

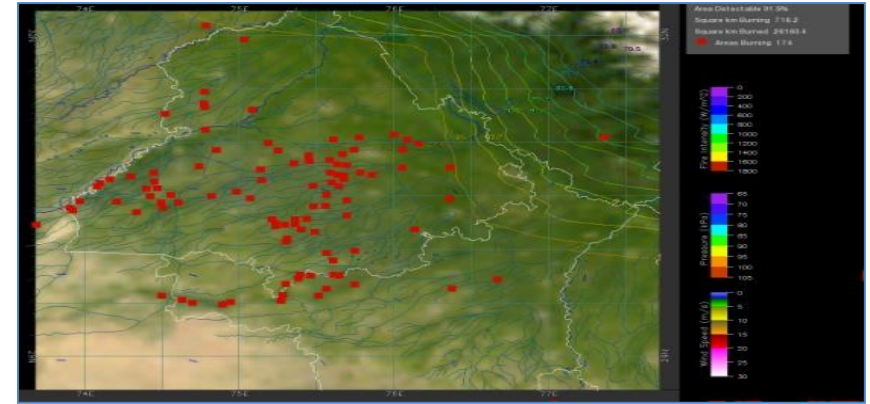
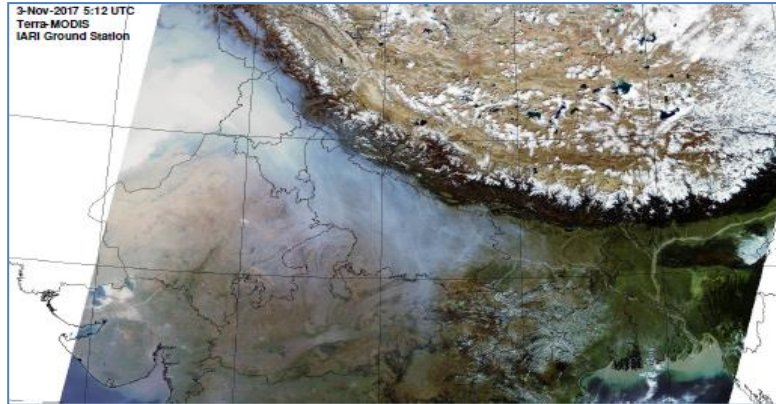


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2024

Bulletin
No. 08

Events Date:
22-Sep-2024

Issued on:
22-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

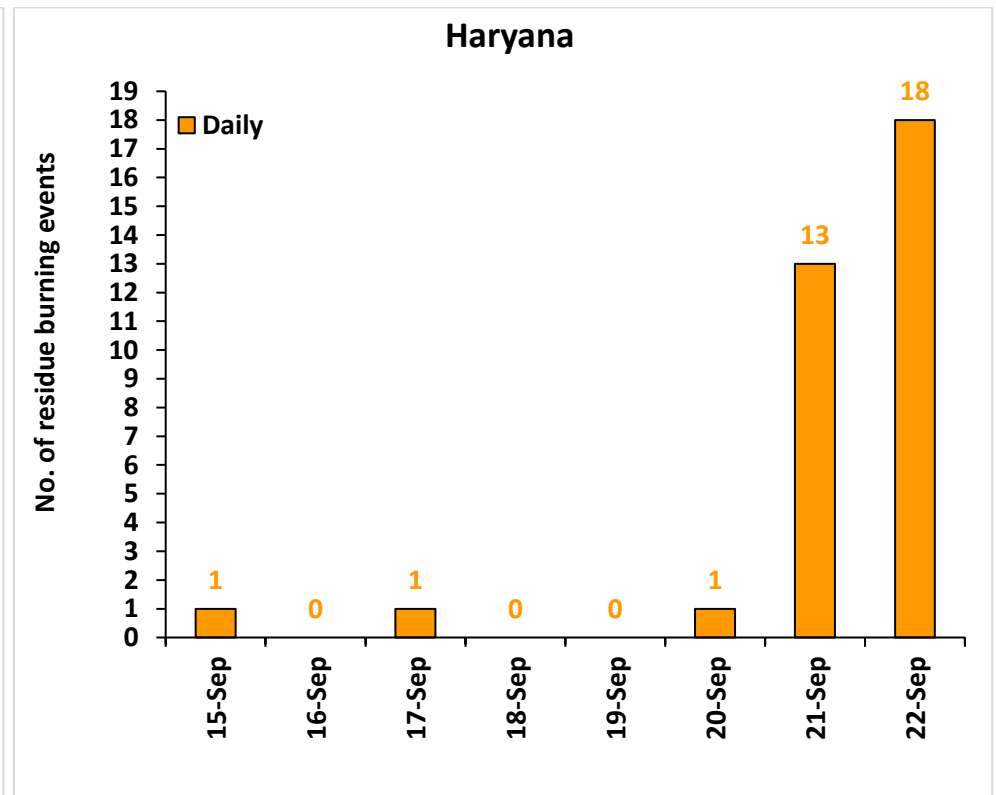
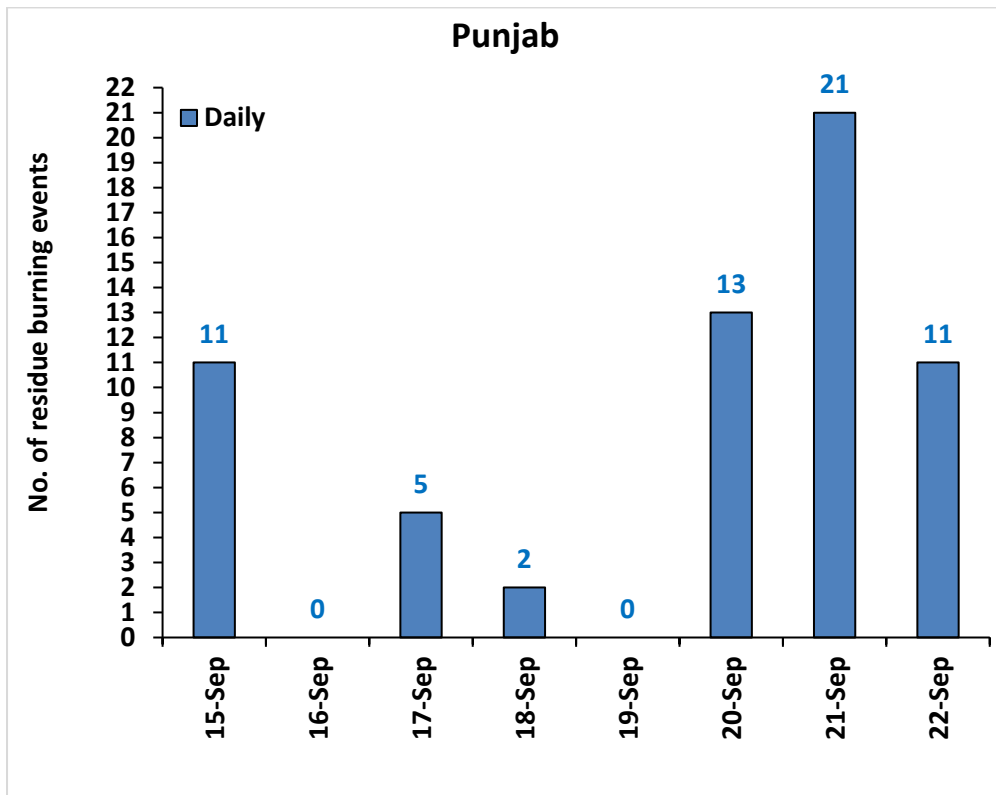
<https://creams.iari.res.in>



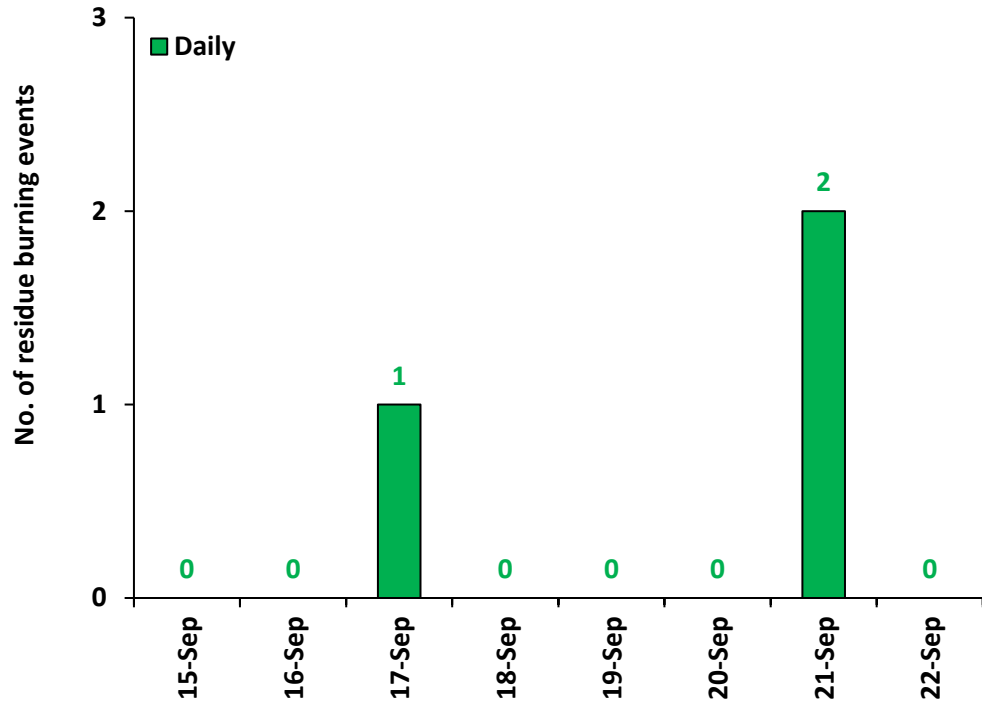
Highlights for 22-Sep-2024

- 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 **30** residue burning events in the six study States on **22-Sep-2024**.
- The state wise events detected on **22-Sep-2024** were **11** in Punjab, **18** 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.

