

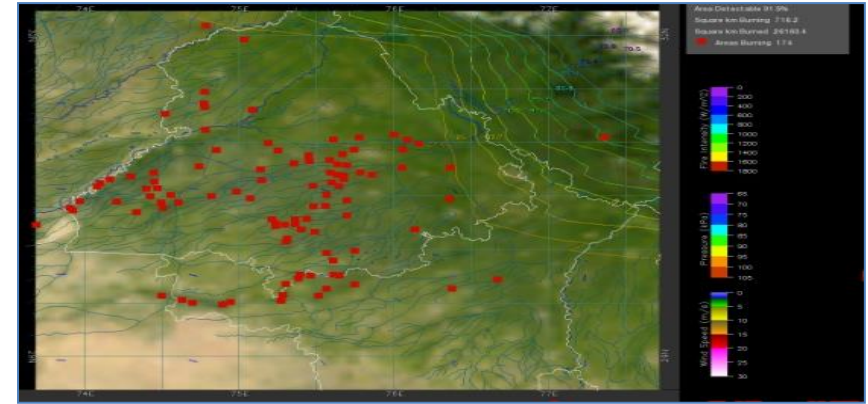
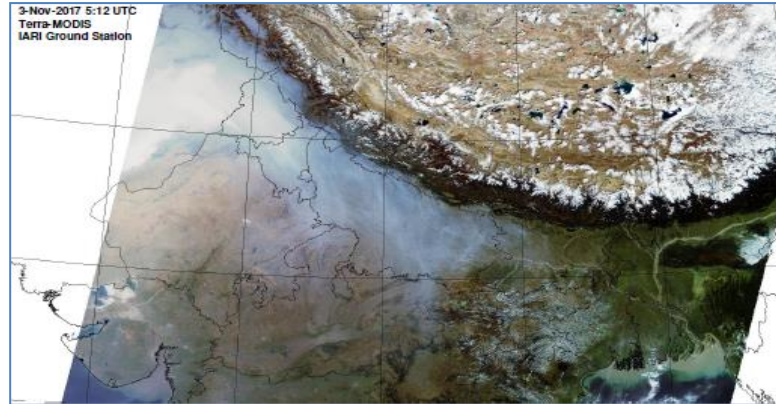


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2024

**Bulletin
No. 07**

**Events Date:
21-Sep-2024**

**Issued on:
21-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

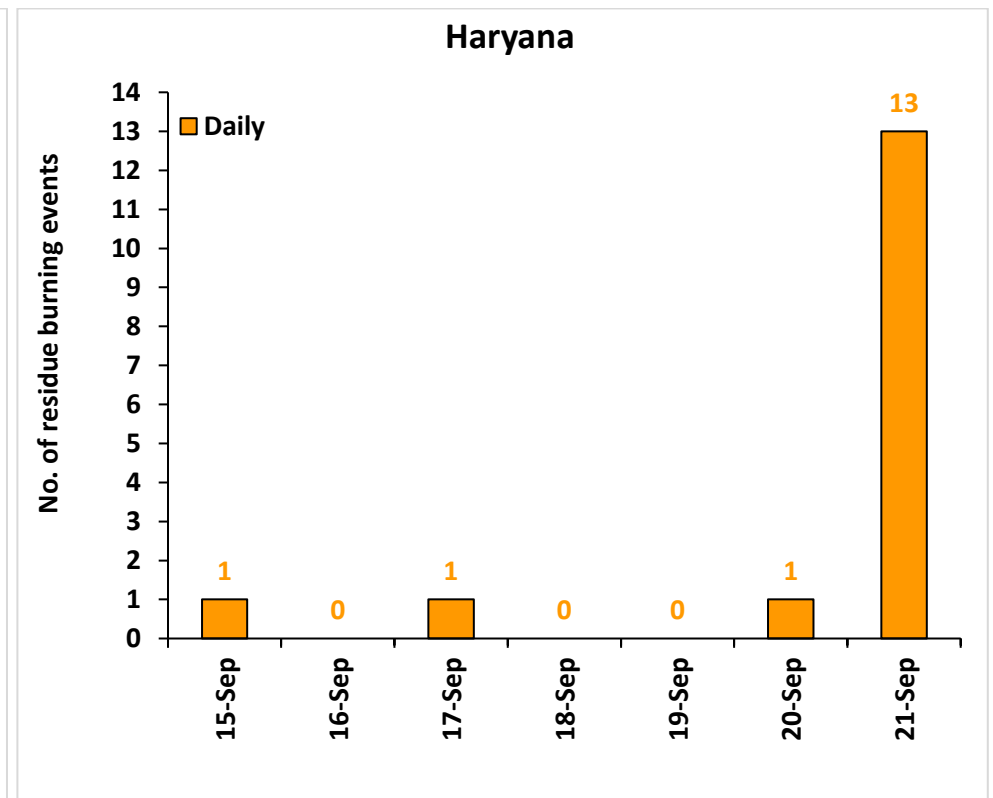
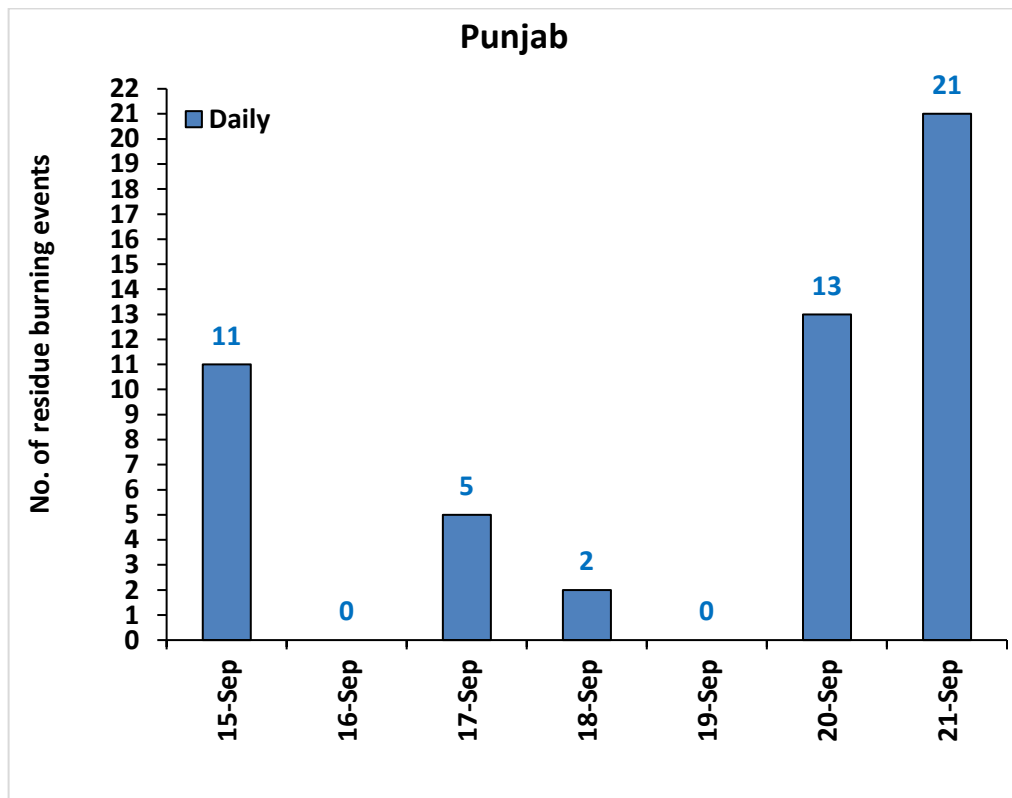
<https://creams.iari.res.in>



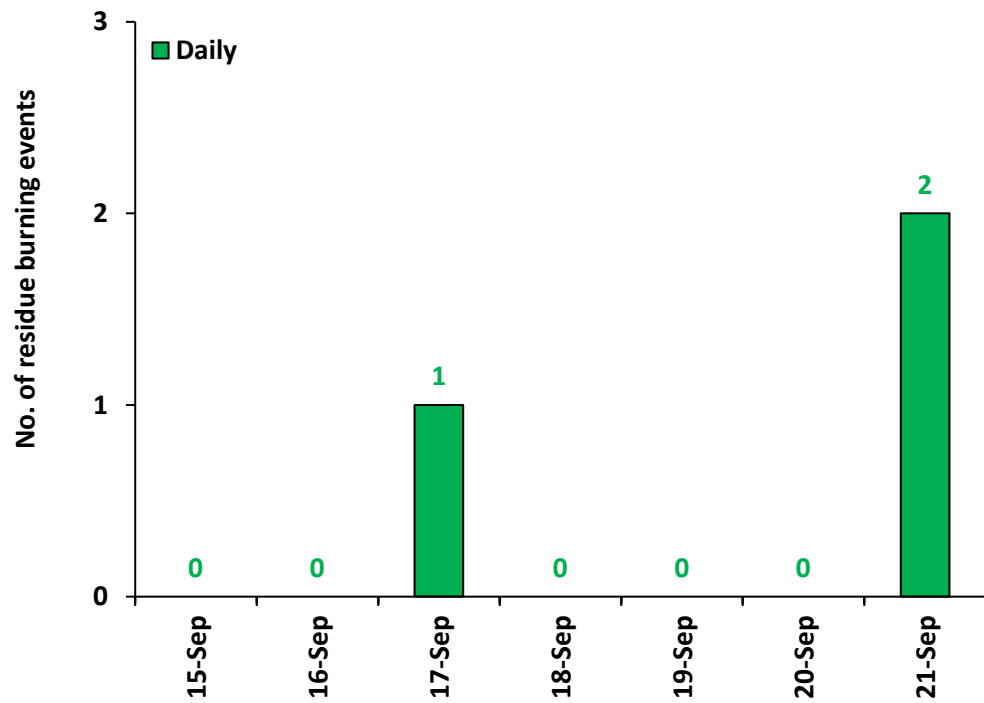
Highlights for 21-Sep-2024

- 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 **37** residue burning events in the six study States on **21-Sep-2024**.
- The state wise events detected on **21-Sep-2024** were **21** in Punjab, **13** in Haryana, **02** 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 Rajasthan and Madhya Pradesh states.

