



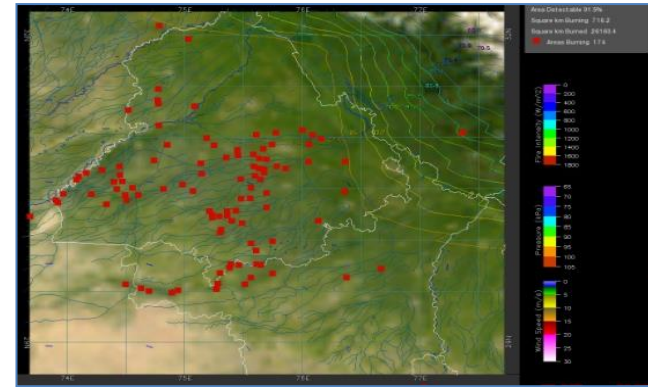
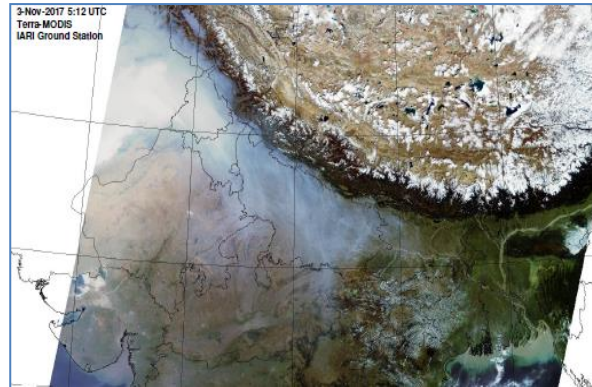
**Bulletin
No. 24**

**Events Date:
08-Oct-2022**

**Issued on:
08-Oct-2022**



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



Prepared by:

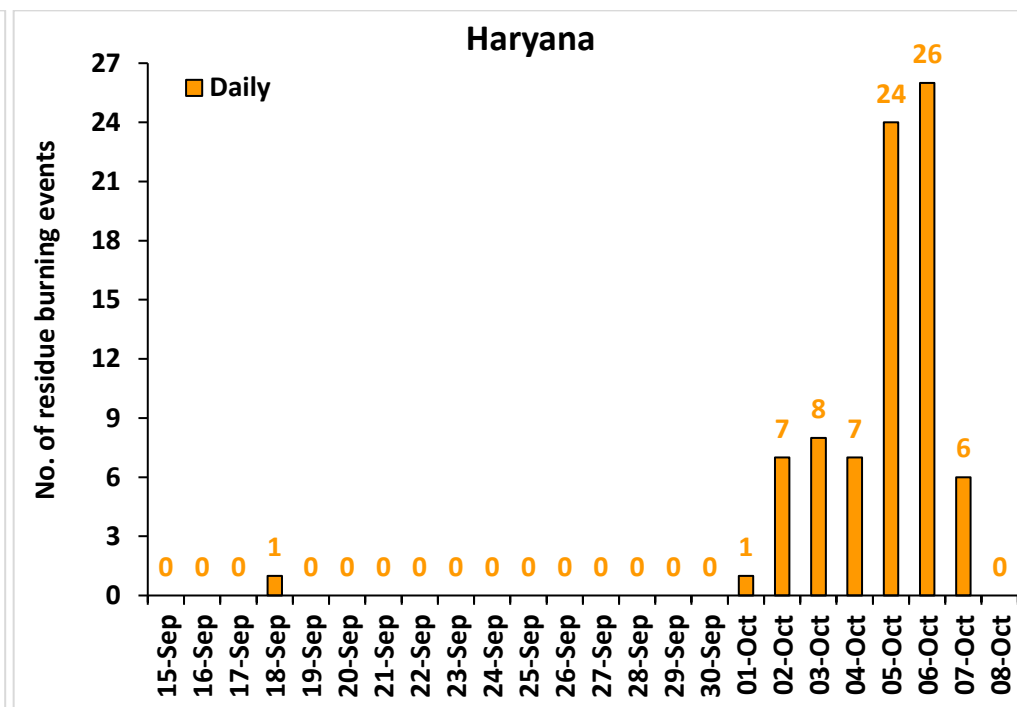
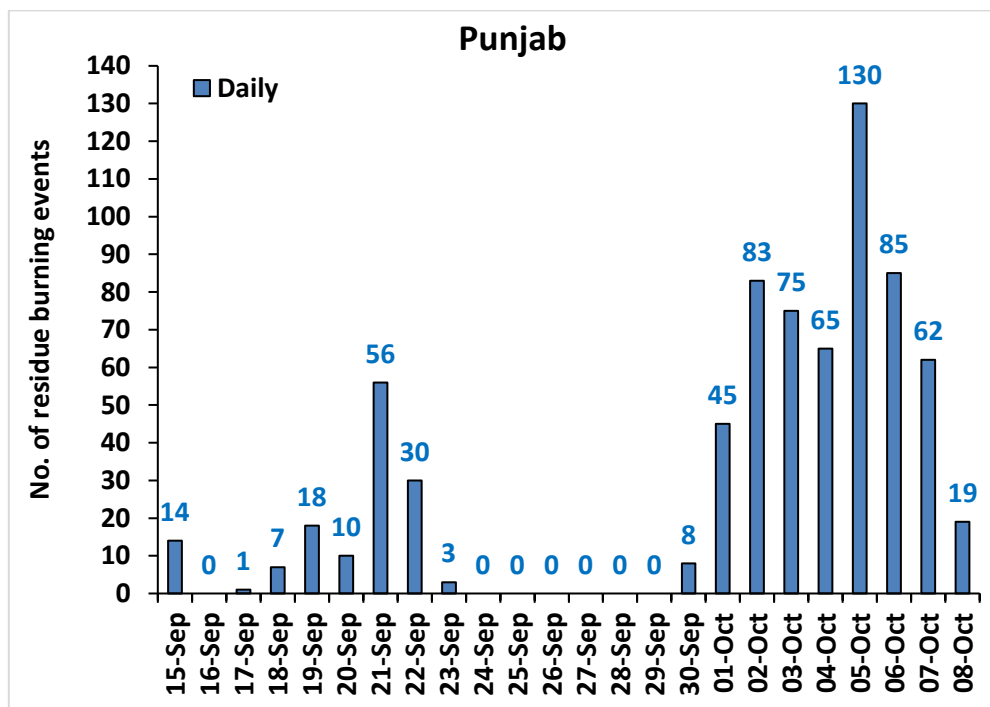
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