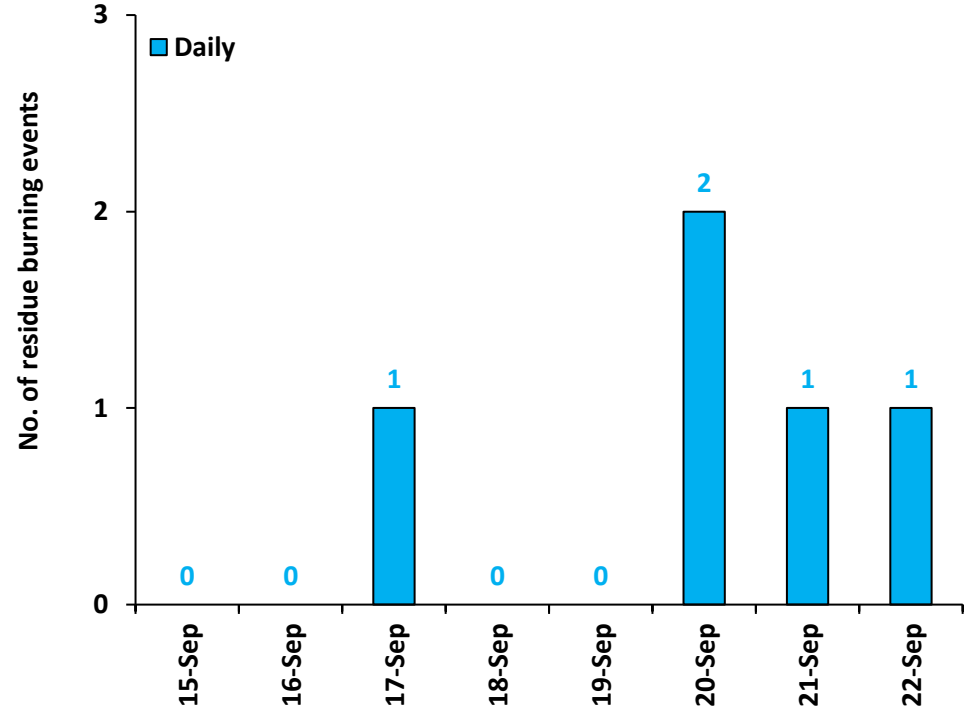
Temporal distribution of rice residue burning events for the study States in 2024



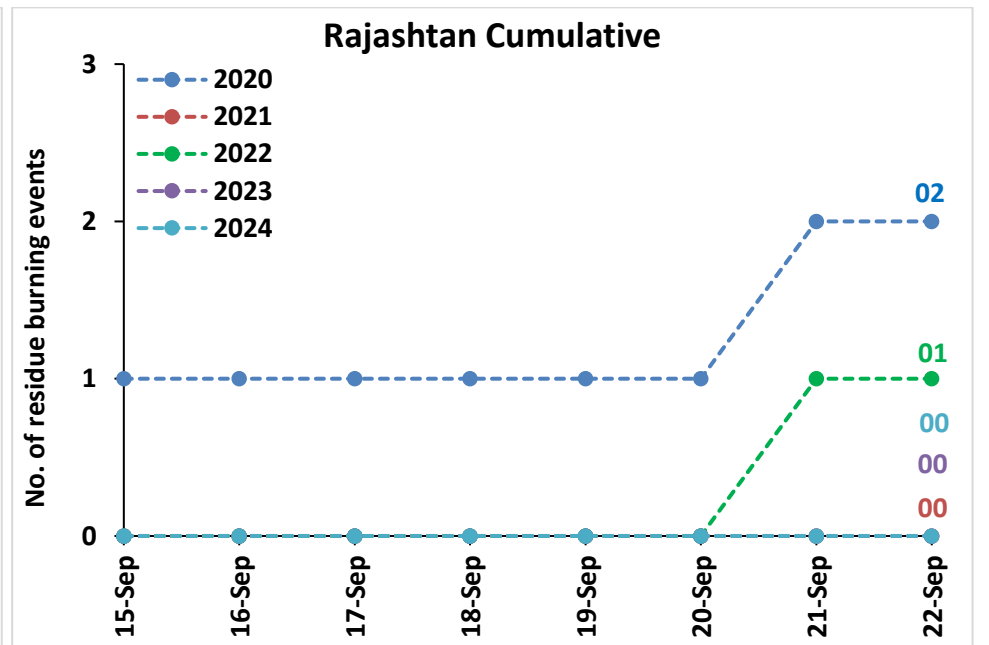
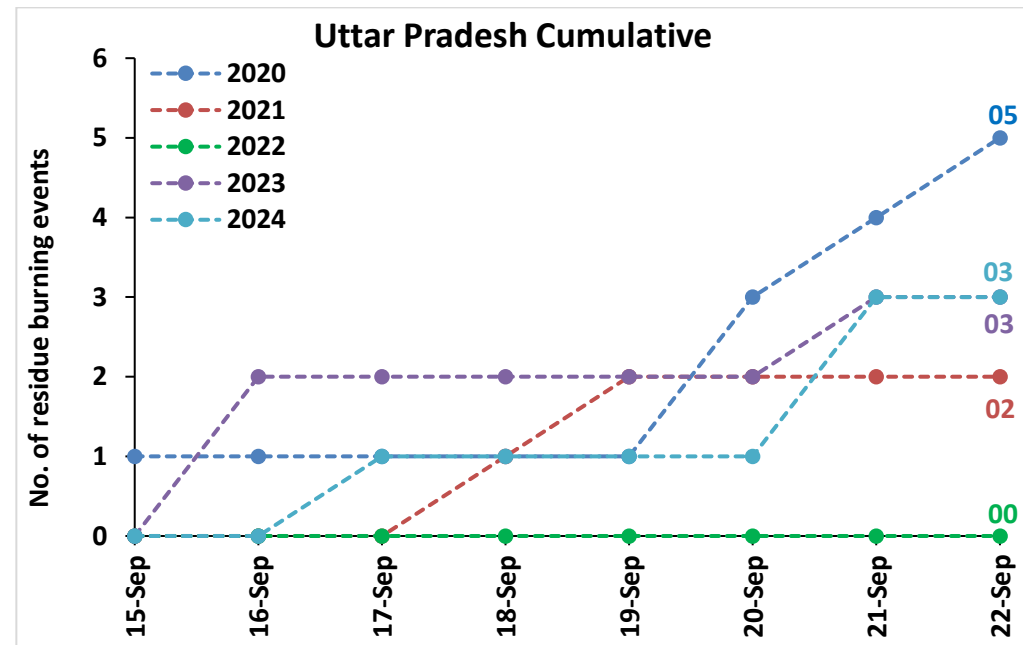
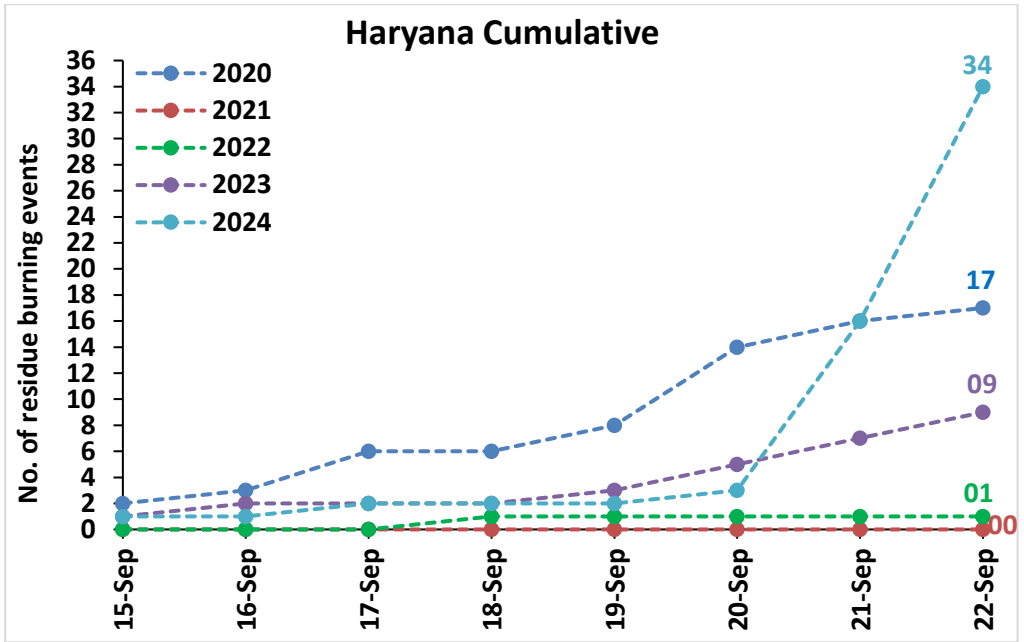
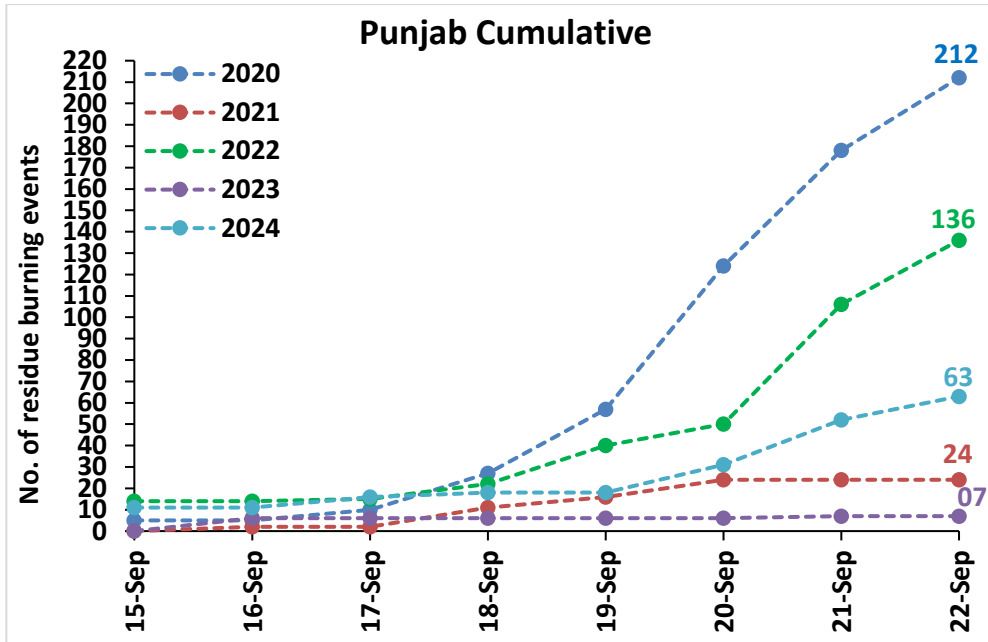
Uttar Pradesh