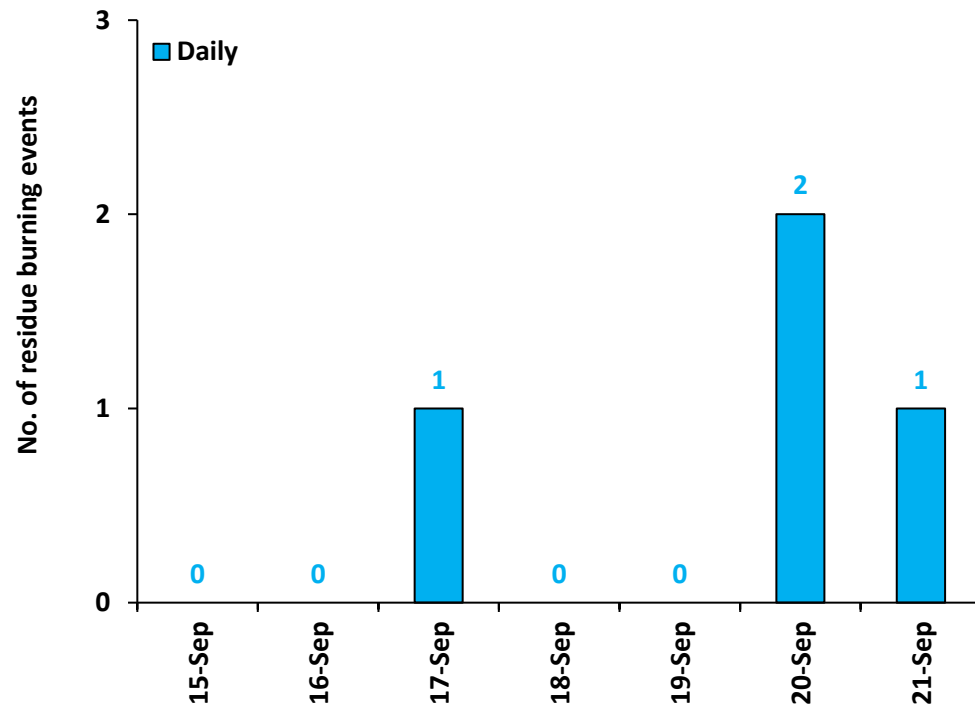
Temporal distribution of rice residue burning events for the study States in 2024



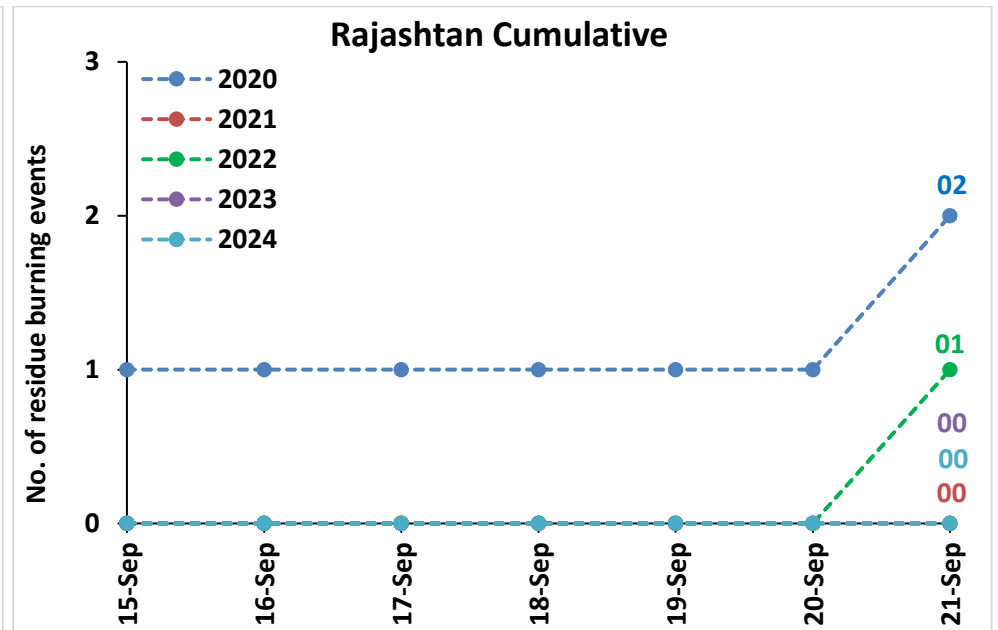
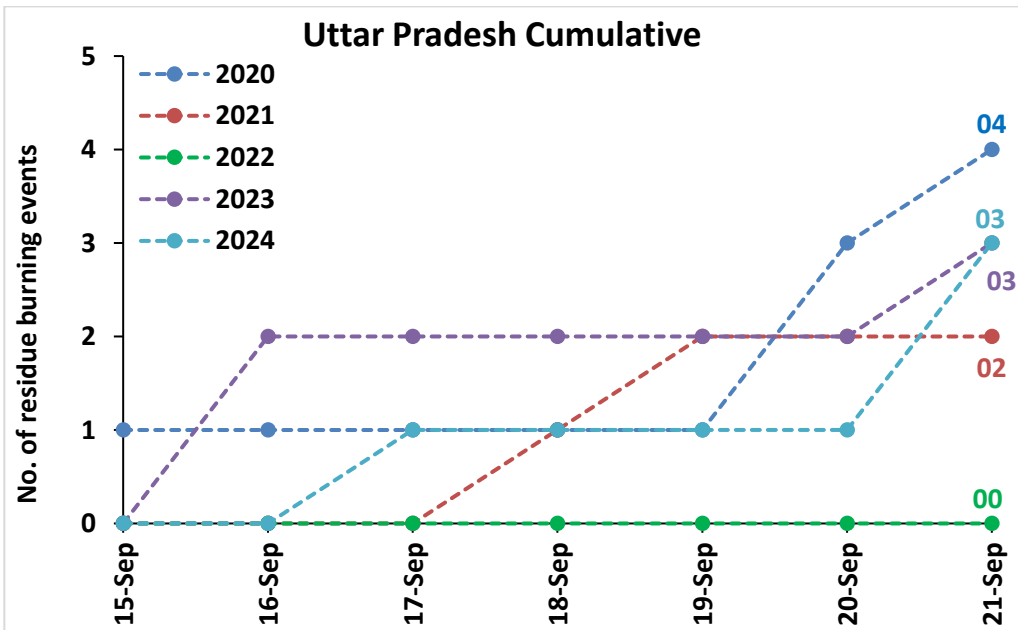
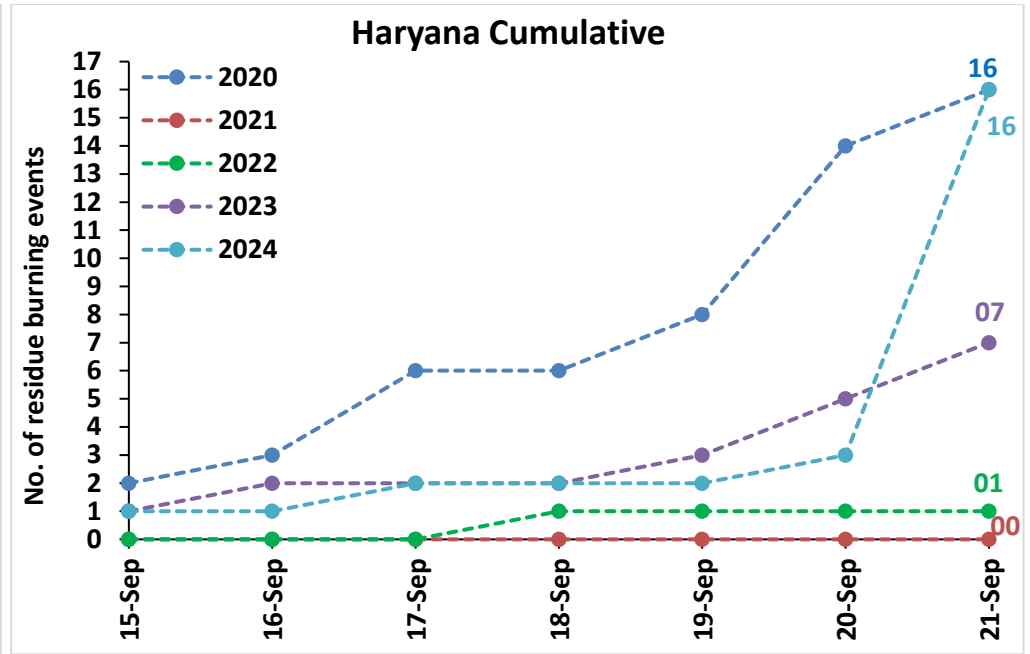
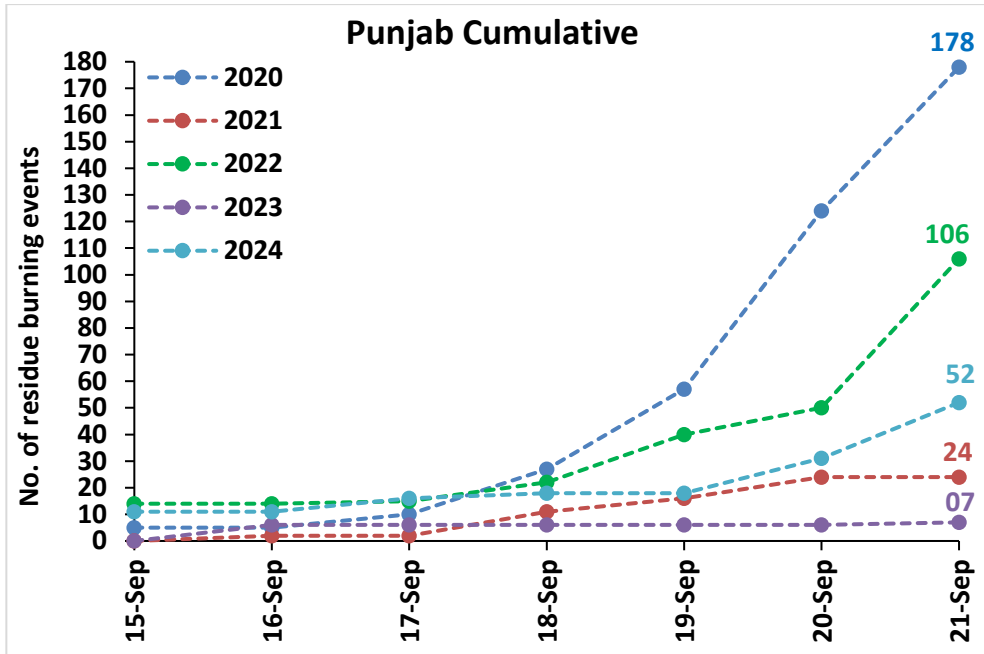
Uttar Pradesh