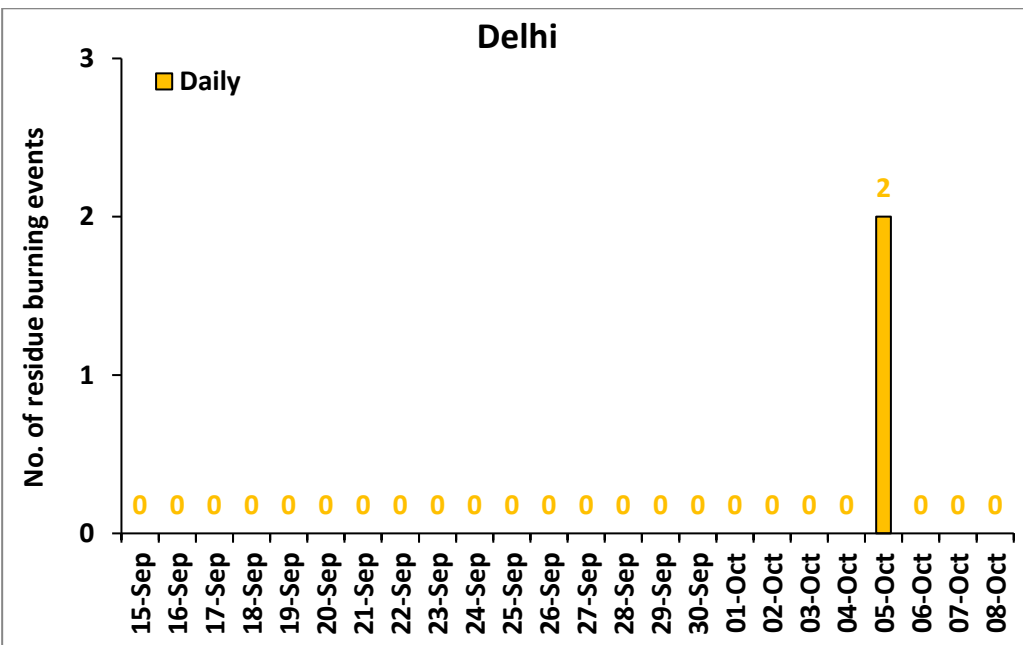
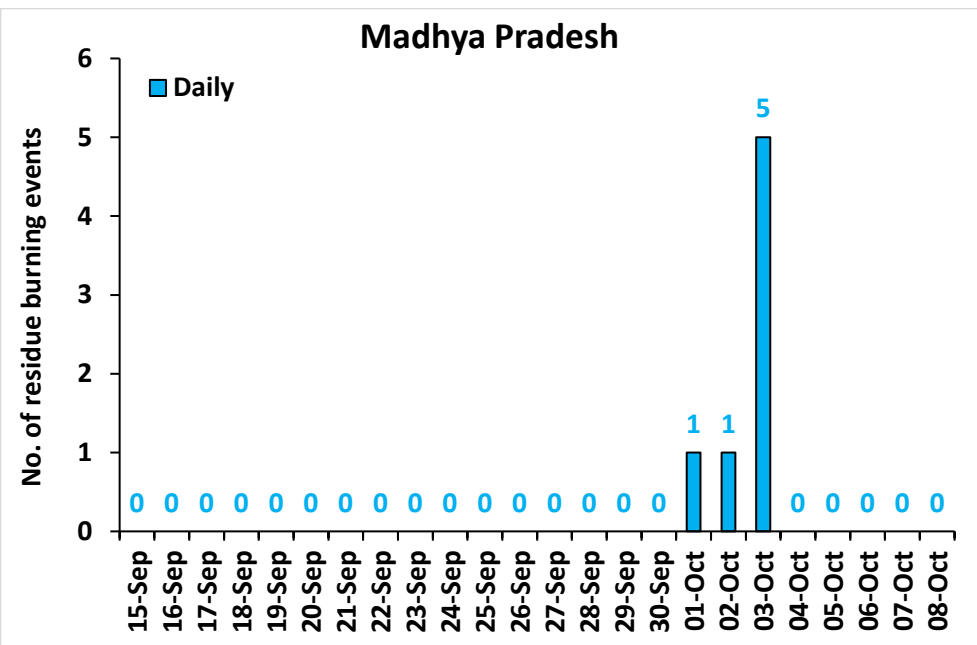
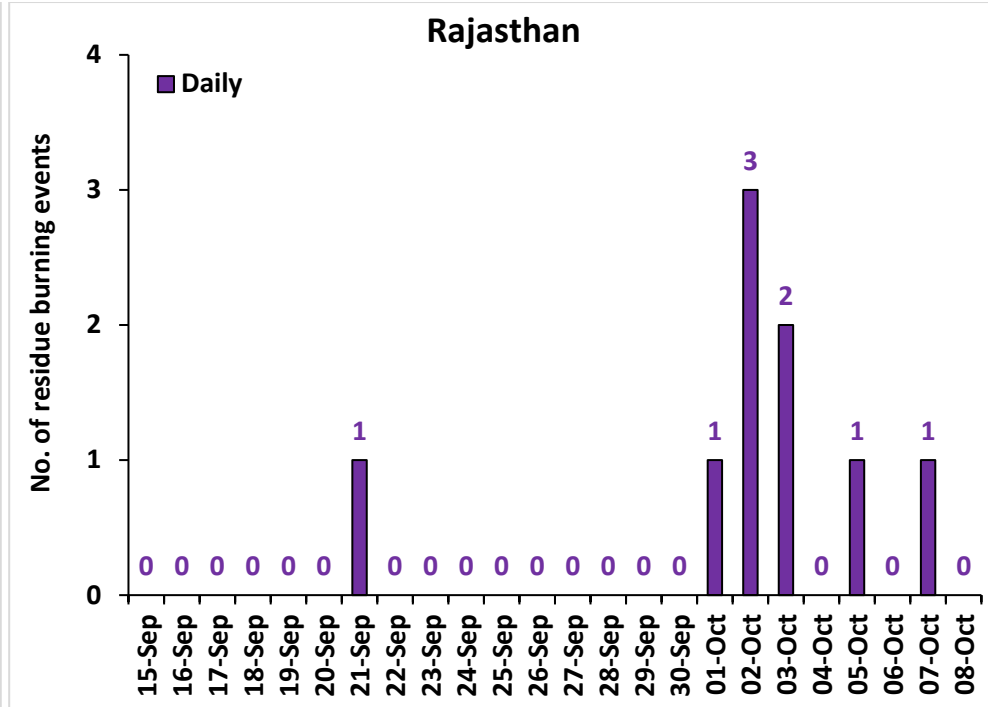
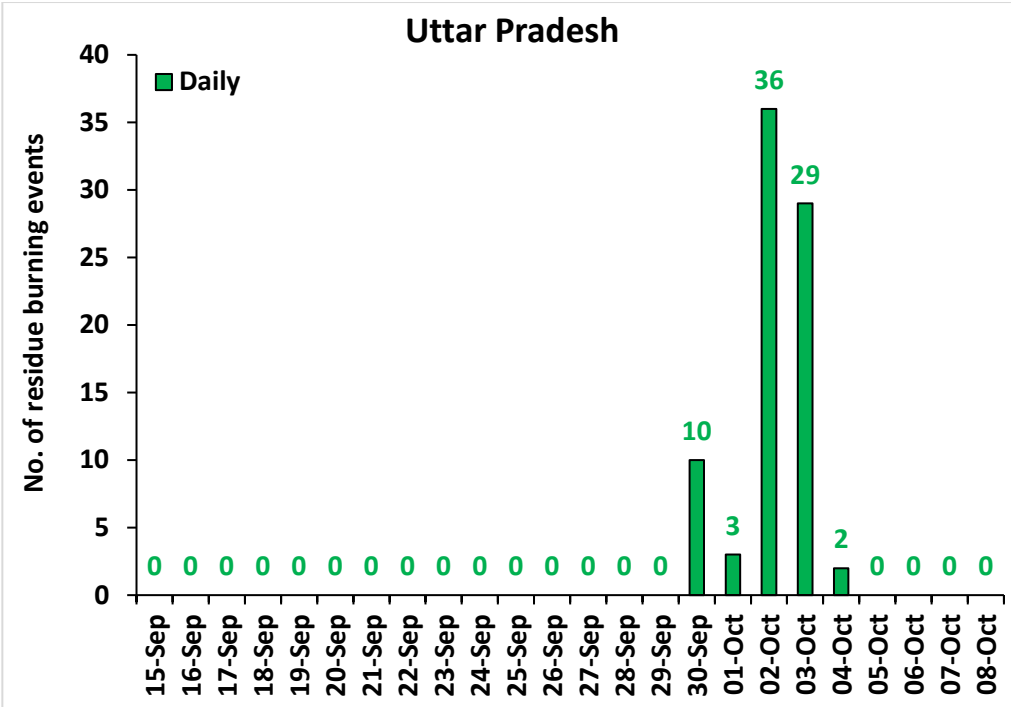
<http://creams.iari.res.in>