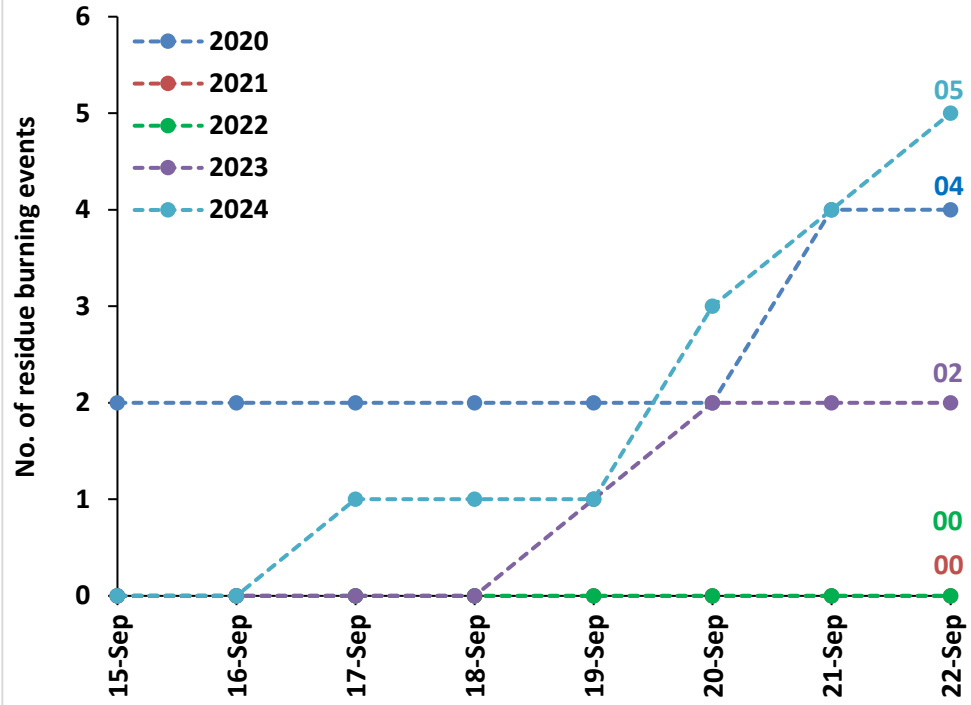
Madhya Pradesh



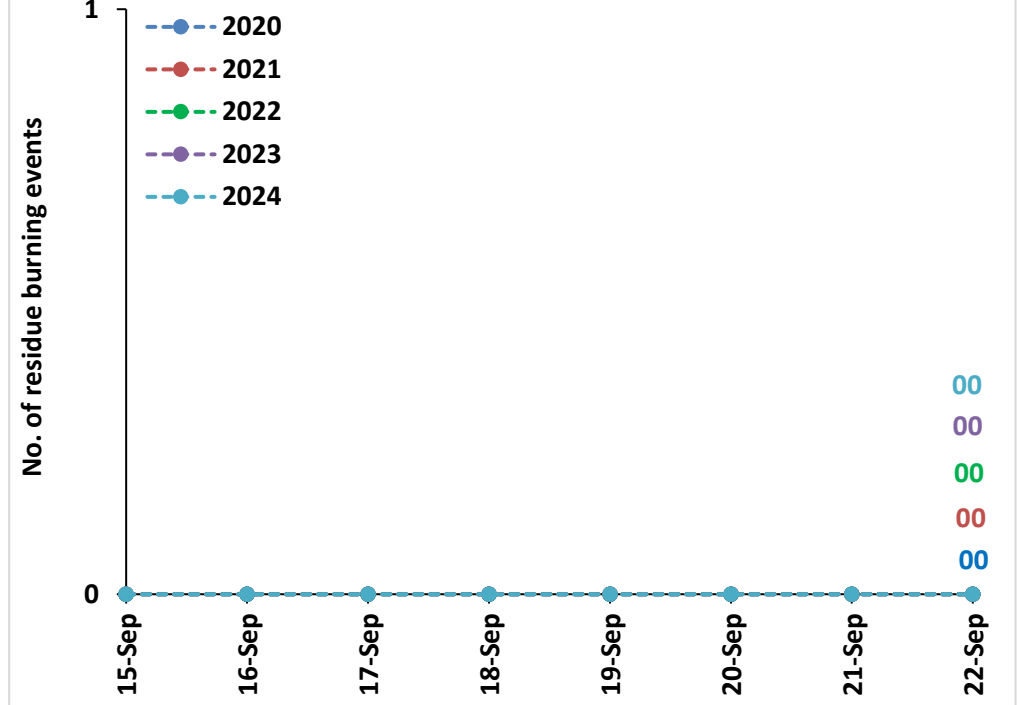
Comparison of residue burning events in current year (2024) with previous years (2020, 2021, 2022 and 2023) for the study States



