	D	4.10
9	KURUKSHETRA	THANESAR	S-NPP	29.99466	76.92802	12:44:32	D	3.70
10	KURUKSHETRA	THANESAR	S-NPP	30.11683	76.77555	12:44:32	D	5.60
11	ROHTAK	SAMPLA	S-NPP	28.82067	76.85366	01:34:33	N	0.70
12	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.30531	77.17340	14:24:50	D	3.10

Details of residue burning events in Madhya Pradesh on 23-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	SINGRAULI	SINGRAULI	S-NPP	24.18398	82.66126	01:34:33	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 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

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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)

The DASHBOARD for paddy residue burning events is available at weblink: [CREAMS Fire Dashboard](#)