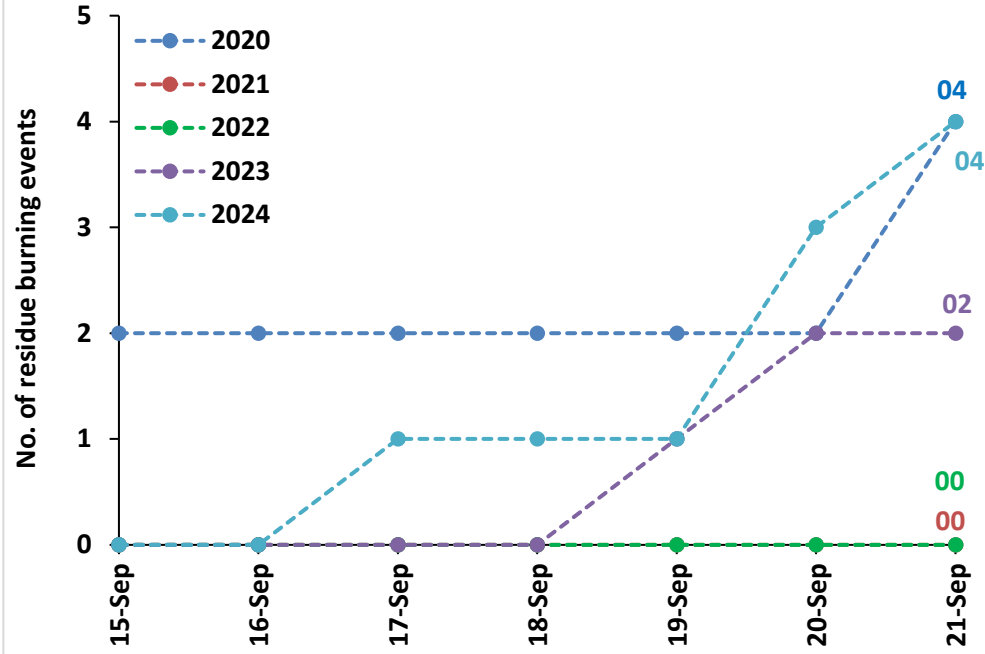
Madhya Pradesh



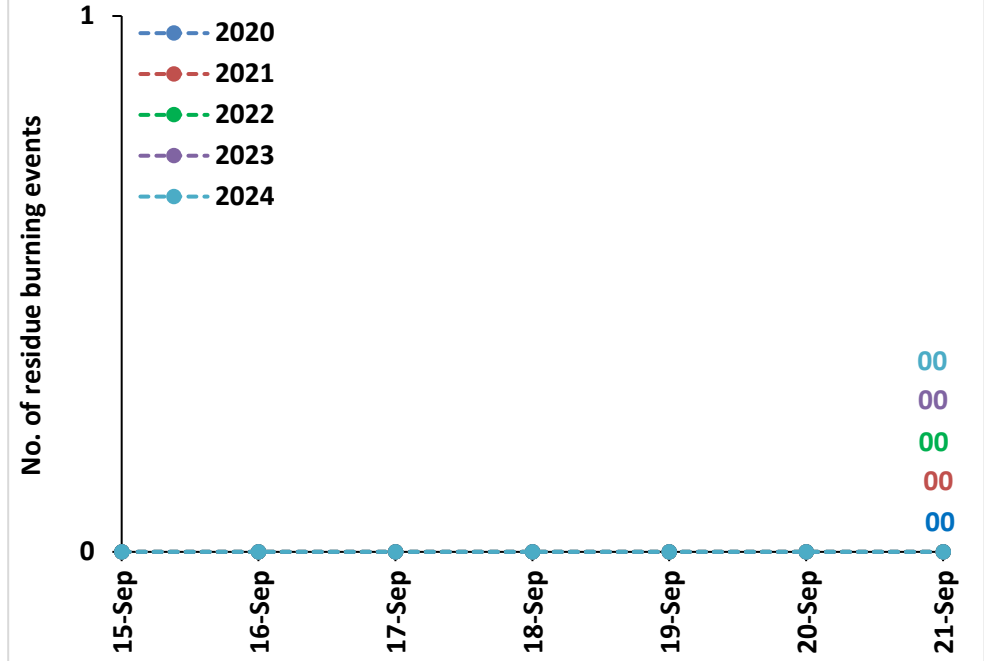
Comparison of residue burning events in current year (2024) with previous years (2020, 2021, 2022 and 2023) for the study States



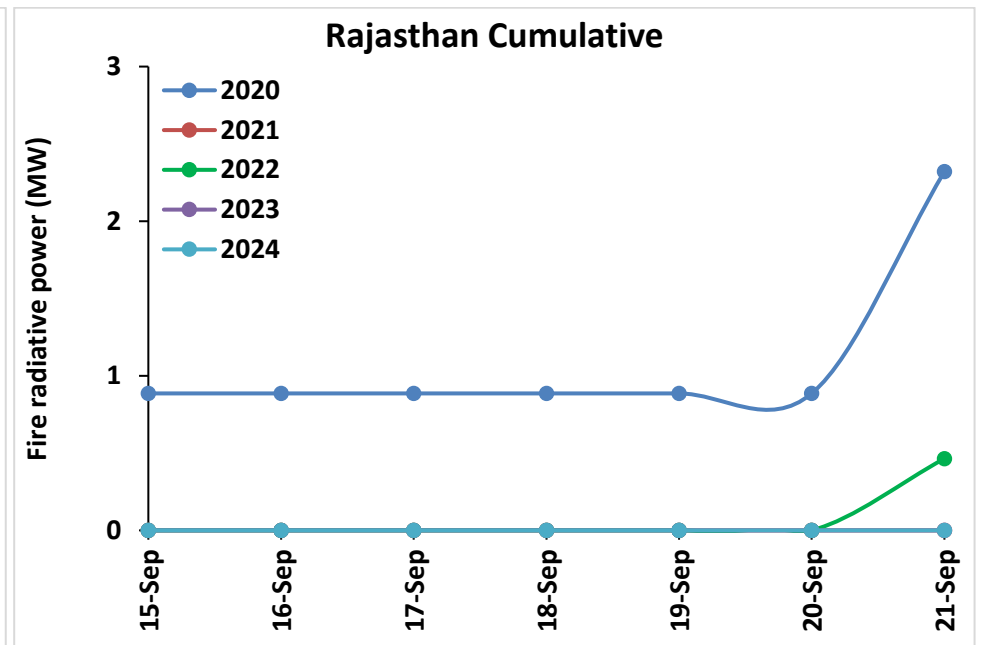
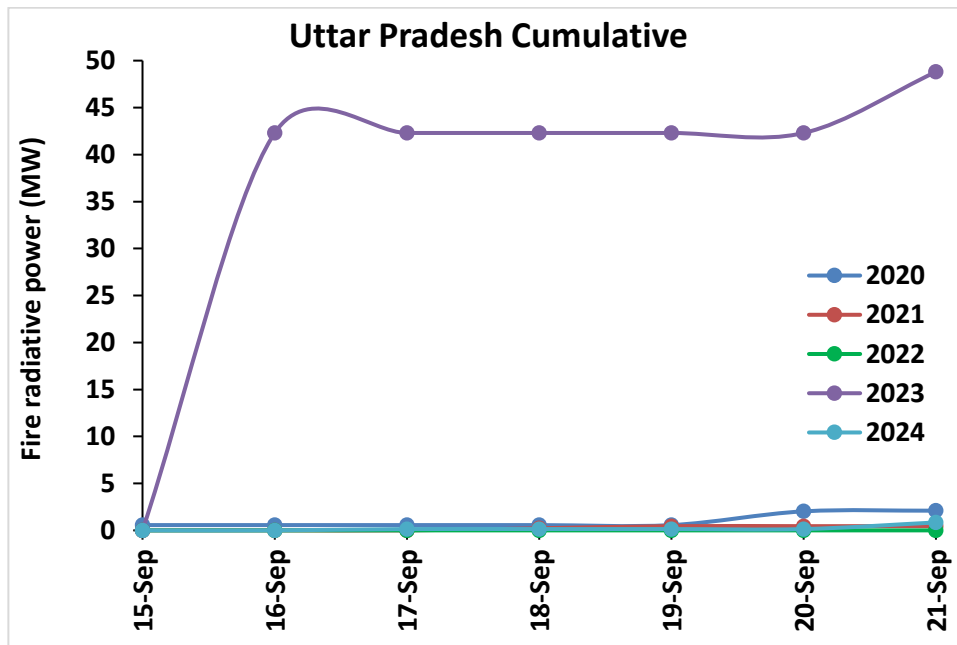
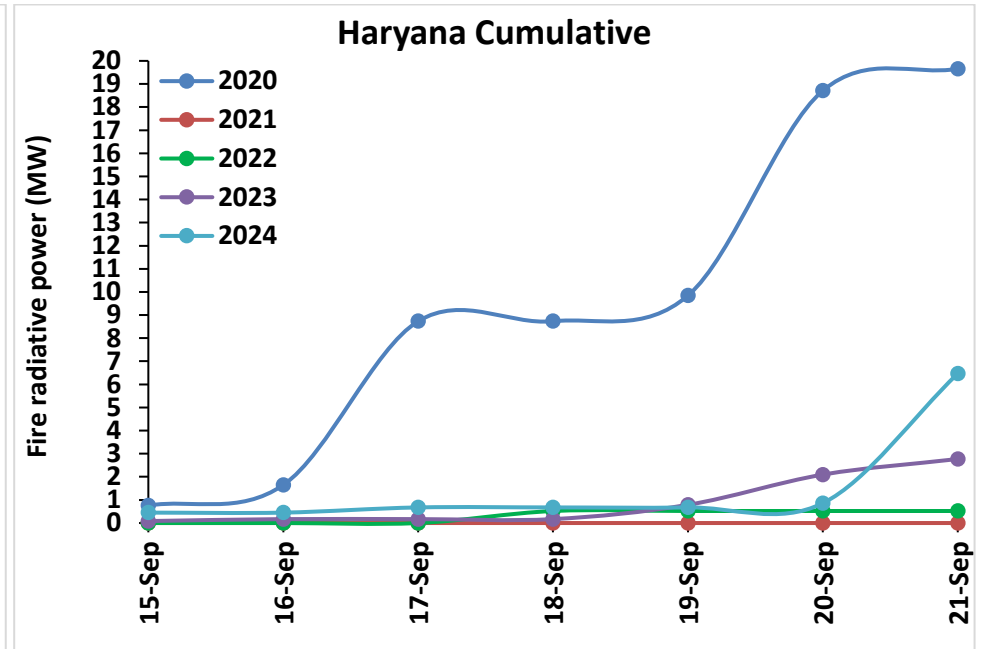
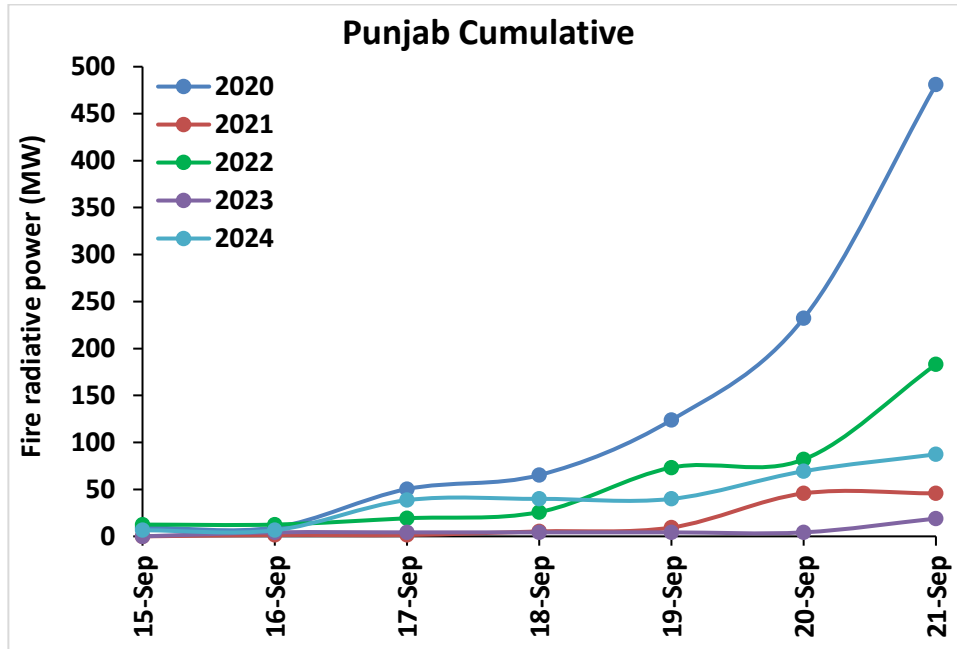
Madhya Pradesh Cumulative