Highlights for 08-Oct-2022

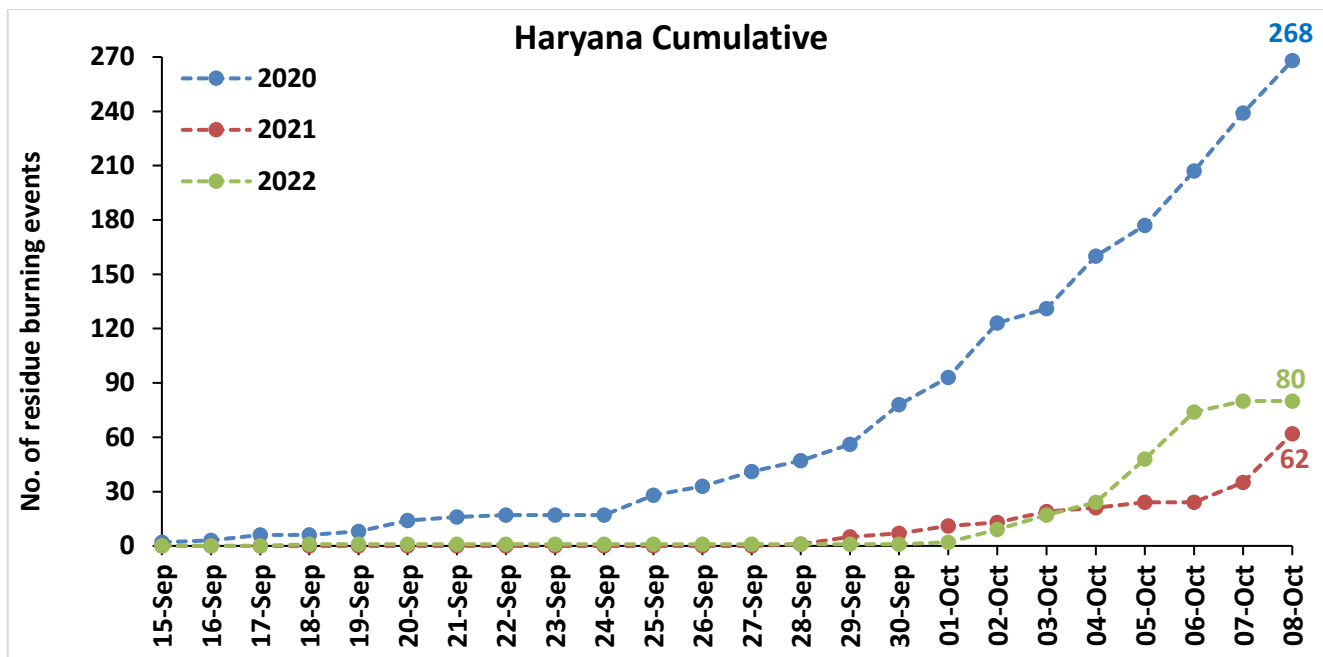
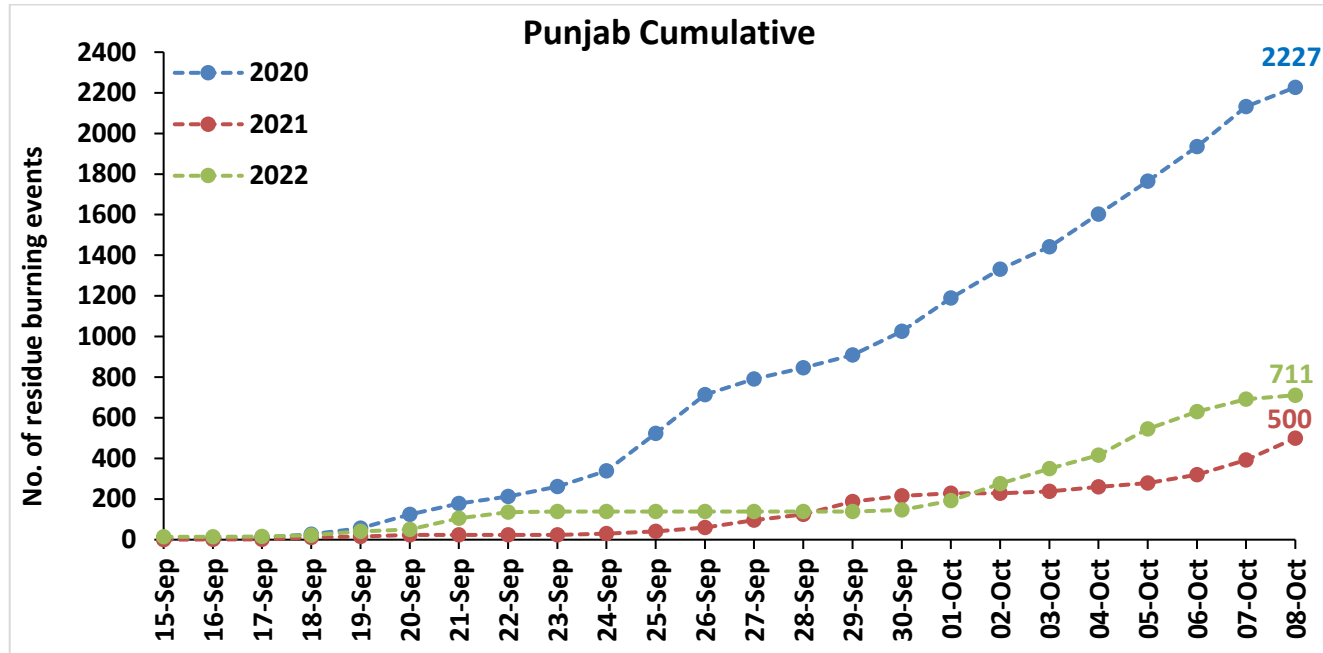
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **19** residue burning events in the six study States on 08-Oct-2022.
- The state wise events detected on 08-Oct-2022 were **19** in Punjab, **0** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Total **889** burning events were detected in the six states between 15-Sept-2022 and 08-Oct-2022, which are distributed as **711, 80, 80, 2, 9** and **7** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.
- Detection of residue burning events was hampered by the presence of clouds over Haryana, Delhi, Uttar Pradesh, Rajasthan and Madhya Pradesh.

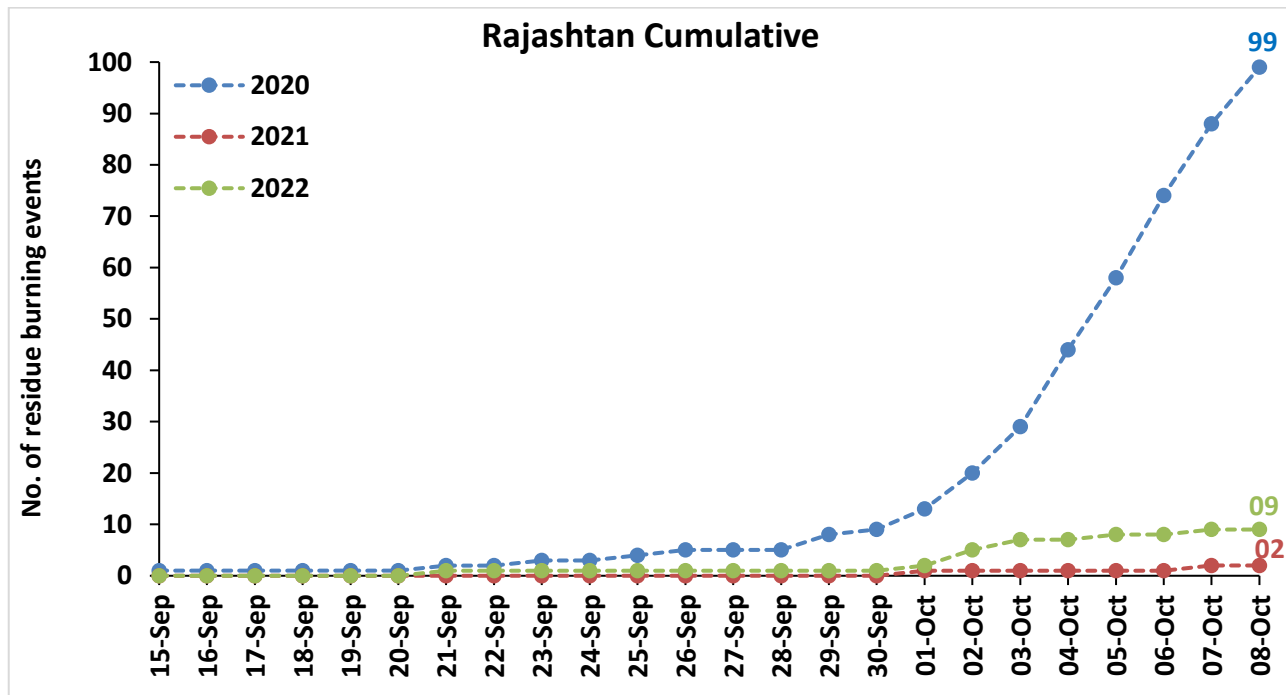
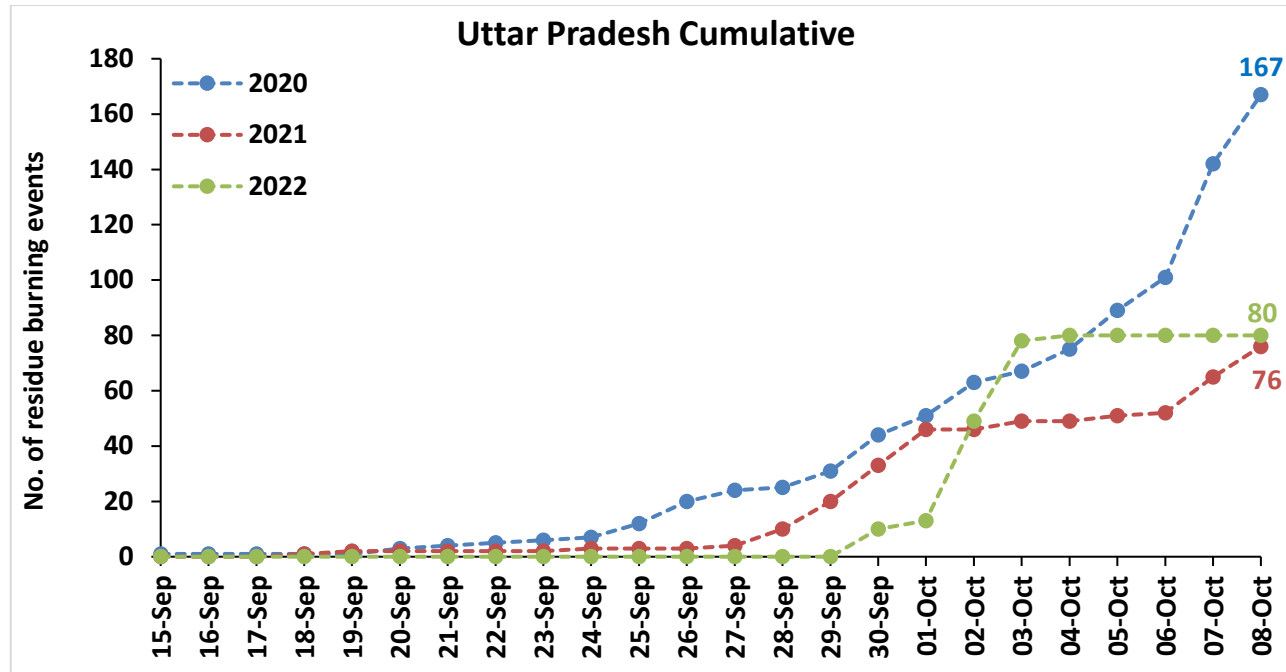
Temporal distribution of rice residue burning events for the study States in 2022