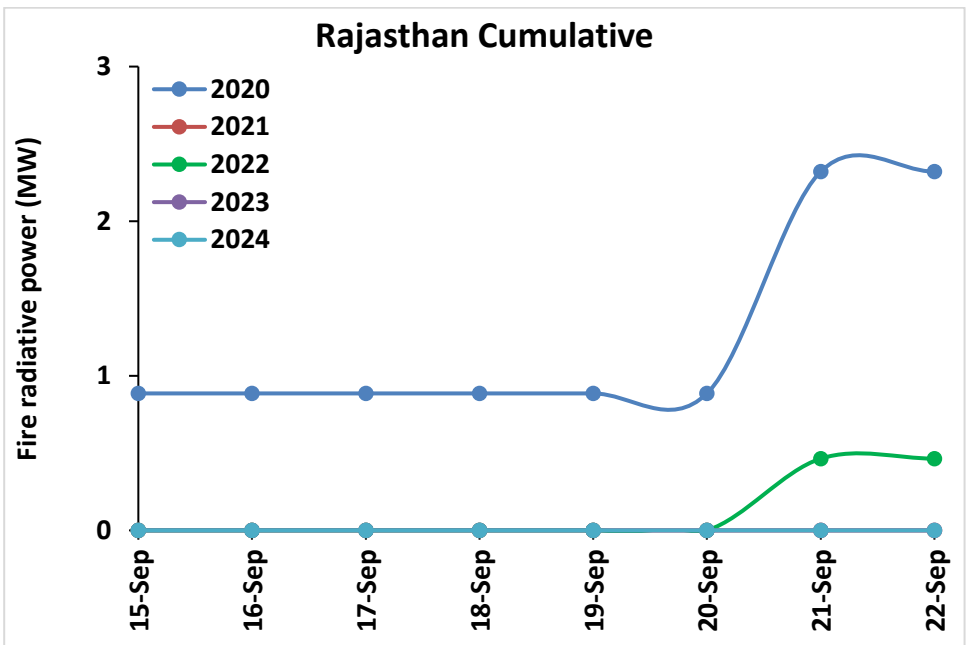
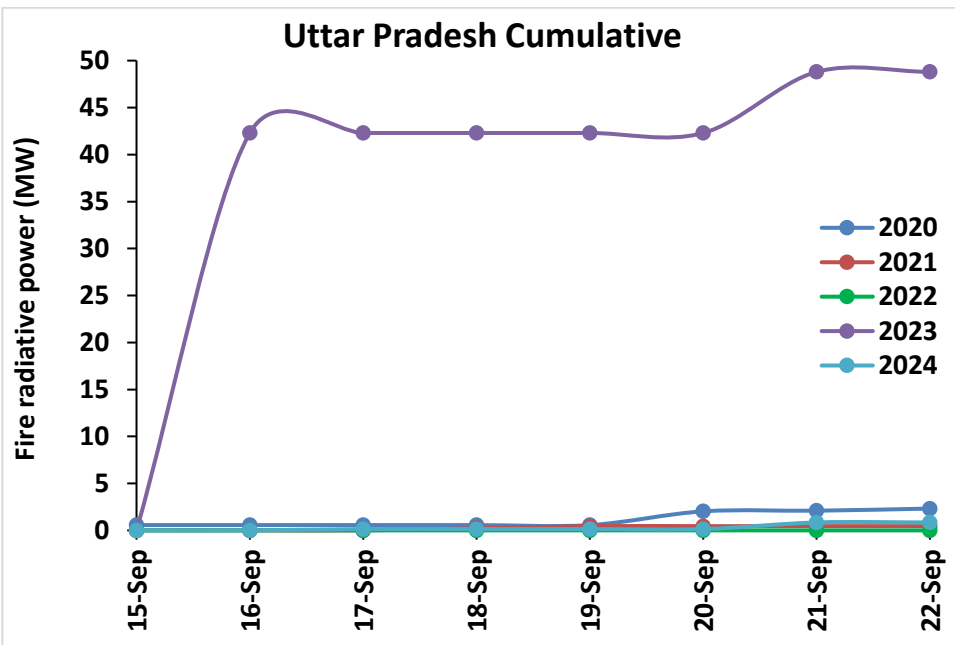
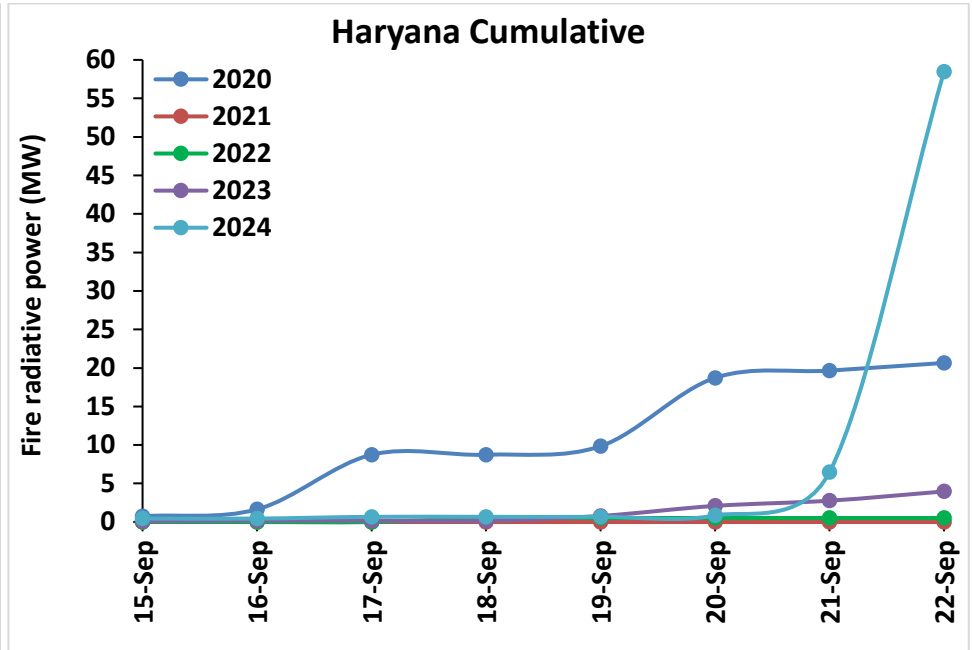
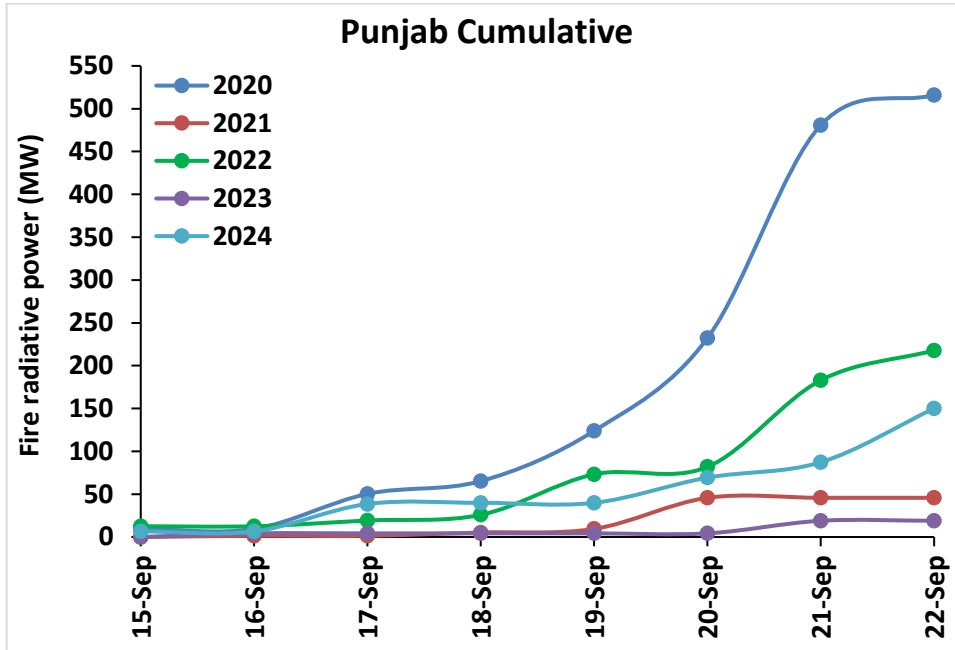
Madhya Pradesh Cumulative