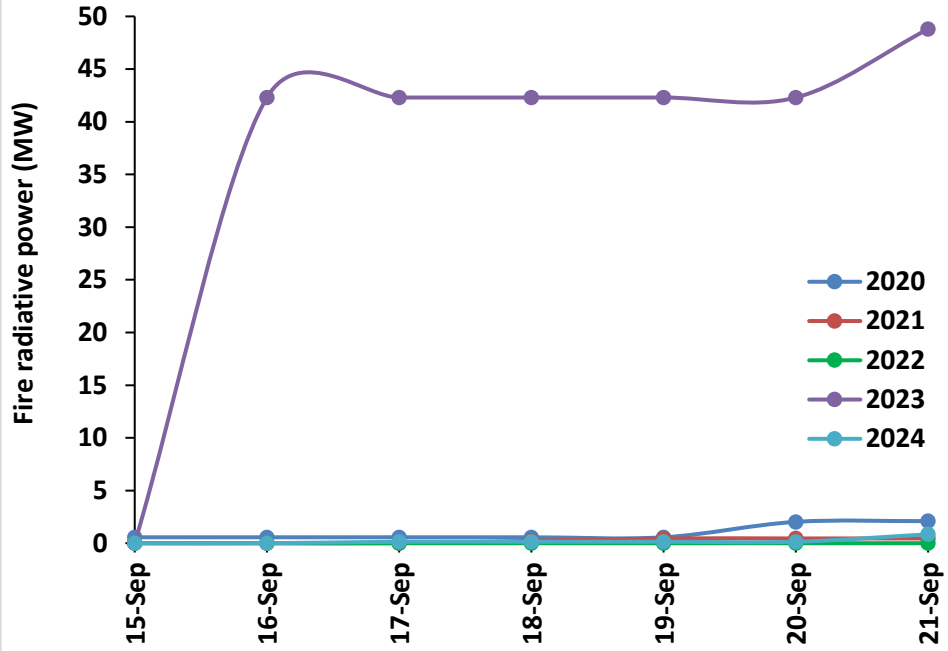
Delhi Cumulative



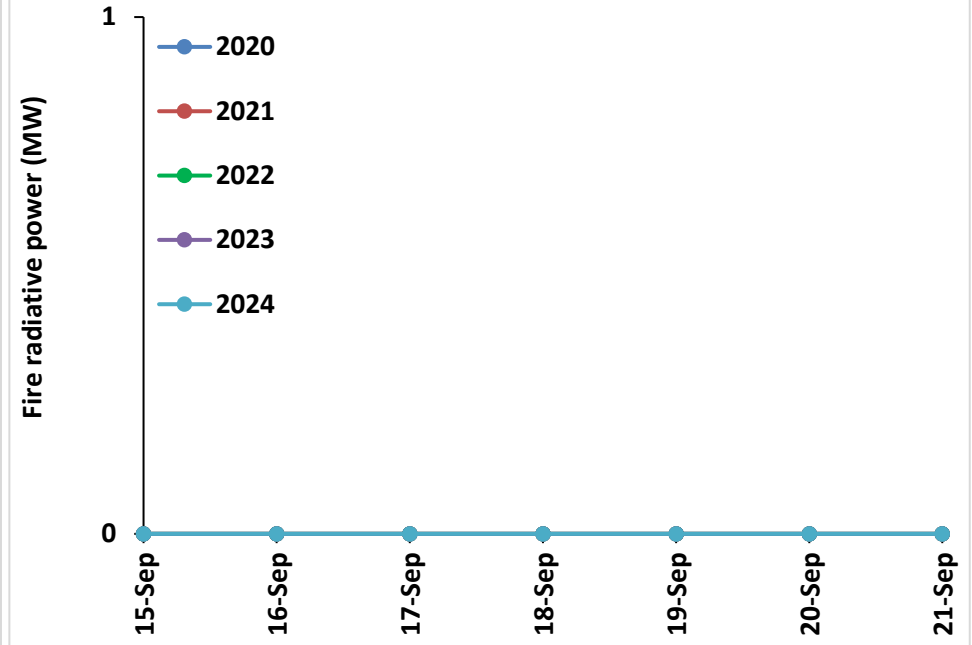
Comparison of residue burning fire power in current year (2024) with previous years (2020,2021,2022 and 2023) for the study States



Uttar Pradesh Cumulative

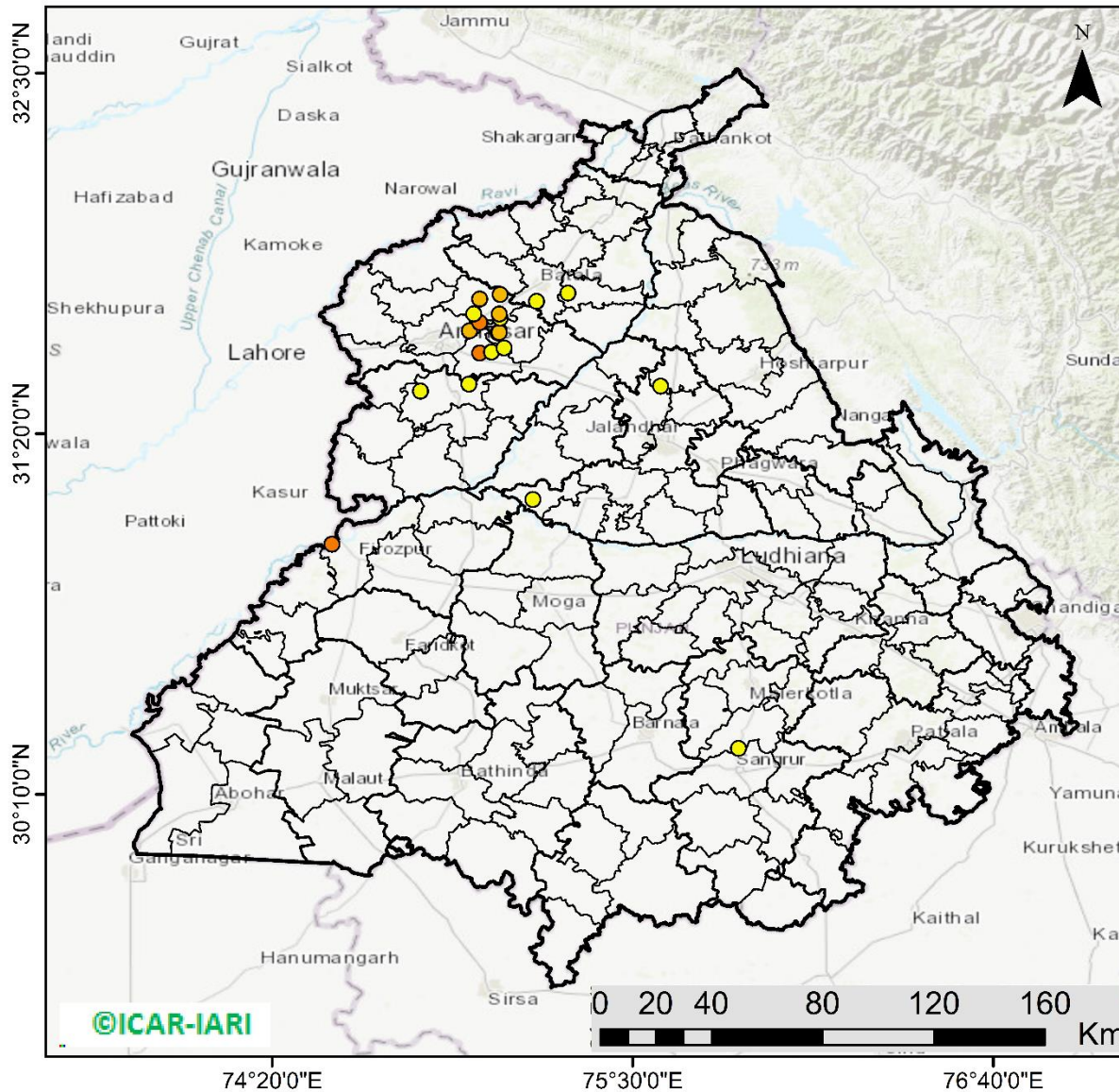


Delhi Cumulative



Punjab

RICE RESIDUE BURNING IN PUNJAB



21 burning events detected in Punjab during (21th Sep 2024)