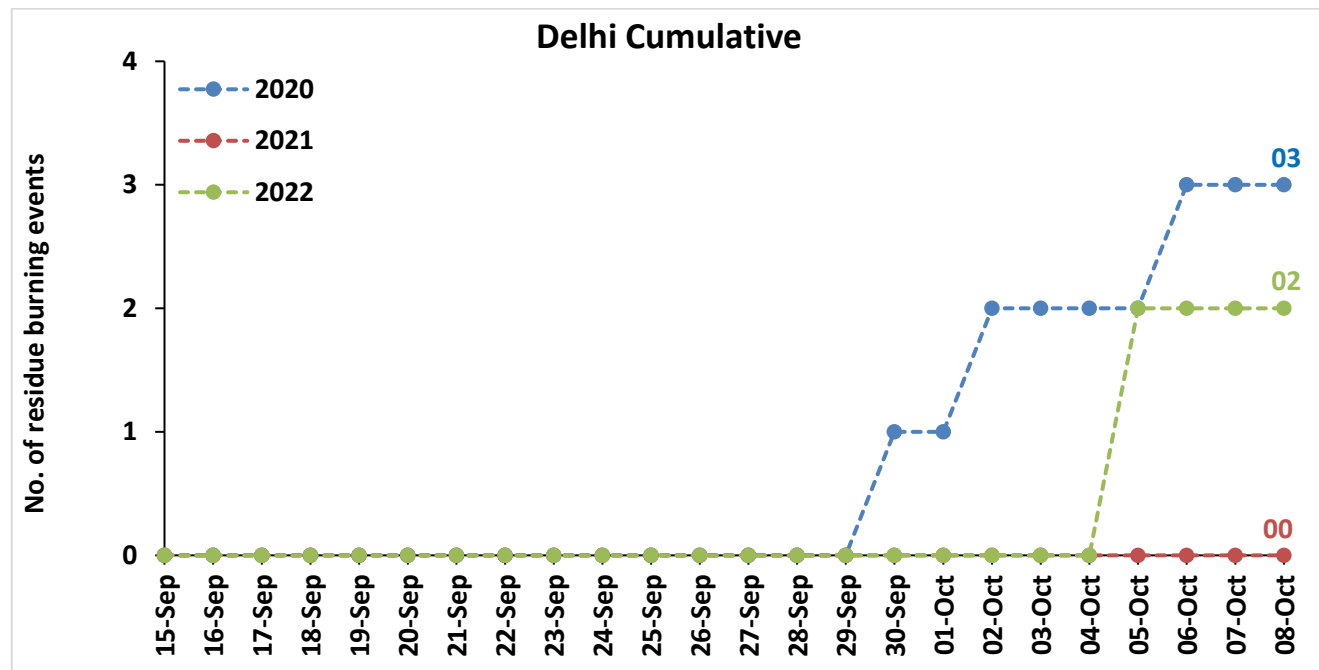
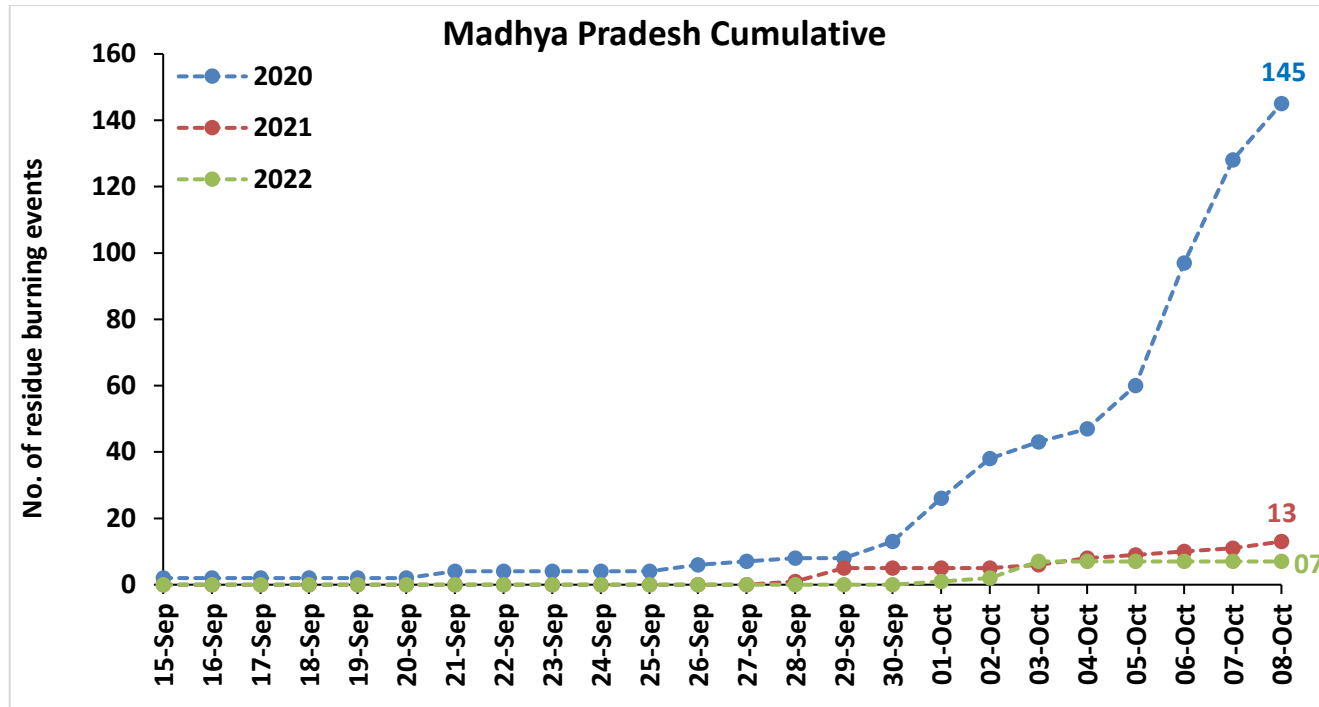