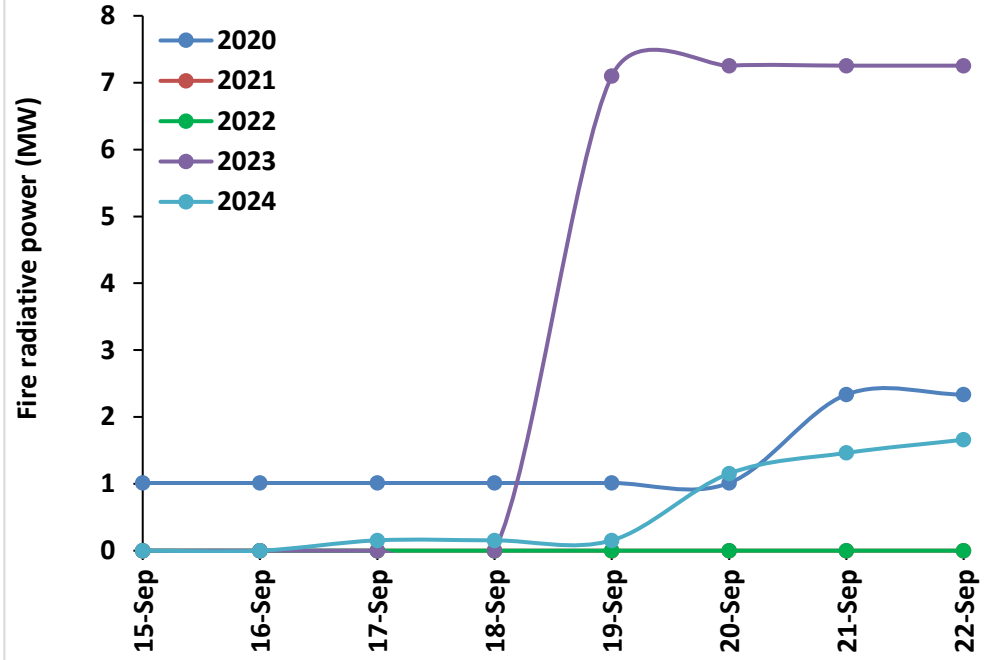
Delhi Cumulative



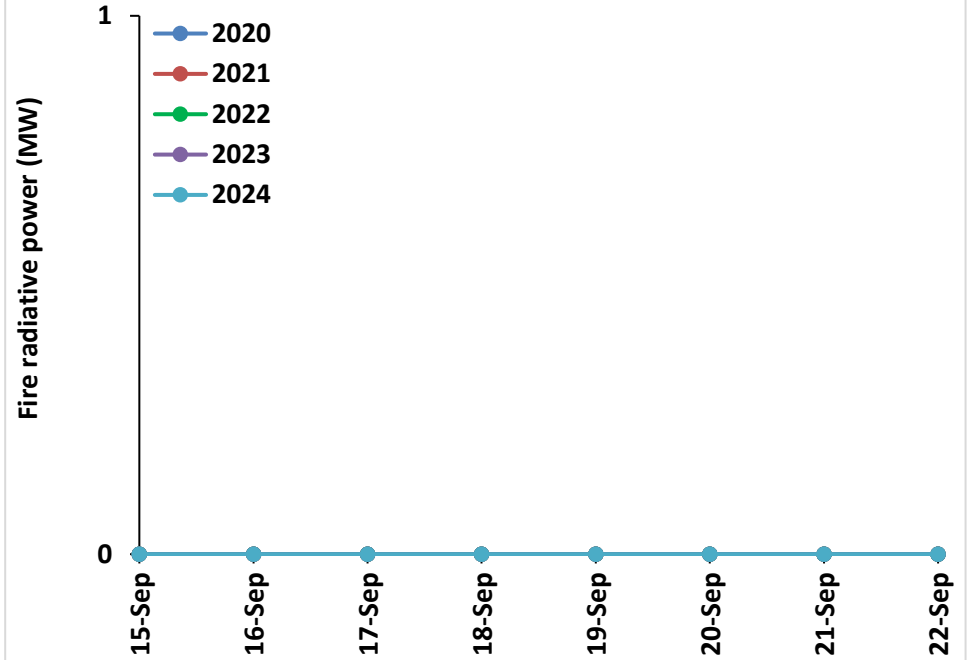
Comparison of residue burning fire power in current year (2024) with previous years (2020,2021,2022 and 2023) for the study States



Madhya Pradesh Cumulative

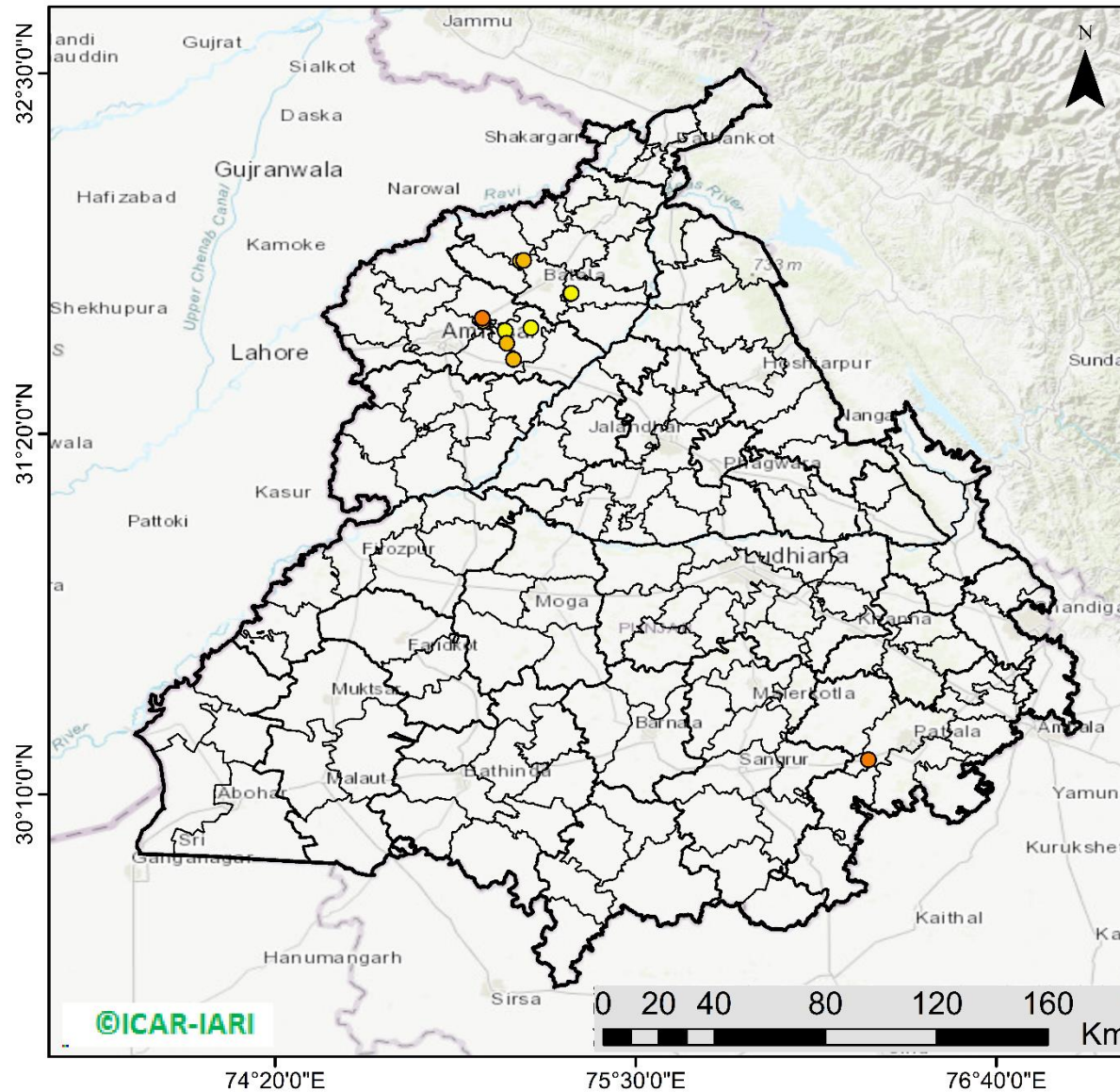


Delhi Cumulative



Punjab

RICE RESIDUE BURNING IN PUNJAB



11 burning events detected in Punjab during (22nd Sep 2024)

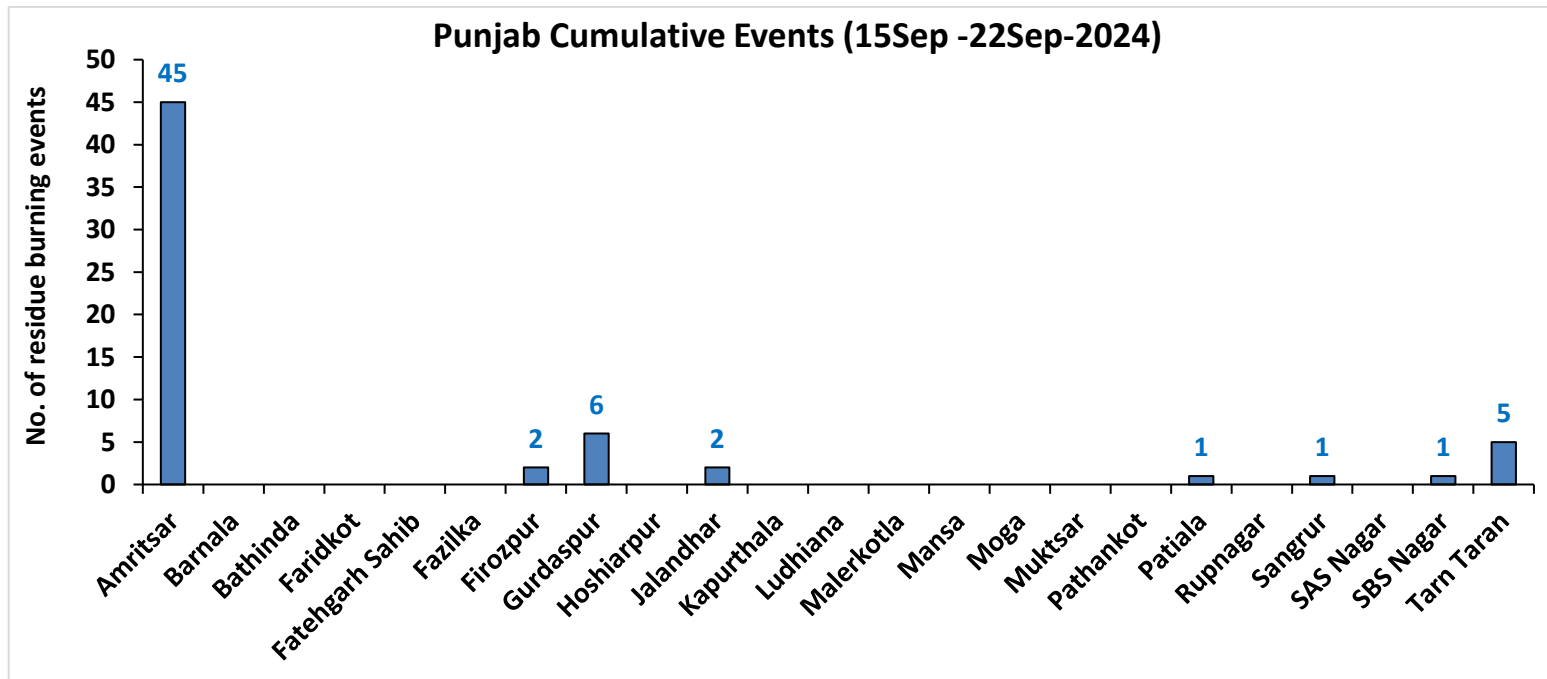
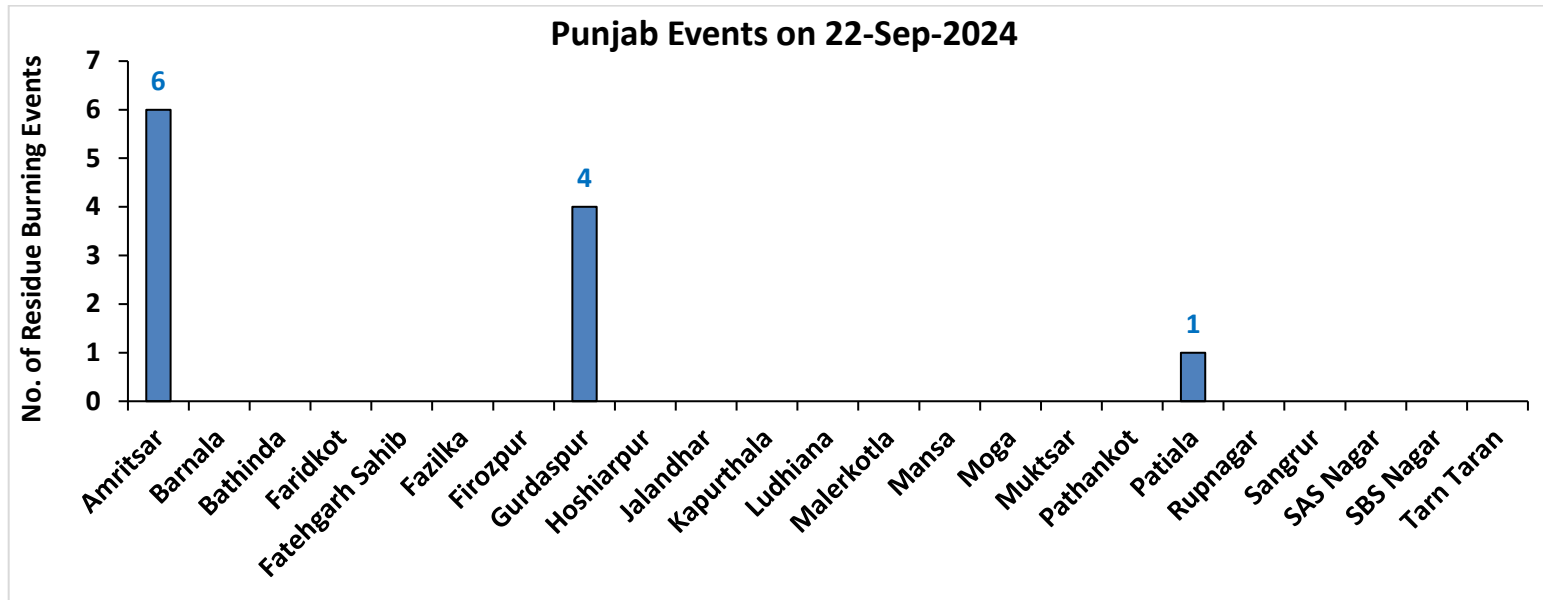
Fire Intensity (W/m²)