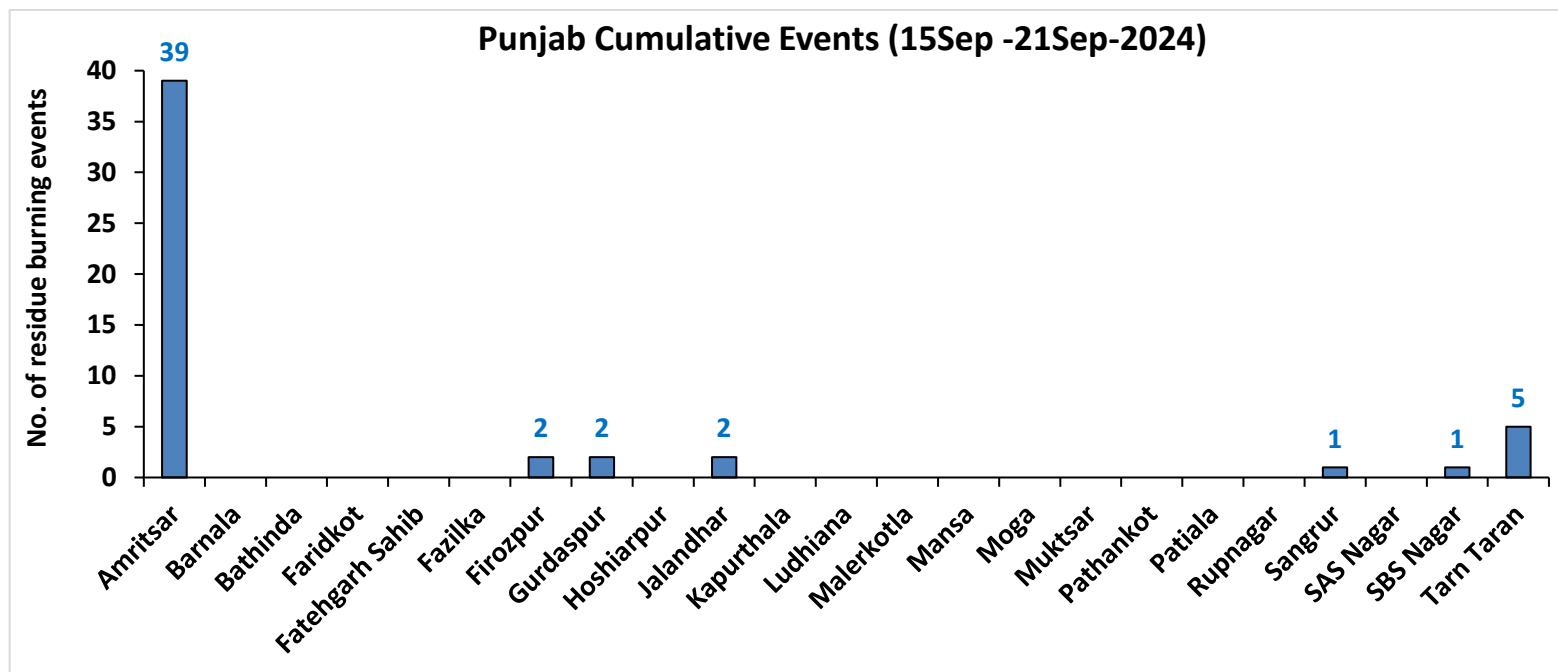
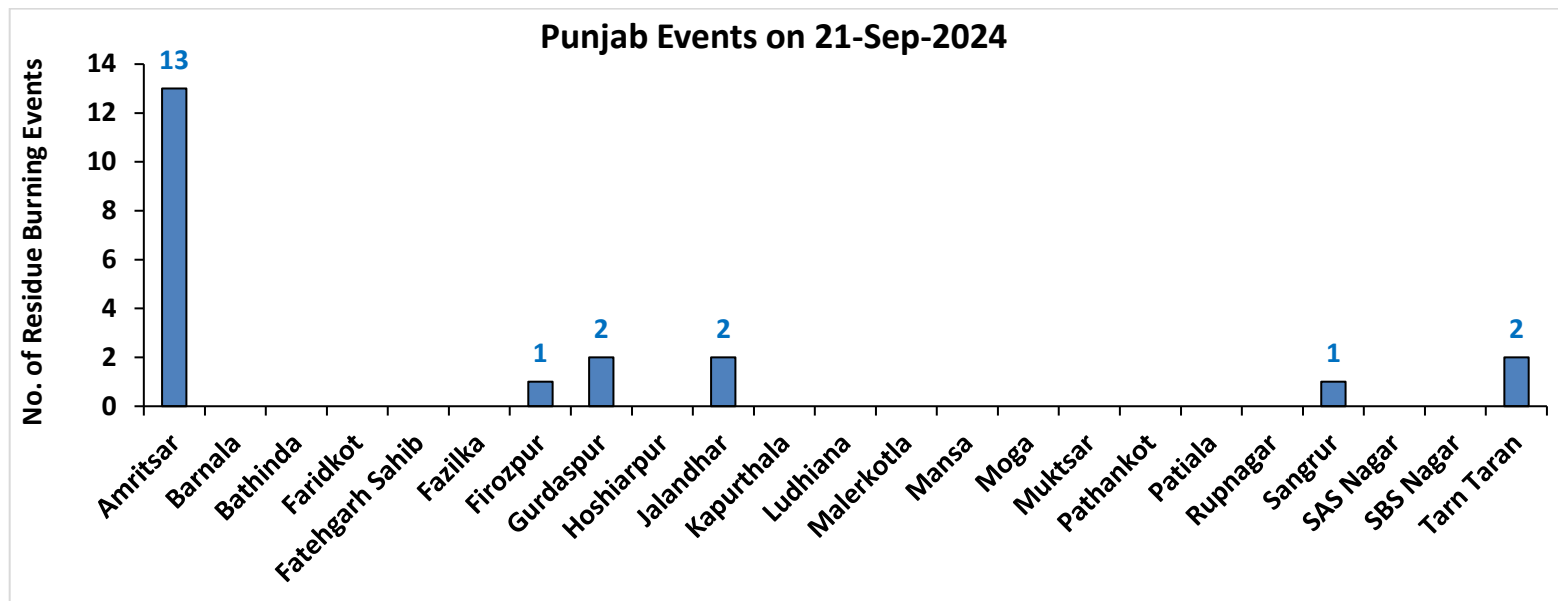
Fire Intensity (W/m2)

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



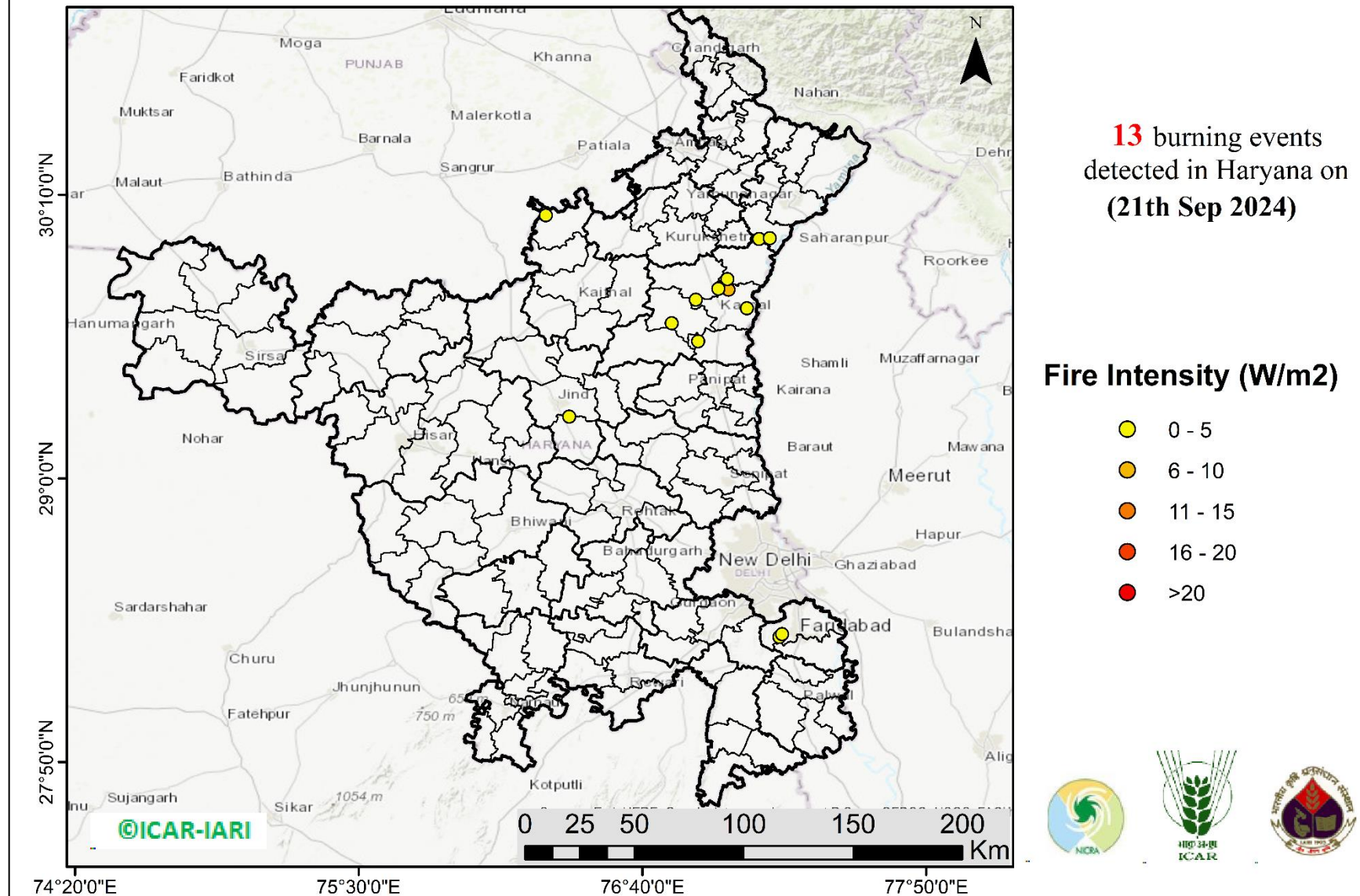
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep-21Sep-2024)