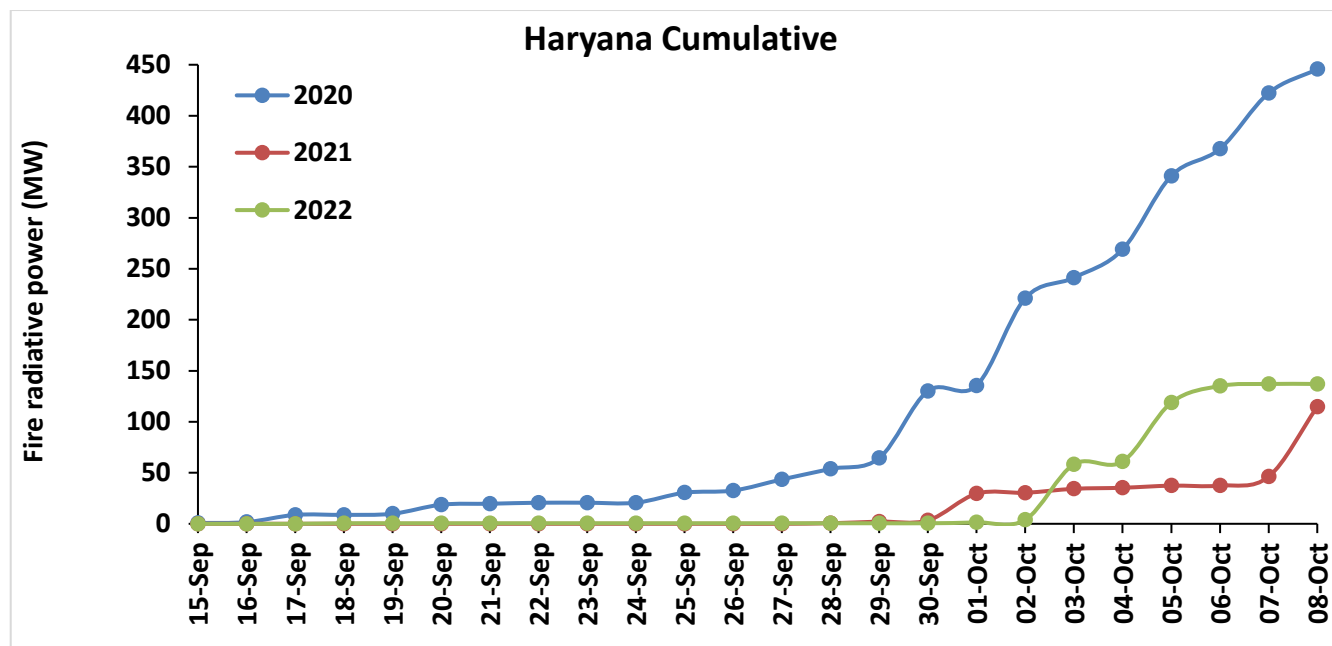
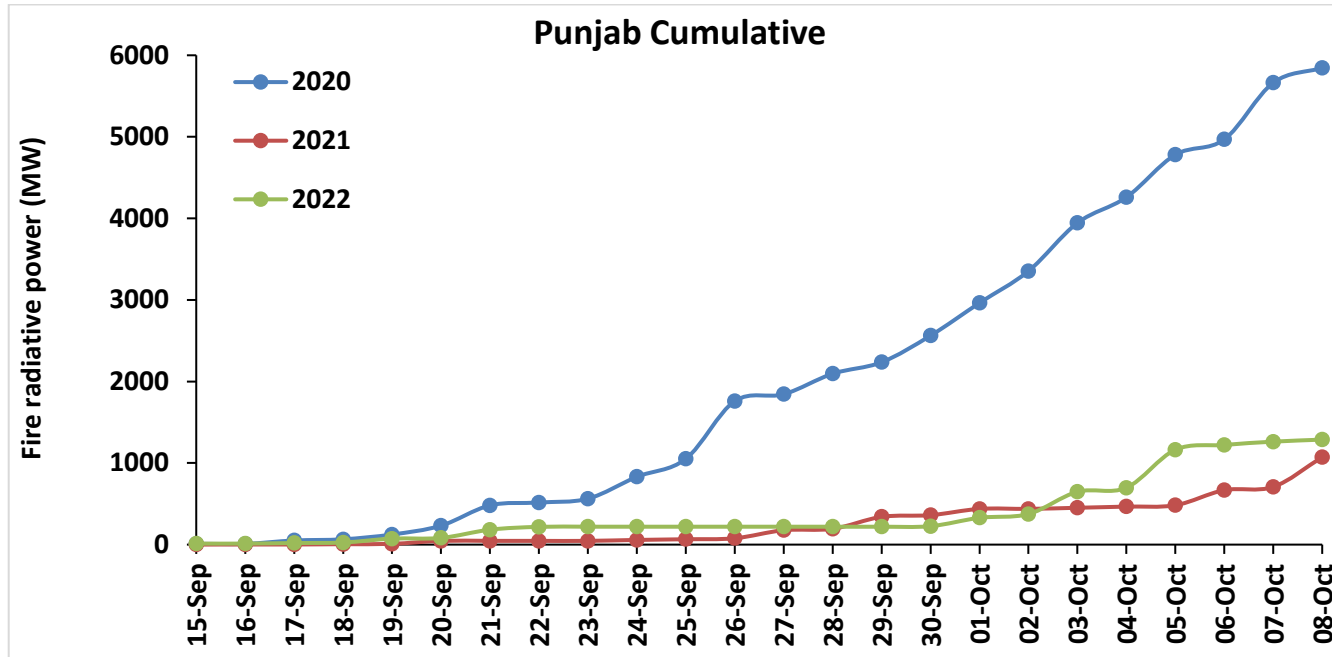
Comparison of residue burning events in current year (2022) with previous years (2020 and 2021) for the study States

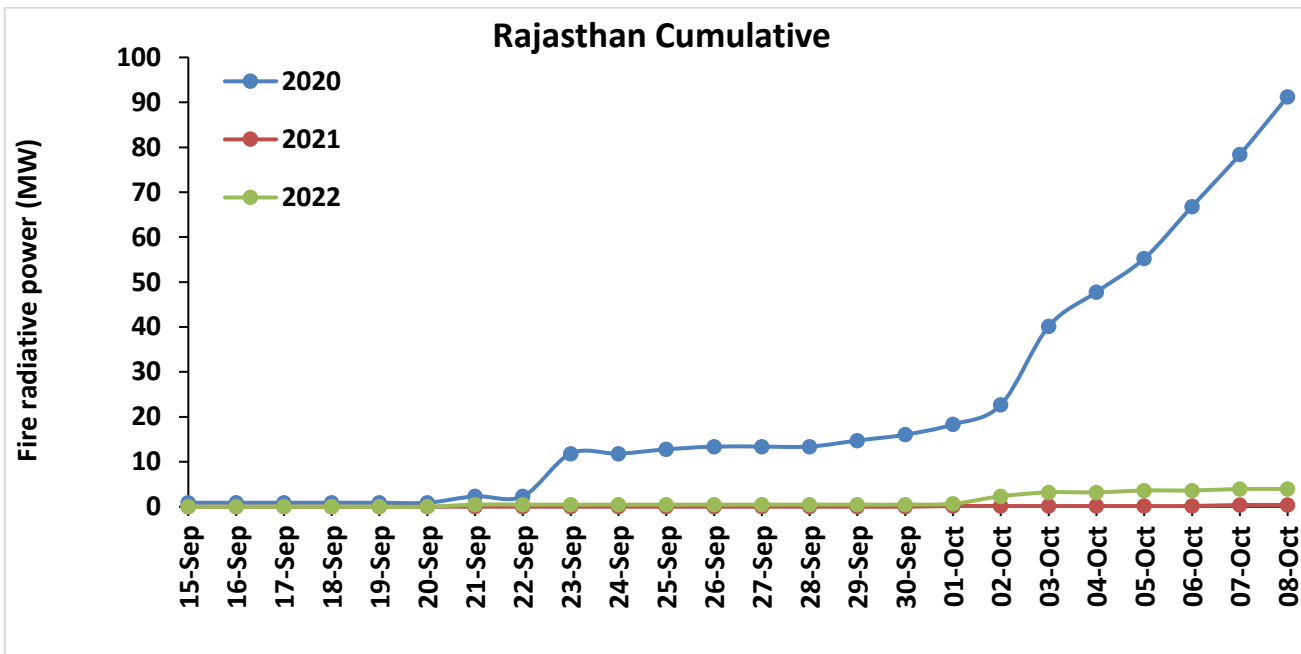
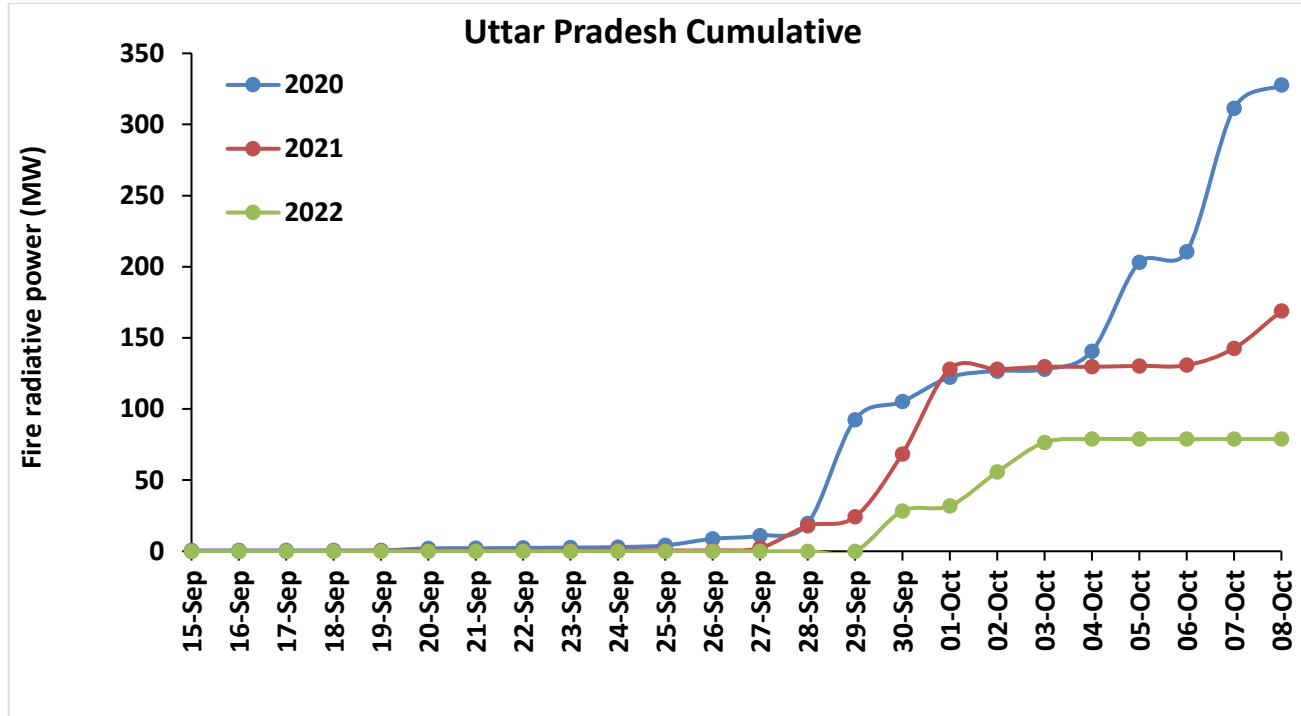