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



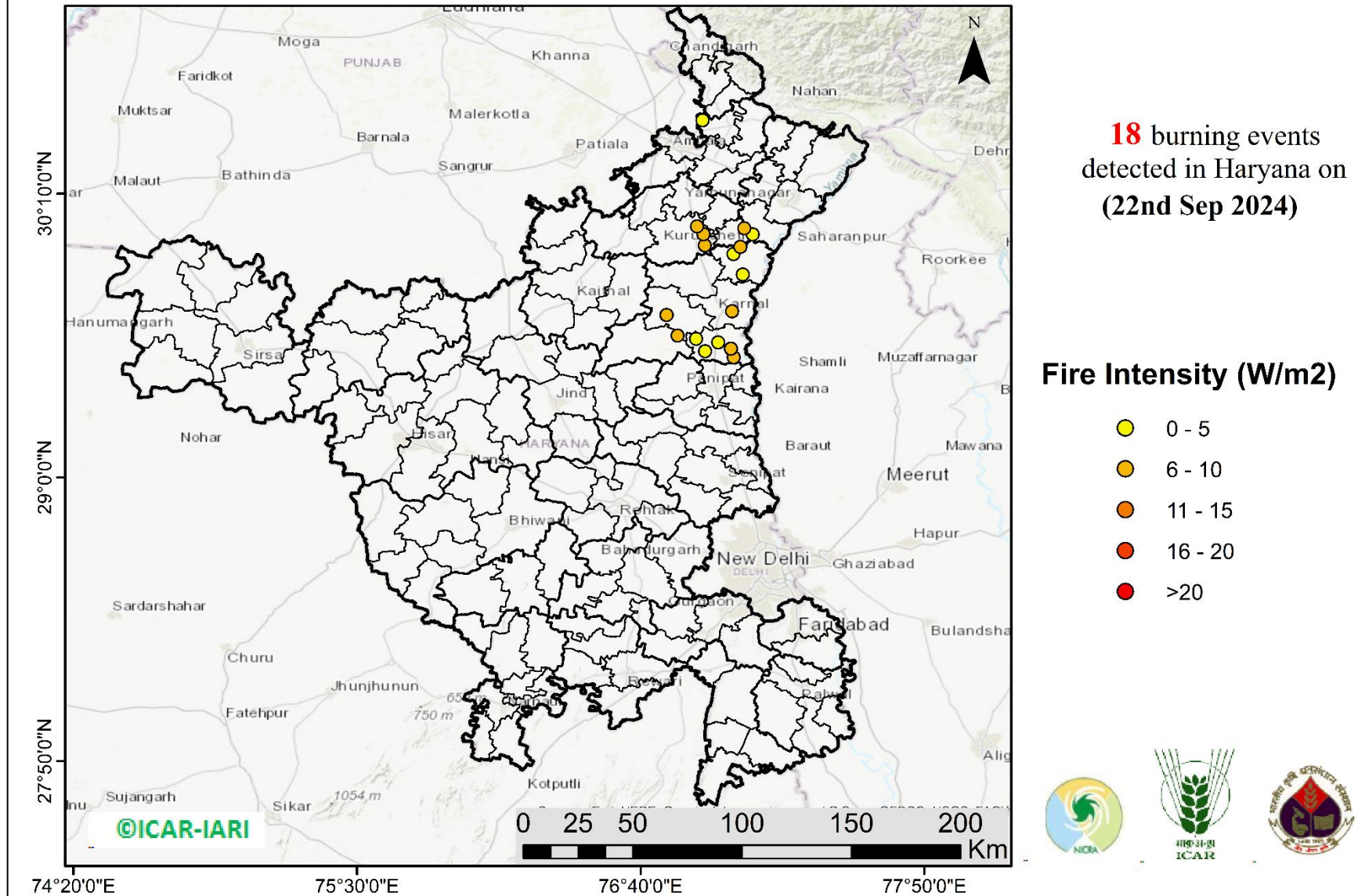
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep-22Sep-2024)