Haryana

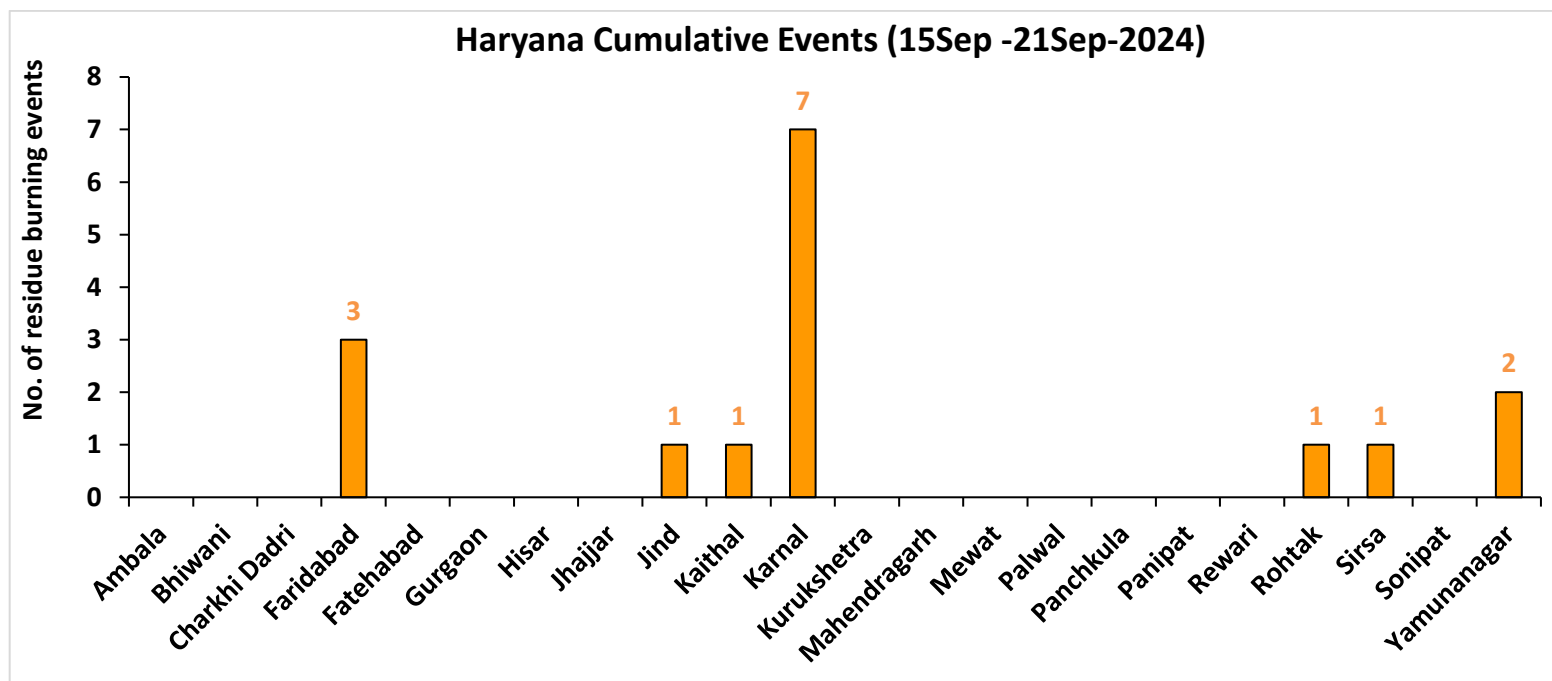
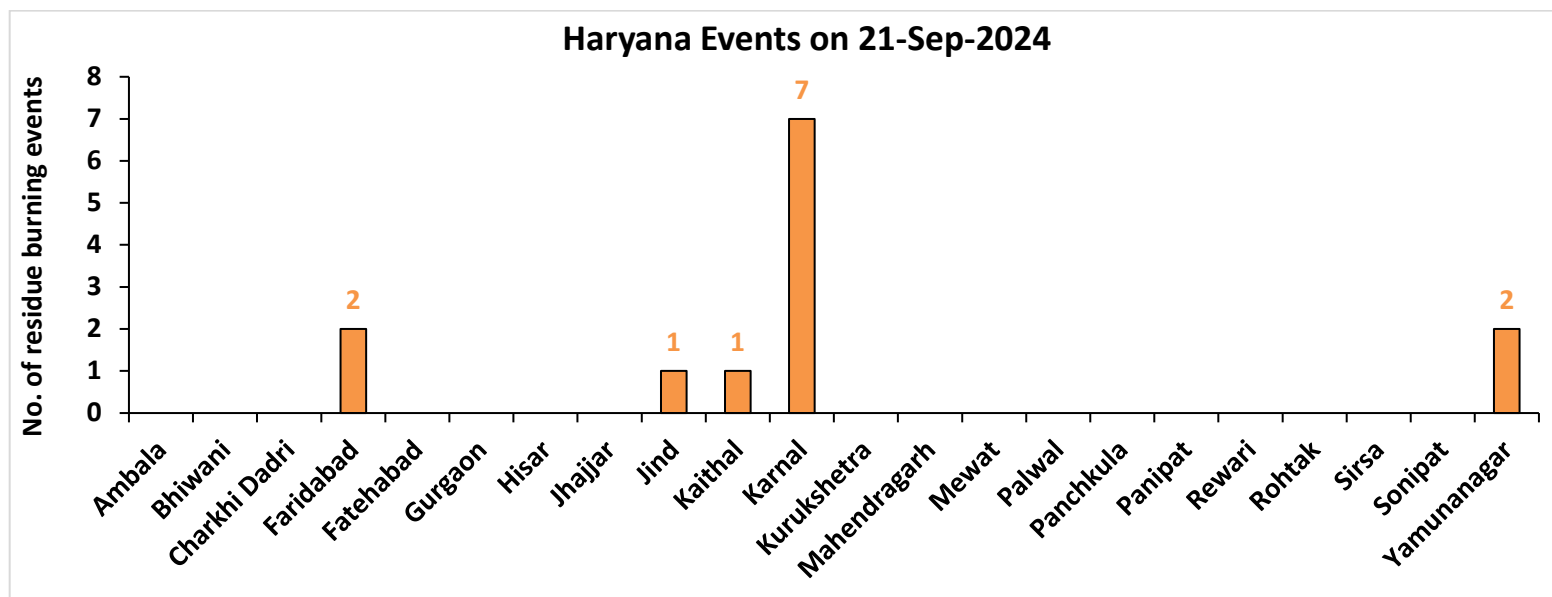
RICE RESIDUE BURNING IN HARYANA



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

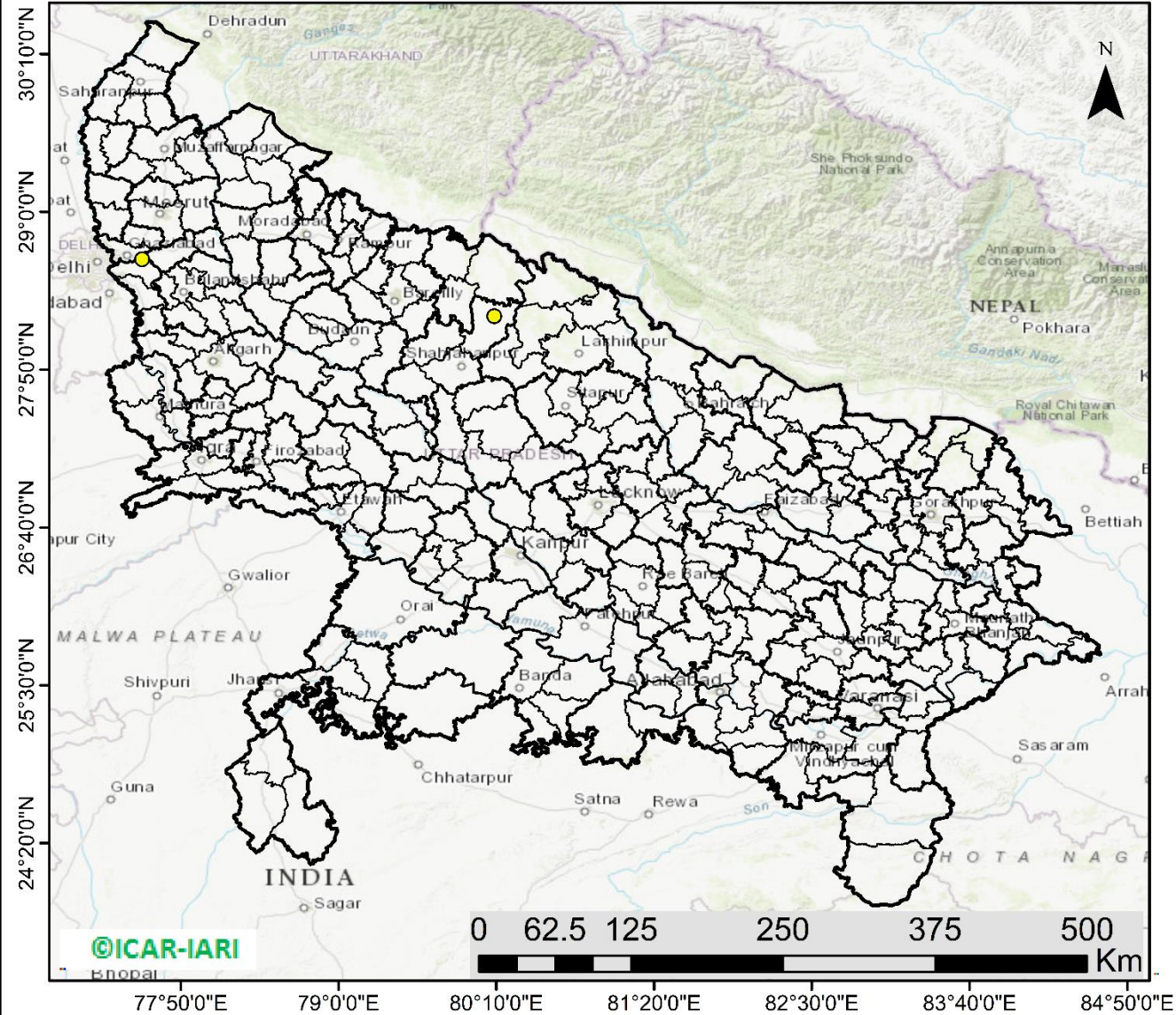


District-wise cumulative number of residues burning events in Haryana (15Sep-21Sep-2024)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH