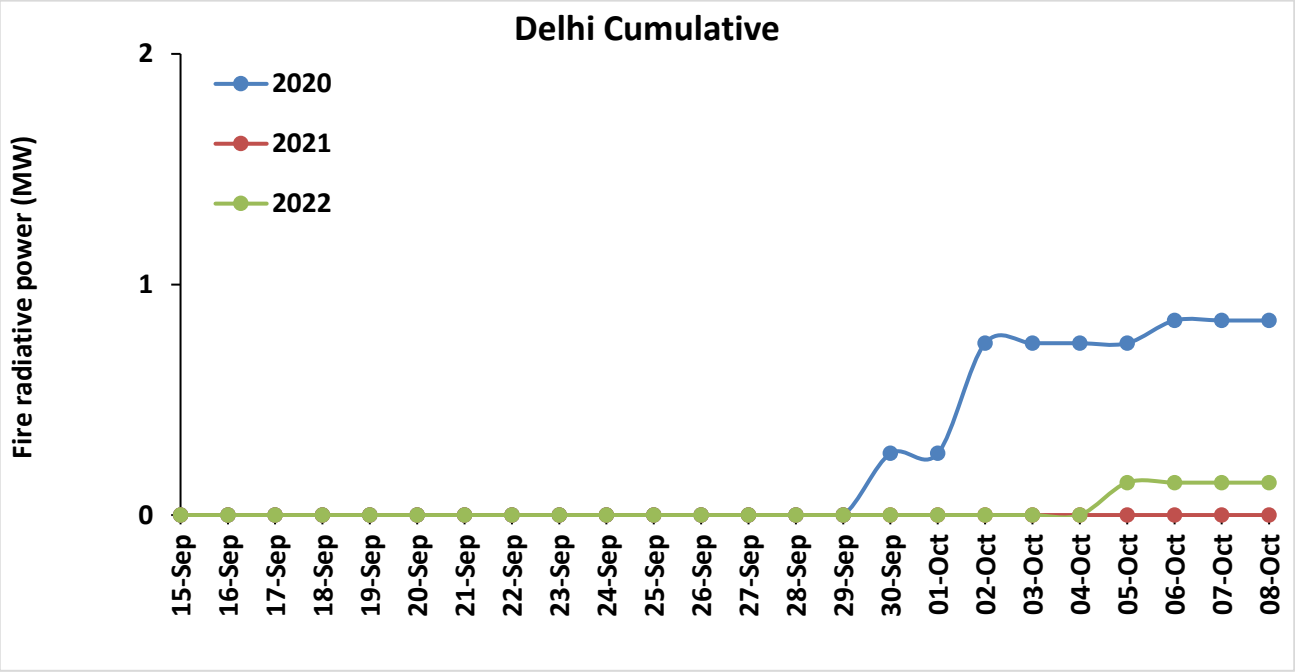
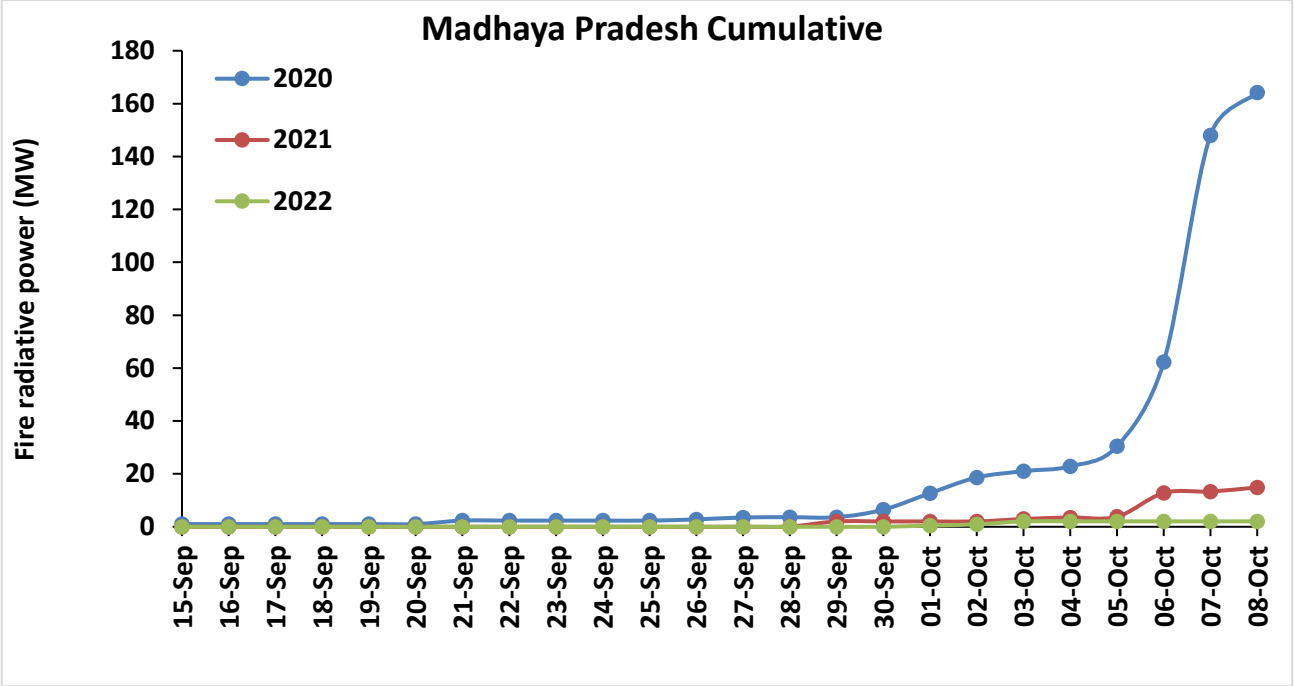




Comparison of residue burning fire power in current year (2022) with previous years (2021 and 2020) for the study States

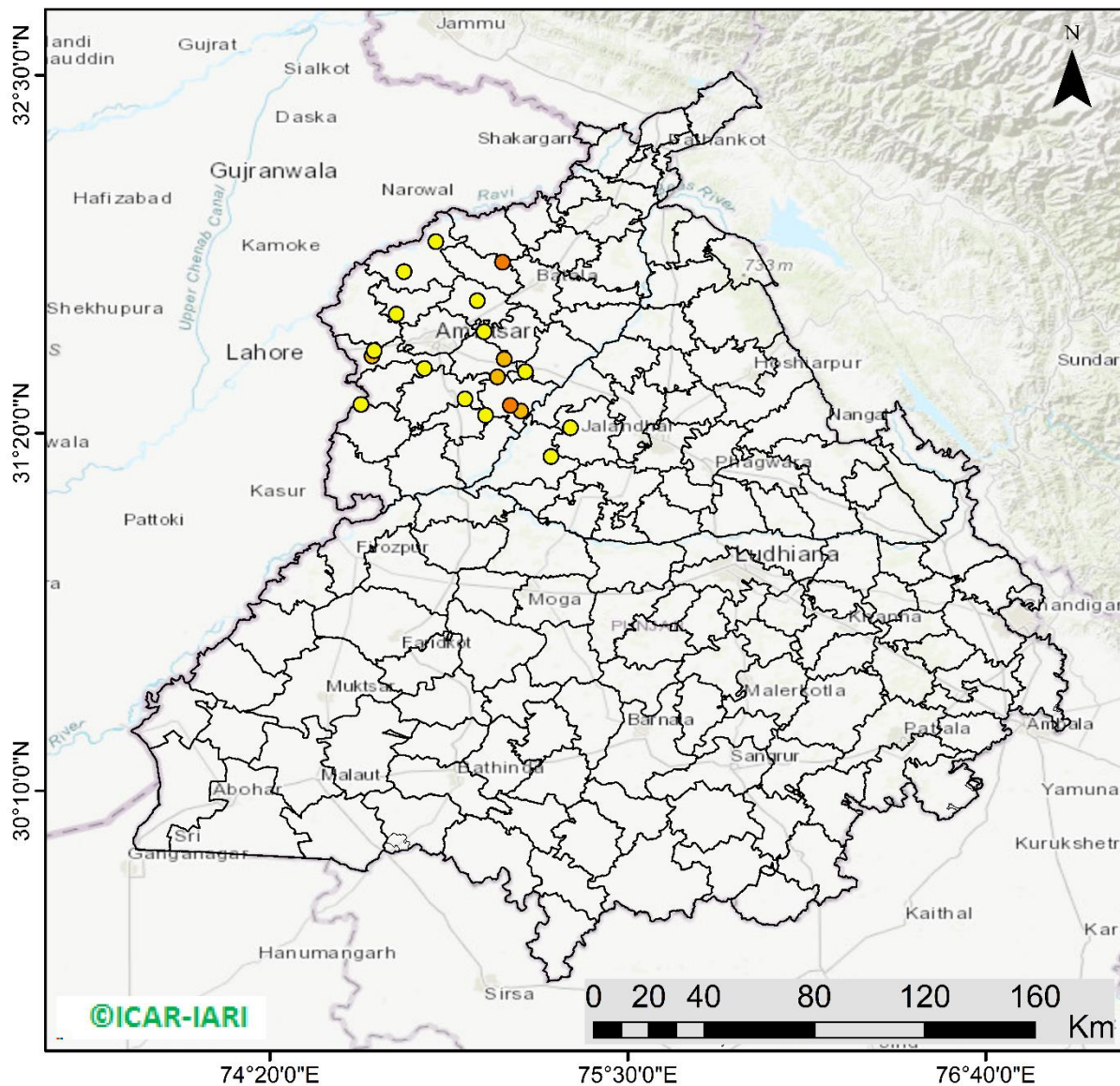






Punjab

RICE RESIDUE BURNING IN PUNJAB



19 burning events detected in Punjab during (08th Oct 2022)