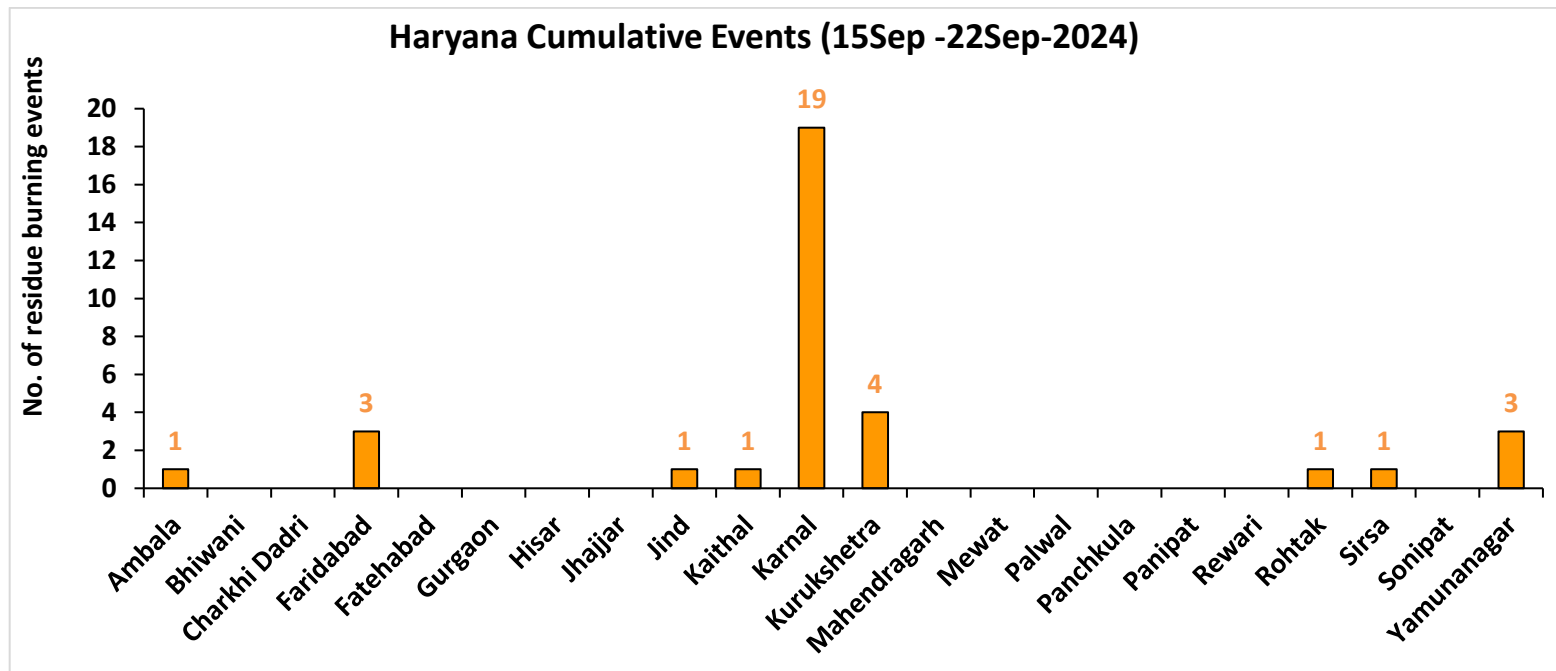
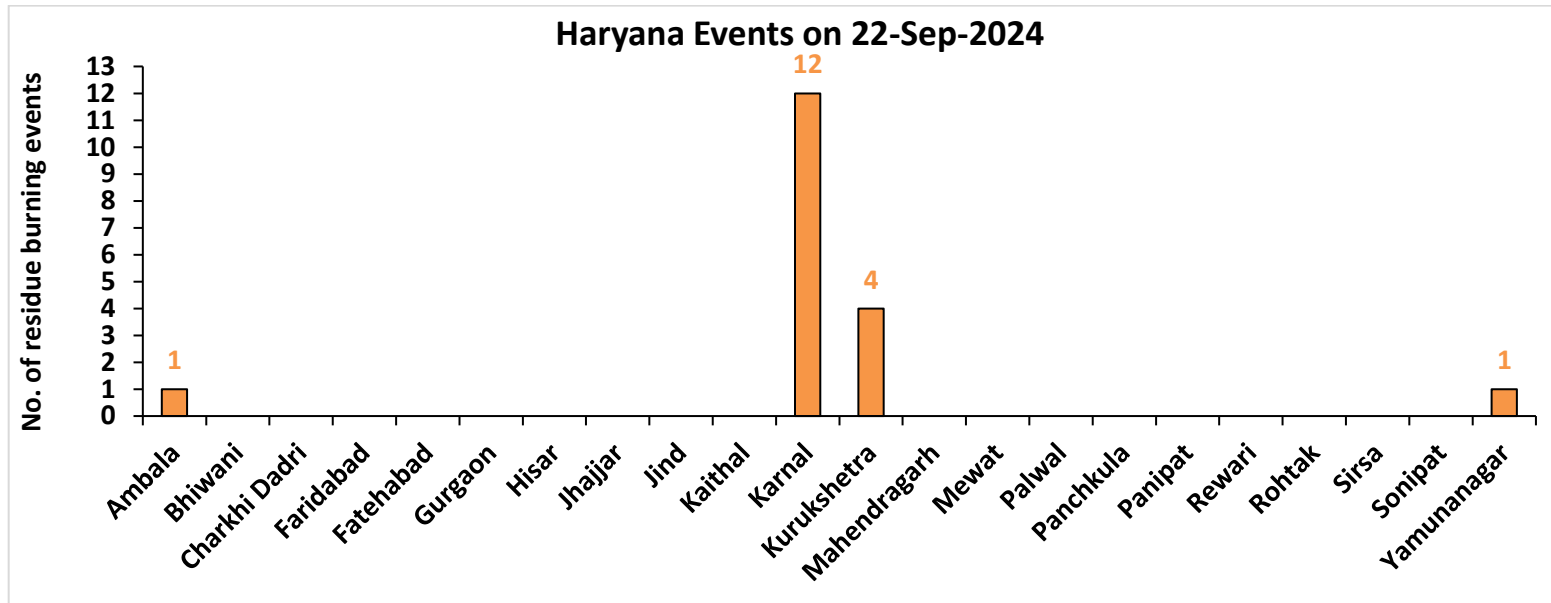
Haryana

RICE RESIDUE BURNING IN HARYANA



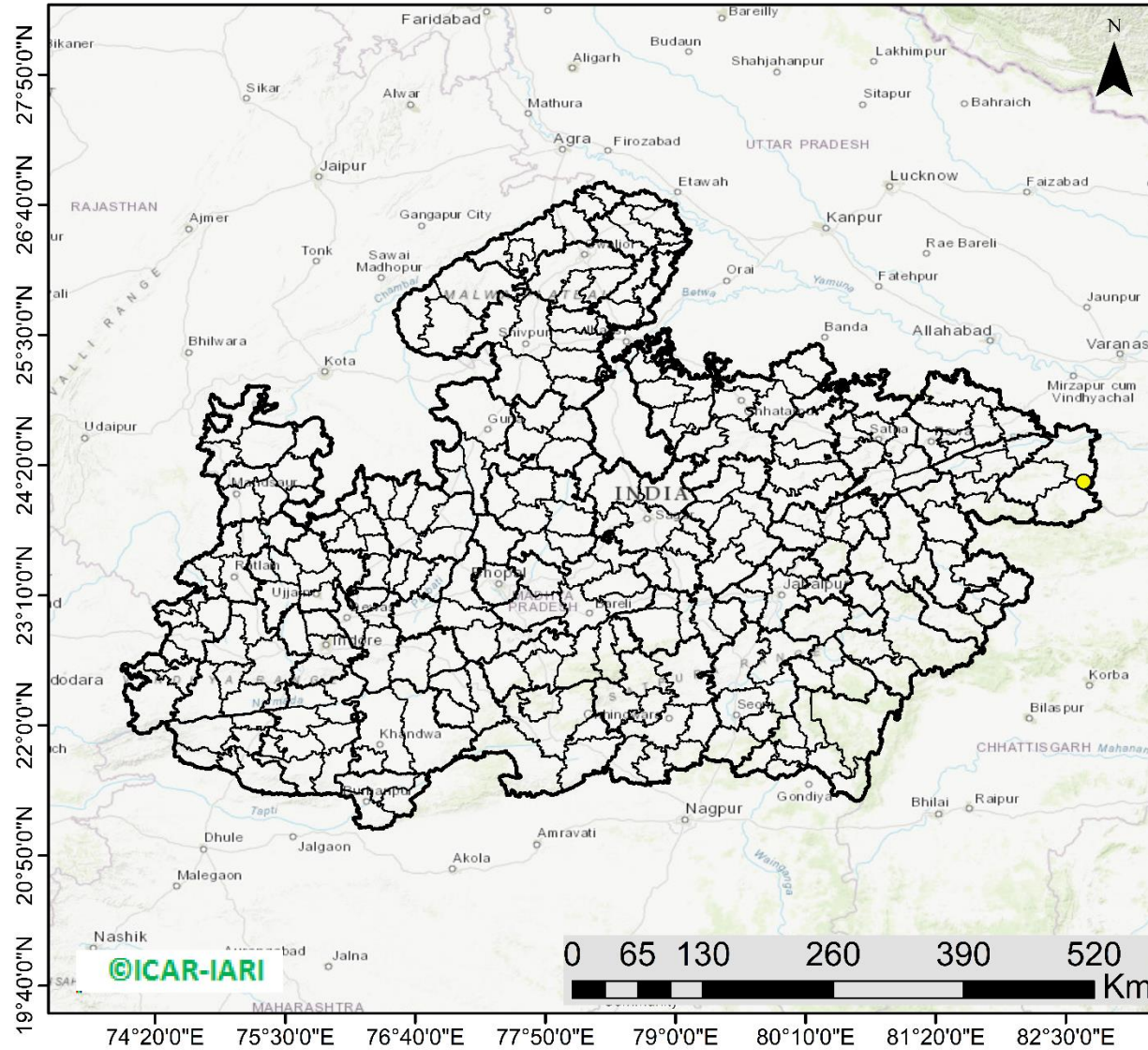
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15Sep-22Sep-2024)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



01 burning events detected in MP on (22nd Sep 2024)