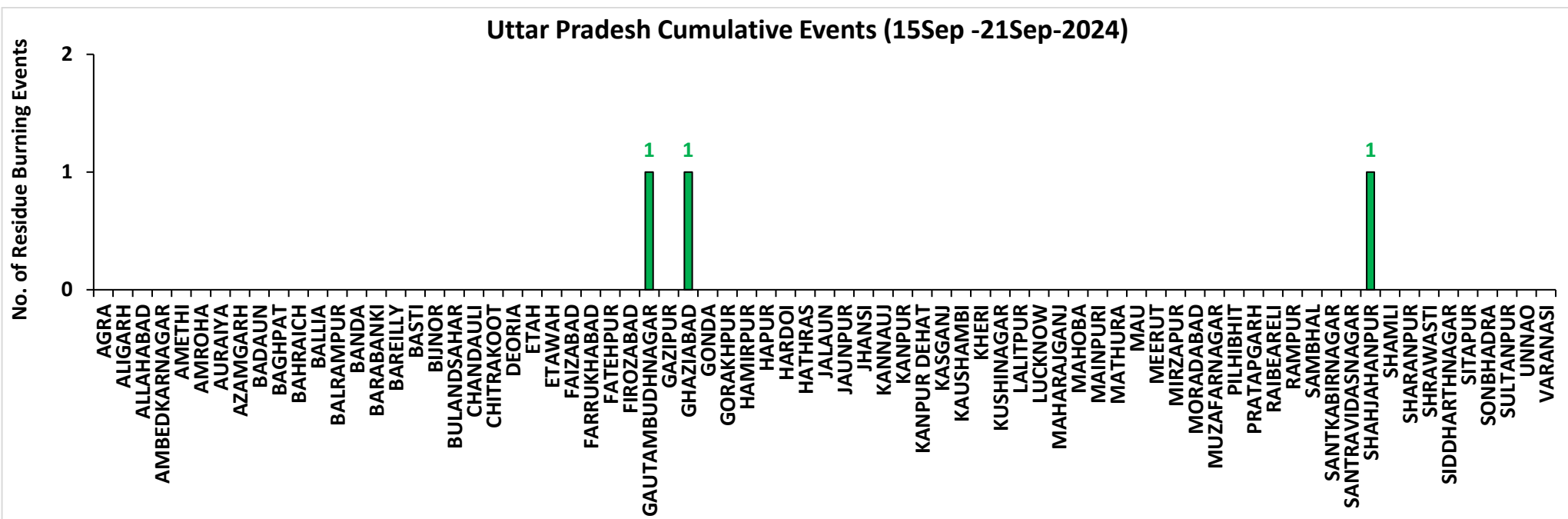
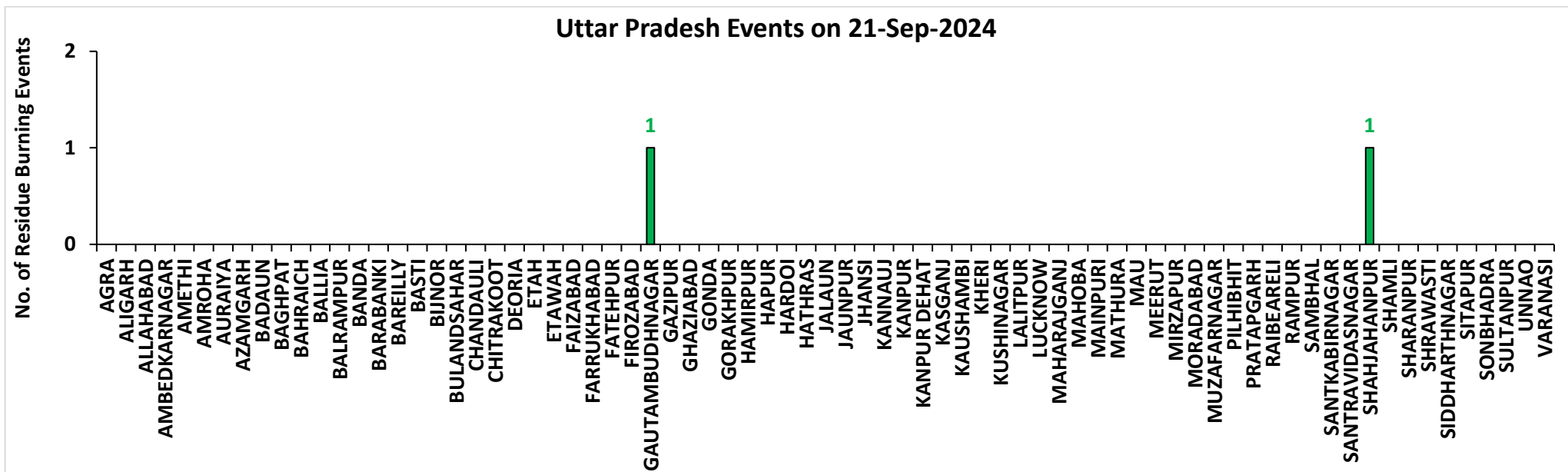


02 burning events detected in Uttar Pradesh on (21th Sep 2024)

Fire Intensity (W/m²)

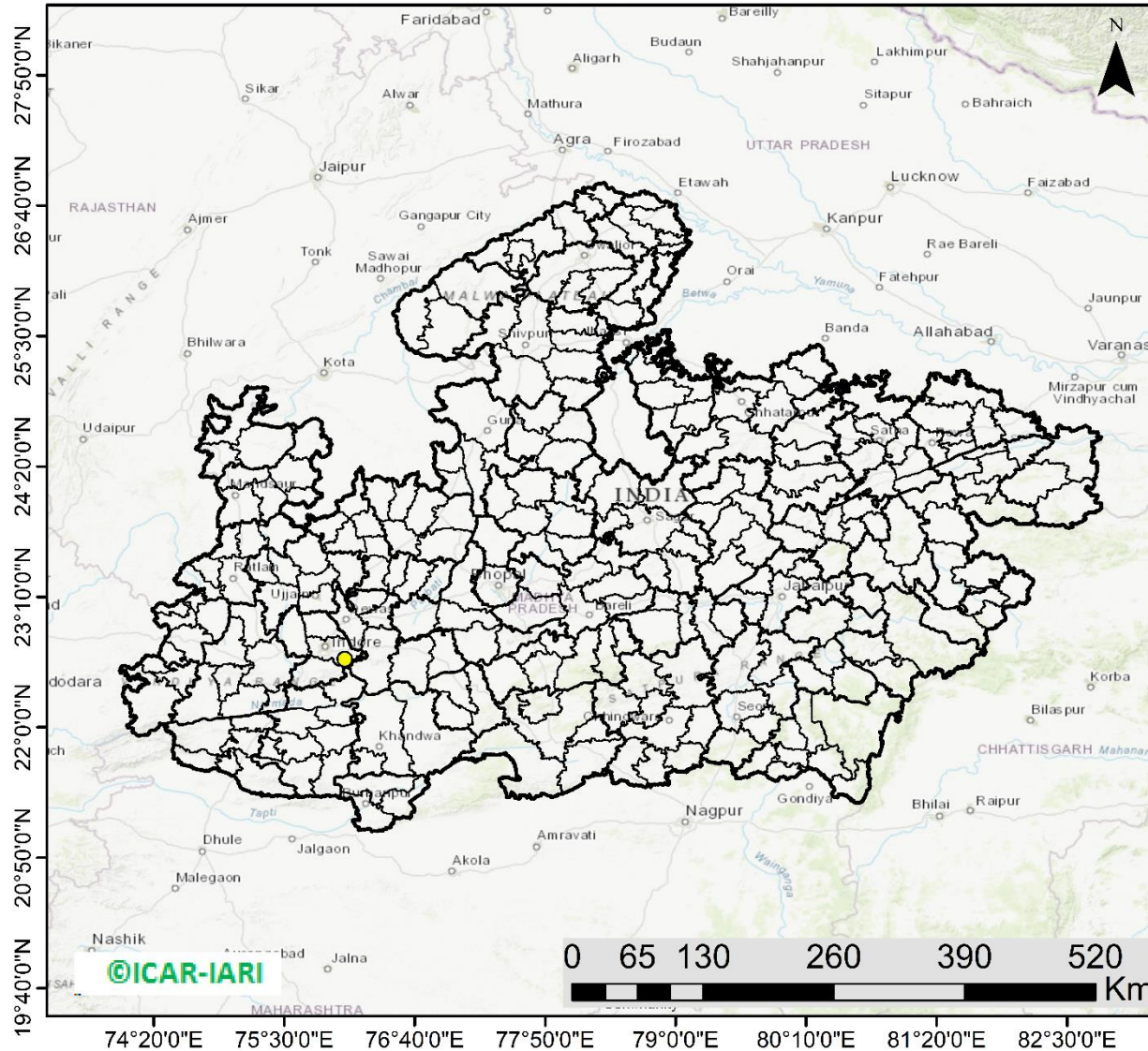
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20

District-wise cumulative number of residues burning events in Uttar Pradesh (15Sep-21Sep-2024)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



01 burning events detected in MP on (21th Sep 2024)