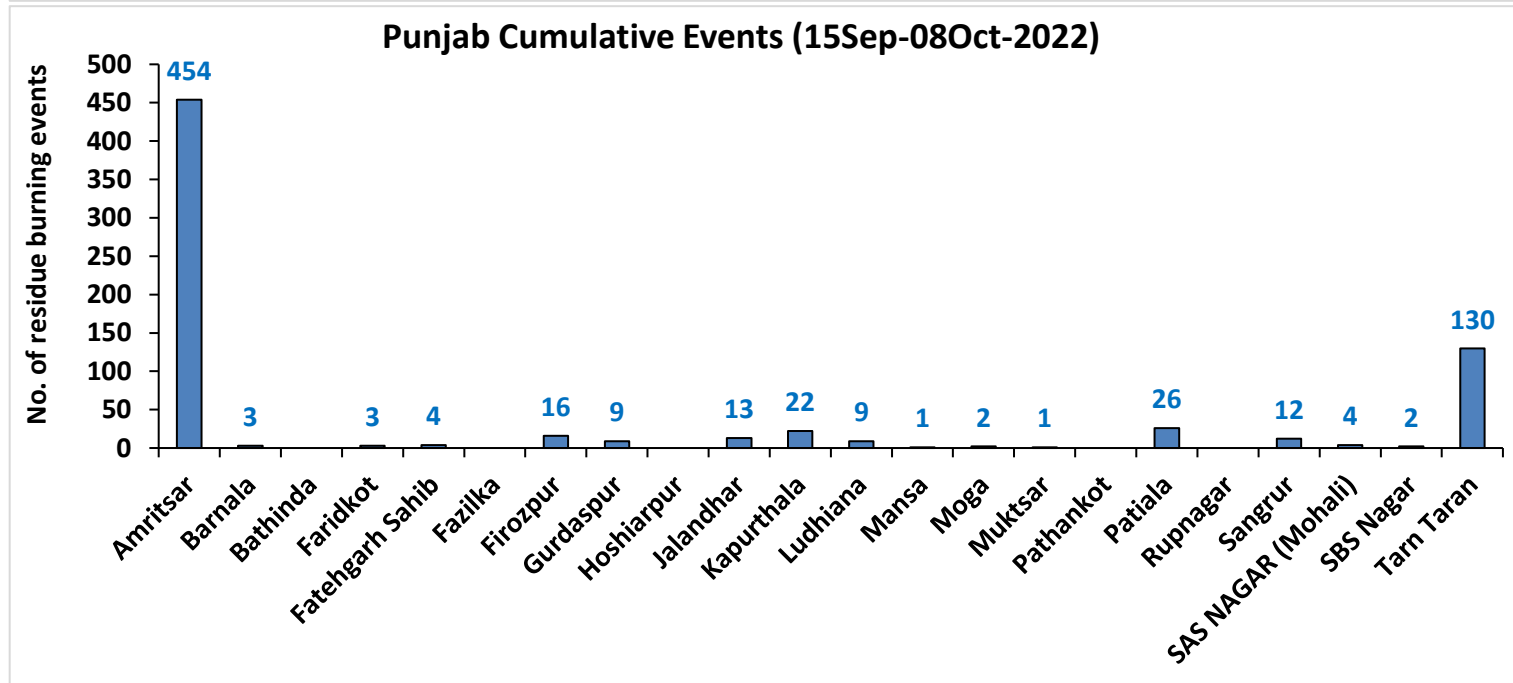
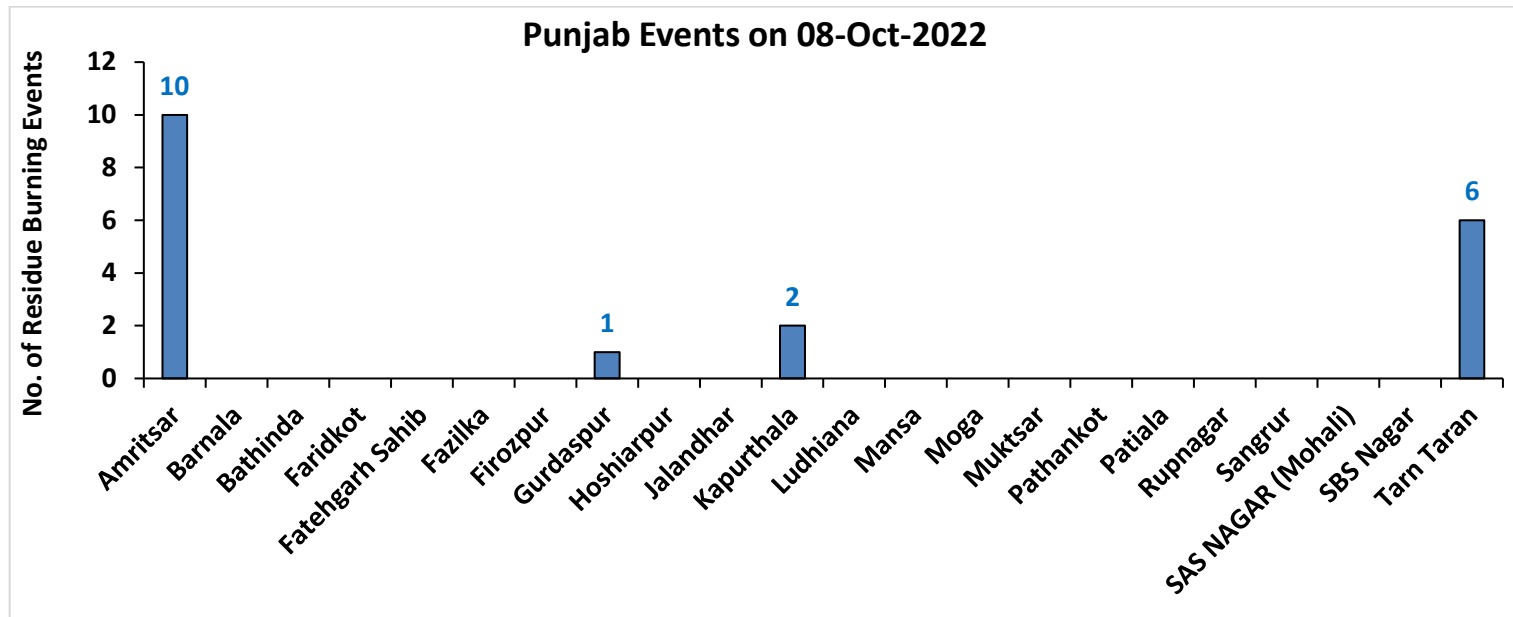
Fire Intensity (W/m²)

- 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- 08Oct-2022)



District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022
(Period: 15 September-08 October)

(a) Punjab

District	15 Sep-08 Oct 2022		
	2020	2021	2022
Amritsar	1243	248	454
Barnala	5	0	3
Bathinda	0	0	0
Faridkot	14	14	3
Fatehgarh Sahib	28	8	4
Fazilka	1	1	0
Firozpur	59	13	16
Gurdaspur	101	8	9
Hoshiarpur	4	0	0
Jalandhar	21	10	13
Kapurthala	35	15	22
Ludhiana	59	33	9
Mansa	4	1	1
Moga	14	2	2
Muktsar	1	1	1
Pathankot	0	0	0
Patiala	118	28	26
Rupnagar	6	2	0
Sangrur	48	5	12
SAS NAGAR (Mohali)	11	8	4
SBS Nagar	5	1	2
Tarn Taran	450	102	130
Total	2227	500	711

(b) Haryana

District	15 Sep-08 Oct 2022		
	2020	2021	2022
AMBALA	37	3	9
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	19	1	3
GURGAON	0	0	0
HISAR	3	0	0
JHAJJAR	1	0	0
JIND	3	2	8
KAITHAL	39	10	9
KARNAL	67	21	20
KURUKSHETRA	62	20	27
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	5	1	0
PANCHKULA	0	0	0
PANIPAT	6	1	1
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	2	0	0
SONIPAT	6	1	2
YAMUNANAGAR	18	2	1
Total	268	62	80