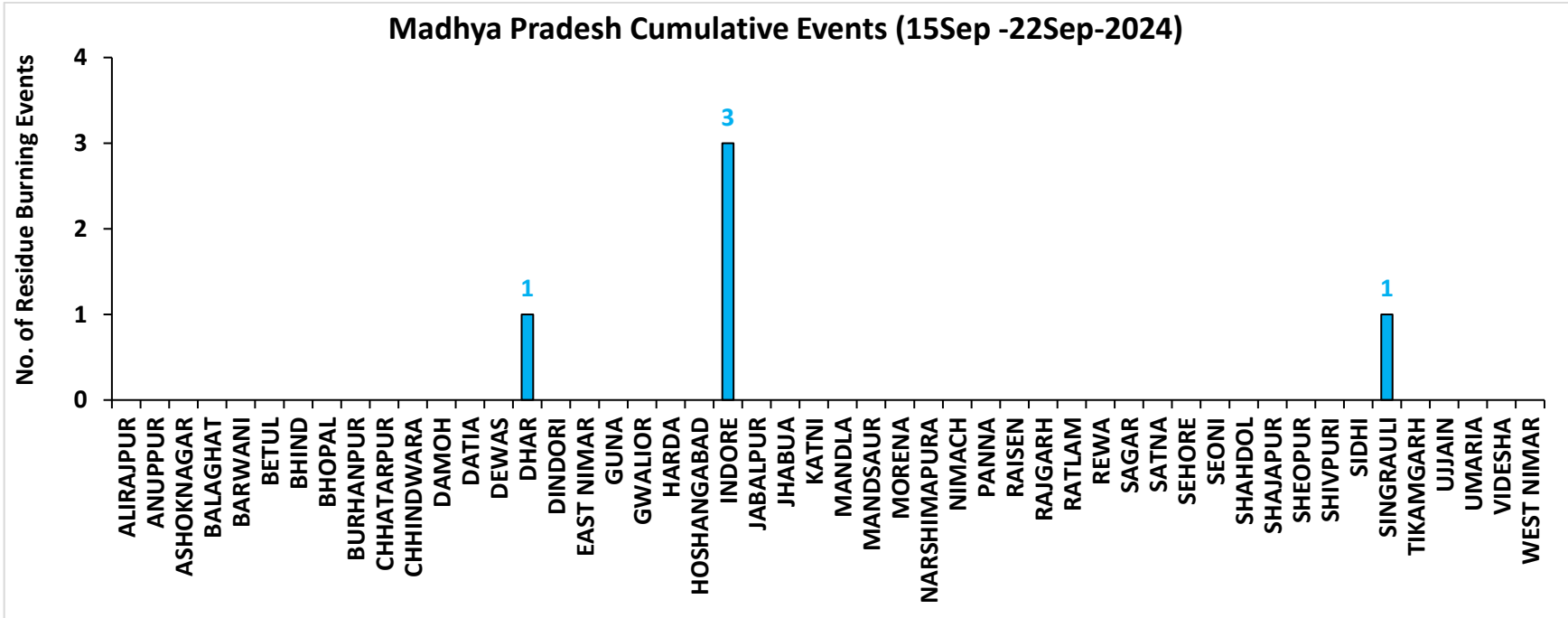
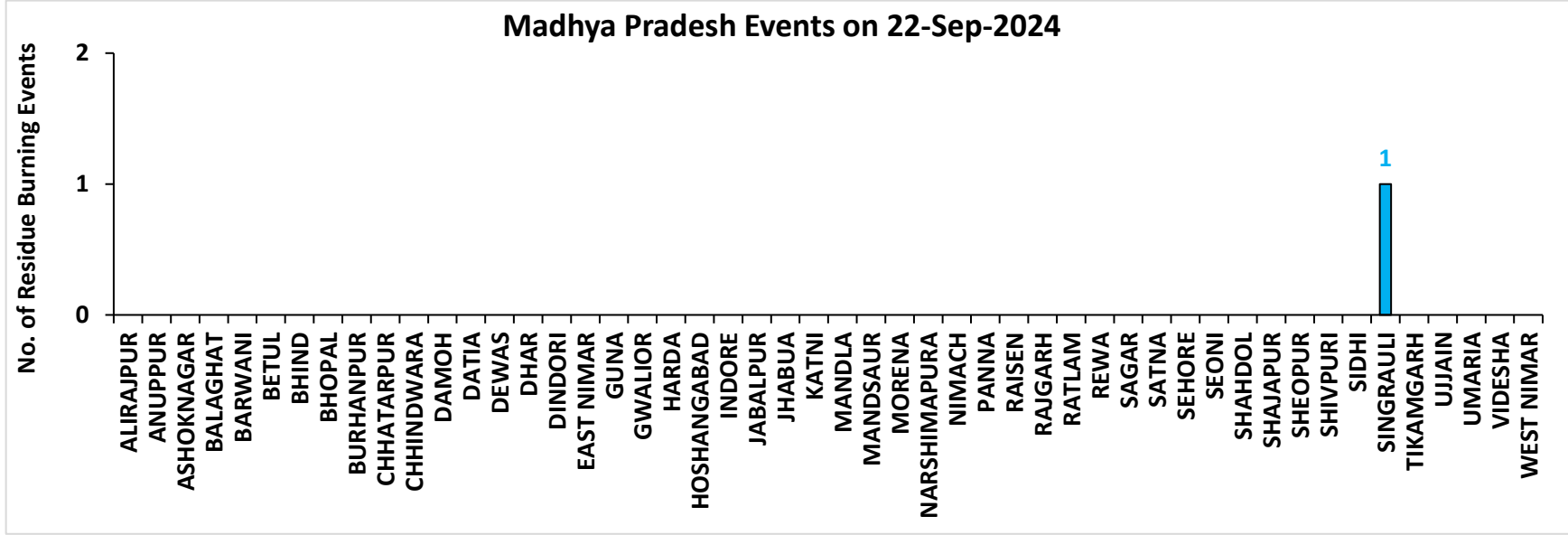
Fire Intensity (W/m²)

- 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-22Sep-2024)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022, 2023 and 2024
(Period: 15 September-22 September)

(a) Punjab

District	15 Sep-22 Sep				
	2020	2021	2022	2023	2024
Amritsar	192	19	119	6	45
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	0	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	0	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	9	1	13	0	5
Total	212	24	136	7	63

(b) Haryana

District	15 Sep-22 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	3
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	2	19
KURUKSHETRA	2	0	0	1	4
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	1
SIRSA	1	0	0	0	1
SONIPAT	0	0	0	2	0
YAMUNANAGAR	0	0	0	1	3
Total	17	0	1	9	34

(c) Uttar Pradesh

District	15 Sep-22 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	0	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	5	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-22 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-22 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	0	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
KARAULI	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	2	0	1	0	0

(f) Madhya Pradesh

District	15 Sep-22 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	1
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	5
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-22 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
Total	212	24	136	7	63	17	0	1	9	34	5	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
Total	0	0	0	0	0	2	0	1	0	0	4	0	0	2	5

Details of residue burning events in Punjab on 22-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	JANDIALA GURU	AQUA	31.57400	75.10500	14:17:54	D	6.90
2	AMRITSAR	JANDIALA GURU	AQUA	31.69800	75.00600	14:17:54	D	8.00
3	AMRITSAR	MAJITHA	AQUA	31.70700	75.00400	14:17:54	D	10.30
4	AMRITSAR	TARSIKKA	S-NPP	31.66696	75.07781	13:03:28	D	4.00
5	AMRITSAR	TARSIKKA	S-NPP	31.67566	75.16158	13:03:28	D	4.40
6	AMRITSAR	TARSIKKA	AQUA	31.62600	75.08300	14:17:54	D	7.00
7	GURDASPUR	BATALA	AQUA	31.89200	75.12700	14:17:54	D	5.60
8	GURDASPUR	BATALA	AQUA	31.89400	75.13800	14:17:54	D	9.30
9	GURDASPUR	QADIAN	S-NPP	31.78643	75.28906	13:03:28	D	2.10
10	GURDASPUR	QADIAN	S-NPP	31.78742	75.29138	13:03:28	D	3.10
11	PATIALA	PATIALA	AQUA	30.27800	76.25300	14:17:54	D	13.80

Details of residue burning events in Haryana on 22-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMBALA	SHAHZADPUR	S-NPP	30.46791	76.92130	13:03:28	D	3.10
2	KARNAL	ASSANDH	S-NPP	29.58233	76.81898	13:03:28	D	6.10
3	KARNAL	CHIRAO	S-NPP	29.66679	76.77291	13:03:28	D	7.20
4	KARNAL	CHIRAO	S-NPP	29.66698	76.77399	13:03:28	D	5.20
5	KARNAL	GHARAUNDA	S-NPP	29.49298	77.04951	13:03:28	D	8.40
6	KARNAL	GHARAUNDA	S-NPP	29.52821	77.03848	13:03:28	D	7.90
7	KARNAL	GHARAUNDA	S-NPP	29.55421	76.98591	13:03:28	D	2.90
8	KARNAL	GHARAUNDA	AQUA	29.51800	76.93200	14:17:54	D	4.70
9	KARNAL	GHARAUNDA	AQUA	29.56900	76.89500	14:17:54	D	4.80
10	KARNAL	INDRI	S-NPP	29.83350	77.08685	13:03:28	D	2.80
11	KARNAL	INDRI	S-NPP	29.91777	77.04875	13:03:28	D	3.10
12	KARNAL	INDRI	AQUA	29.94700	77.07700	14:17:54	D	6.50
13	KARNAL	KARNAL	AQUA	29.68200	77.04300	14:17:54	D	6.20
14	KURUKSHETRA	LADWA	S-NPP	30.02386	77.09332	13:03:28	D	7.90
15	KURUKSHETRA	THANESAR	AQUA	29.95300	76.93100	14:17:54	D	8.30
16	KURUKSHETRA	THANESAR	AQUA	29.99900	76.92600	14:17:54	D	7.80
17	KURUKSHETRA	THANESAR	AQUA	30.03100	76.89900	14:17:54	D	5.60
18	YAMUNANAGAR	RADAUR	S-NPP	29.99872	77.12772	13:03:28	D	3.00

Details of residue burning events in Madhya Pradesh on 22-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	SINGRAULI	SINGRAULI	S-NPP	24.18283	82.66130	01:53:28	N	1.40

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](#)