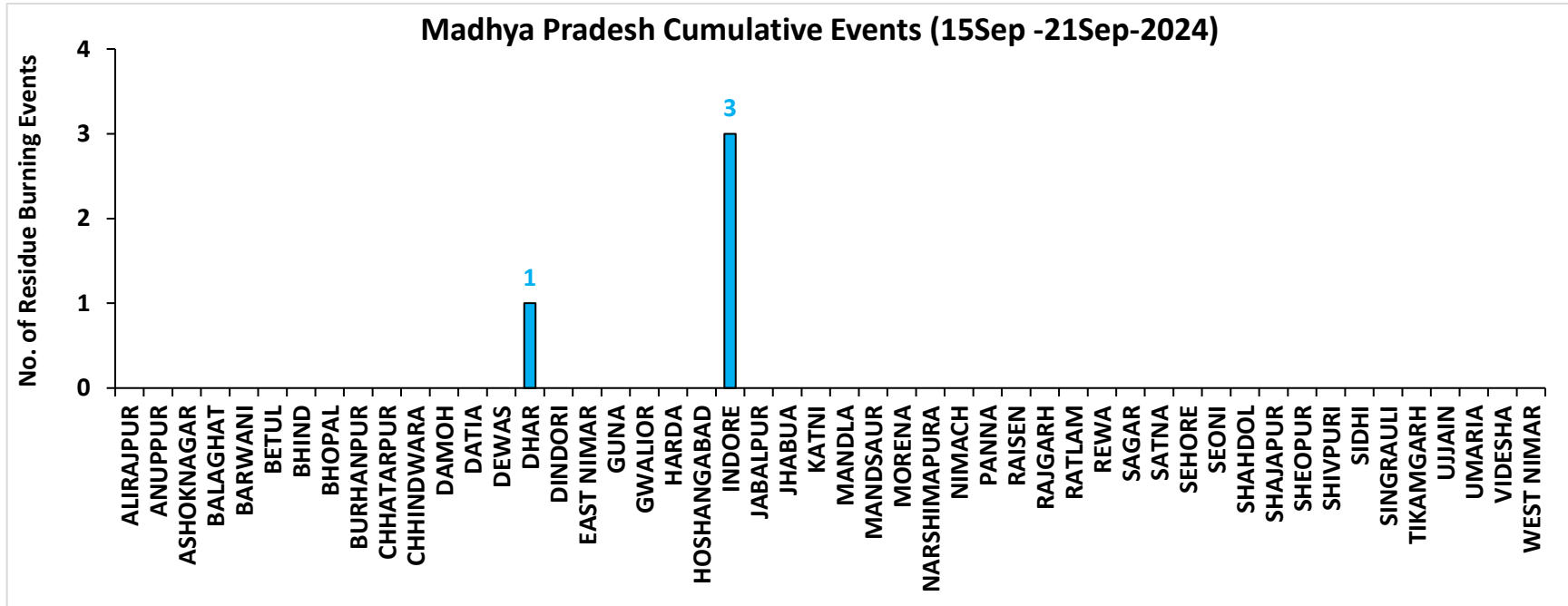
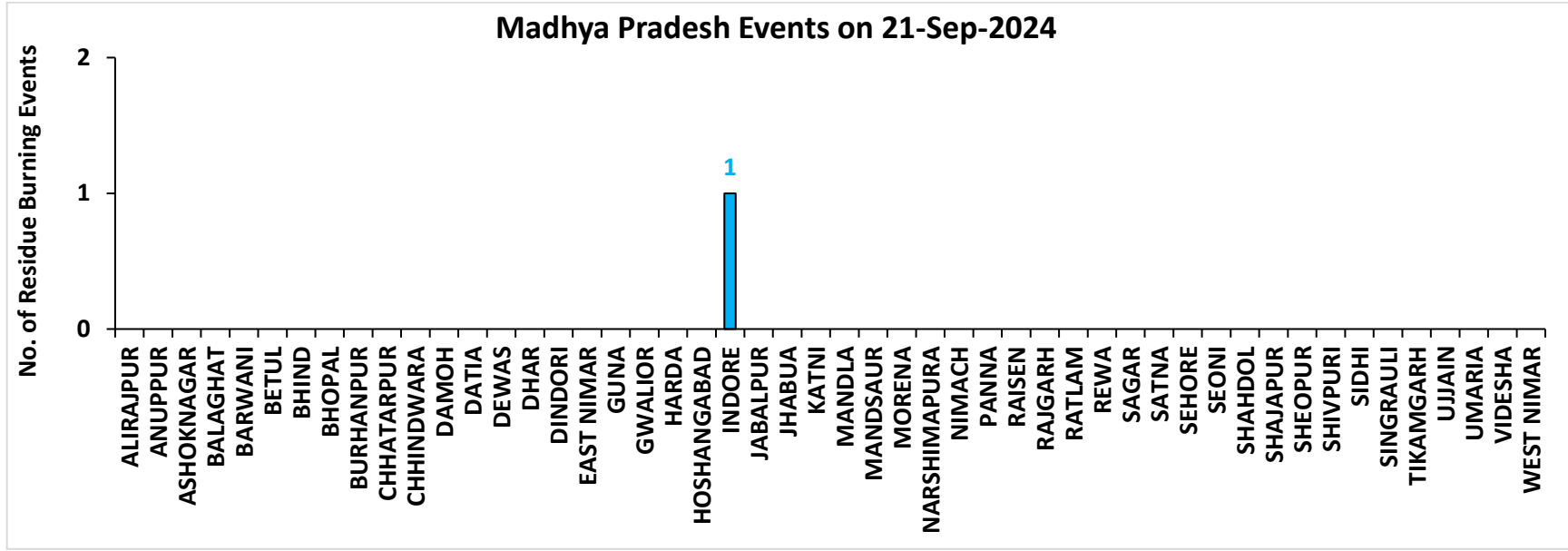
Fire Intensity (W/m²)

- 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-21Sep-2024)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022, 2023 and 2024
(Period: 15 September-21 September)

(a) Punjab

District	15 Sep-21 Sep				
	2020	2021	2022	2023	2024
Amritsar	163	19	90	6	39
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	2
Hoshiarpur	0	0	0	1	0
Jalandhar	0	0	0	0	2
Kapurthala	2	0	0	0	0
Ludhiana	2	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	0
Rupnagar	0	0	0	0	0
Sangrur	0	0	0	0	1
SAS NAGAR (Mohali)	1	0	1	0	0
SBS Nagar	0	0	1	0	1
Tarn Taran	7	1	12	0	5
Total	178	24	106	7	52

(b) Haryana

District	15 Sep-21 Sep				
	2020	2021	2022	2023	2024
AMBALA	2	0	0	0	0
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	7
KURUKSHETRA	2	0	0	0	0
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	0	2
Total	16	0	1	7	16

(c) Uttar Pradesh

District	15 Sep-21 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	0	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	4	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-21 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-21 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-21 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	0
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	4
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-21 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
Total	178	24	106	7	52	16	0	1	7	16	4	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
Total	0	0	0	0	0	2	0	1	0	0	4	0	0	2	4

Details of residue burning events in Punjab on 21-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	JANDIALA GURU	S-NPP	31.59438	75.00515	13:22:23	D	14.60
2	AMRITSAR	JANDIALA GURU	S-NPP	31.59731	75.04362	13:22:23	D	4.80
3	AMRITSAR	JANDIALA GURU	S-NPP	31.69256	75.00527	13:22:23	D	13.30
4	AMRITSAR	MAJITHA	S-NPP	31.70706	75.07148	13:22:23	D	0.90
5	AMRITSAR	MAJITHA	S-NPP	31.72046	75.06845	13:22:23	D	9.00
6	AMRITSAR	MAJITHA	S-NPP	31.72066	74.98583	13:22:23	D	1.60
7	AMRITSAR	MAJITHA	S-NPP	31.76912	75.00529	13:22:23	D	5.50
8	AMRITSAR	MAJITHA	S-NPP	31.78350	75.07153	13:22:23	D	7.90
9	AMRITSAR	TARSIKKA	S-NPP	31.61097	75.08393	13:22:23	D	3.90
10	AMRITSAR	TARSIKKA	S-NPP	31.65985	75.06419	13:22:23	D	6.20
11	AMRITSAR	TARSIKKA	S-NPP	31.66054	75.06837	13:22:23	D	7.80
12	AMRITSAR	VERKA	S-NPP	31.66545	74.97157	13:22:23	D	11.00
13	AMRITSAR	VERKA	S-NPP	31.66611	74.97209	13:22:23	D	7.60
14	FIROZPUR	FIROZPUR	S-NPP	30.97580	74.52696	13:22:23	D	12.50
15	GURDASPUR	BATALA	S-NPP	31.76118	75.18901	13:22:23	D	2.20
16	GURDASPUR	QADIAN	S-NPP	31.78819	75.29050	13:22:23	D	3.20
17	JALANDHAR	JALANDHAR WEST	S-NPP	31.48691	75.59049	13:22:23	D	3.90
18	JALANDHAR	LOHIAN	S-NPP	31.12052	75.17696	13:22:23	D	3.10
19	SANGRUR	DHURI	S-NPP	30.31506	75.84229	13:22:23	D	2.40
20	TARN TARAN	TARN TARAN	S-NPP	31.47072	74.81363	13:22:23	D	3.50
21	TARN TARAN	TARN TARAN	S-NPP	31.49353	74.97056	13:22:23	D	2.90

Details of residue burning events in Haryana on 21-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	FARIDABAD	FARIDABAD	S-NPP	28.34728	77.23041	02:12:23	N	1.90
2	FARIDABAD	FARIDABAD	S-NPP	28.35928	77.24119	02:12:23	N	2.40
3	JIND	JULANA	S-NPP	29.25429	76.36568	02:12:23	N	1.20
4	KAITHAL	GUHLA	S-NPP	30.08216	76.26963	13:22:23	D	4.10
5	KARNAL	CHIRAO	S-NPP	29.63806	76.78708	13:22:23	D	4.20
6	KARNAL	GHARAUNDA	S-NPP	29.56373	76.89587	13:22:23	D	1.90
7	KARNAL	INDRI	S-NPP	29.81957	77.01628	13:22:23	D	2.40
8	KARNAL	KARNAL	S-NPP	29.69955	77.09657	13:22:23	D	4.00
9	KARNAL	KARNAL	S-NPP	29.73489	76.88670	13:22:23	D	2.40
10	KARNAL	KARNAL	S-NPP	29.77607	77.02101	13:22:23	D	7.00
11	KARNAL	NILOKHERI	S-NPP	29.77987	76.97946	13:22:23	D	0.90
12	YAMUNANAGAR	RADAUR	S-NPP	29.98480	77.14655	13:22:23	D	4.20
13	YAMUNANAGAR	RADAUR	S-NPP	29.98814	77.19076	13:22:23	D	3.30

Details of residue burning events in Uttar Pradesh on 21-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	GAUTAMBUDHNAGAR	DADRI	S-NPP	28.64825	77.54840	02:12:23	N	2.30
2	SHAHJAHANPUR	PUWANYA	S-NPP	28.22740	80.15176	13:22:23	D	2.70

Details of residue burning events in Madhya Pradesh on 21-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	INDORE	INDORE	S-NPP	22.60789	76.04183	13:22:23	D	2.20

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

ICAR - HQ	Dr Rajbir Singh	ADG-NRM (AAF&CC)	adgagroandaf@gmail.com
ICAR - IARI	Dr V.K. Sehgal	Principal & Nodal Scientist	iaricreams@gmail.com
	Dr Rajkumar Dhakar	Senior Scientist	raidhakar.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)

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