(c) Uttar Pradesh

District	15 Sep-08 Oct 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	1	0	0	MUZAFARNAGAR	2	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	3	2	2
ALIGARH	15	0	1	GHAZIABAD	1	1	1	PRATAPGARH	0	0	0
ALLAHABAD	0	0	0	GONDA	0	0	0	RAIBEARELI	1	0	0
AMBEDKARNAGAR	0	0	0	GORAKHPUR	0	0	0	RAMPUR	5	7	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	6	0	4
AMROHA	1	0	0	HAPUR	2	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	12	0	4	HARDOI	0	0	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	10	55	53
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	17	2	2
BAGHPAT	1	0	0	JAUNPUR	0	0	0	SHARANPUR	11	0	0
BAHRAICH	2	0	0	JHANSI	5	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	2	0	0	SIDDHARTHANAGAR	0	0	0
BALRAMPUR	0	0	0	KANPUR	0	1	0	SITAPUR	4	1	0
BANDA	0	0	0	KANPUR DEHAT	1	0	0	SONBHADRA	0	0	0
BARABANKI	6	0	0	KASGANJ	1	0	0	SULTANPUR	0	0	0
BAREILLY	5	1	0	KAUSHAMBI	6	0	0	UNNAO	2	0	0
BASTI	0	0	0	KHERI	13	3	8	VARANASI	0	0	0
BIJNOR	3	0	1	KUSHINAGAR	0	0	0	Total	167	76	80
BULANSAHAR	1	0	2	LALITPUR	0	1	2				
CHANDAULI	0	0	0	LUCKNOW	1	0	0				
CHITRAKOOT	0	0	0	MAHARAJGANJ	0	0	0				
DEORIA	0	0	0	MAHOBA	0	0	0				
ETAH	4	0	0	MAINPURI	0	1	0				
ETAWAH	0	0	0	MATHURA	3	1	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	8	0	0				
FATEHPUR	5	0	0	MIRZAPUR	5	0	0				
FIROZABAD	1	0	0	MORADABAD	1	0	0				

(d) Delhi

District	15 Sep-08 Oct 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	2	0	2
NORTH EAST	0	0	0
NORTH WEST DELHI	0	0	0
SHAHADRA	0	0	0
SOUTH	1	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
Total	3	0	2

(e) Rajasthan

District	15 Sep-08 Oct 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	1	0	0
BANSWARA	0	0	0
BARAN	48	0	3
BARMER	2	0	0
BHARATPUR	0	0	0
BHILWARA	2	0	0
BIKANER	0	0	0
BUNDI	1	0	3
CHITTAURGARH	0	1	0
CHURU	0	0	0
DAUSA	0	0	0
DHOLPUR	0	0	0
DUNGARPUR	0	0	0
GANGANAGAR	2	0	0
HANUMANGARH	23	1	2
JAIPUR	0	0	0
JAISELMER	2	0	0
JALOR	0	0	0
JHALAWAR	0	0	0
JHUNJHUNUN	1	0	0
JODHPUR	1	0	0
KARAULI	1	0	0
KOTA	13	0	1
NAGAUR	0	0	0
PALI	1	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	0	0	0
SWAIMADHOPUR	0	0	0
TONK	1	0	0
UDAIPUR	0	0	0
Total	99	2	9

(f) Madhya Pradesh

District	15 Sep-08 Oct 2022						
	2020	2021	2022				
				PANNA	1	0	0
ALIRAJPUR	0	0	0	RAISEN	2	0	0
ANUPPUR	0	0	0	RAJGARH	1	0	2
ASHOKNAGAR	7	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	1	0	0
BARWANI	0	0	0	SAGAR	8	2	1
BETUL	0	0	0	SATNA	3	0	0
BHIND	0	0	0	SEHORE	4	0	1
BHOPAL	2	0	0	SEONI	2	0	0
BURHANPUR	0	0	0	SHAHDOL	0	0	0
CHHATARPUR	2	0	0	SHAJAPUR	4	0	0
CHHINDWARA	0	0	0	SHEOPUR	2	0	0
DAMOH	6	0	0	SHIVPURI	1	0	0
DATIA	5	0	0	SIDHI	0	0	0
DEWAS	3	0	0	SINGRAULI	0	0	0
DHAR	13	0	0	TIKAMGARH	1	0	0
DINDORI	0	0	0	UJJAIN	5	0	0
EAST NIMAR	0	1	0	UMARIA	0	0	0
GUNA	7	1	1	VIDESHA	26	2	1
GWALIOR	14	0	1	WEST NIMAR	1	0	0
HARDA	8	7	0	Total	145	13	7
HOSHANGABAD	3	0	0				
INDORE	2	0	0				
JABALPUR	5	0	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	5	0	0				
NARSHIMAPURA	1	0	0				
NIMACH	0	0	0				

State-wise and date-wise number of paddy residue burning events detected in 2020, 2021 and 2022
(Period: 15 September - 08 October 2022)

Number of Paddy Residue Burning Events Detected

	Punjab			Haryana			Uttar Pradesh			Delhi			Rajasthan			Madhya Pradesh		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
15-Sep	5	0	14	2	0	0	1	0	0	0	0	0	1	0	0	2	0	0
16-Sep	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	5	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Sep	17	9	7	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
19-Sep	30	5	18	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
20-Sep	67	8	10	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0
21-Sep	54	0	56	2	0	0	1	0	0	0	0	0	1	0	1	2	0	0
22-Sep	34	0	30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
23-Sep	49	0	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
24-Sep	78	5	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
25-Sep	184	11	0	11	0	0	5	0	0	0	0	0	1	0	0	0	0	0
26-Sep	190	19	0	5	0	0	8	0	0	0	0	0	1	0	0	2	0	0
27-Sep	78	37	0	8	0	0	4	1	0	0	0	0	0	0	0	1	0	0
28-Sep	55	28	0	6	1	0	1	6	0	0	0	0	0	0	0	1	1	0
29-Sep	63	64	0	9	4	0	6	10	0	0	0	0	3	0	0	0	4	0
30-Sep	116	27	8	22	2	0	13	13	10	1	0	0	1	0	0	5	0	0
01-Oct	165	13	45	15	4	1	7	13	3	0	0	0	4	1	1	13	0	1
02-Oct	141	0	83	30	2	7	12	0	36	1	0	0	7	0	3	12	0	1
03-Oct	110	9	75	8	6	8	4	3	29	0	0	0	9	0	2	5	1	5
04-Oct	162	23	65	29	2	7	8	0	2	0	0	0	15	0	0	4	2	0
05-Oct	161	18	130	17	3	24	14	2	0	0	0	2	14	0	1	13	1	0
06-Oct	171	42	85	30	0	26	12	1	0	1	0	0	16	0	0	37	1	0
07-Oct	197	72	62	32	11	6	41	13	0	0	0	0	14	1	1	31	1	0
08-Oct	95	108	19	29	27	0	25	11	0	0	0	0	11	0	0	17	2	0
Total	2227	500	711	268	62	80	167	76	80	3	0	2	99	2	9	145	13	7

Details of residue burning events in Punjab on 08-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	31.85930	74.77030	13:10:46	D	3.60
2	AMRITSAR	AJNALA	S-NPP	31.95700	74.87400	13:10:46	D	4.10
3	AMRITSAR	ATTARI	S-NPP	31.54340	74.83690	13:10:46	D	4.50
4	AMRITSAR	ATTARI	S-NPP	31.58370	74.66630	13:10:46	D	7.90
5	AMRITSAR	ATTARI	S-NPP	31.60120	74.67340	13:10:46	D	4.60
6	AMRITSAR	HARSHA CHHINA	S-NPP	31.72070	74.74550	13:10:46	D	3.70
7	AMRITSAR	JANDIALA GURU	S-NPP	31.57400	75.09670	13:10:46	D	7.20
8	AMRITSAR	JANDIALA GURU	S-NPP	31.66330	75.03150	13:10:46	D	3.30
9	AMRITSAR	MAJITHA	S-NPP	31.76420	75.00900	13:10:46	D	0.90
10	AMRITSAR	RAYYA	S-NPP	31.53300	75.16600	13:10:46	D	4.40
11	GURDASPUR	FATEHGARH CHURIAN	S-NPP	31.89000	75.09140	13:10:46	D	11.70
12	KAPURTHALA	KAPURTHALA	S-NPP	31.34980	75.31270	13:10:46	D	3.80
13	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.25590	75.24980	13:10:46	D	4.10
14	TARN TARAN	BHIKHIWIND	S-NPP	31.42600	74.62990	13:10:46	D	3.10
15	TARN TARAN	KHADUR SAHIB	S-NPP	31.39070	75.03650	13:10:46	D	3.80
16	TARN TARAN	KHADUR SAHIB	S-NPP	31.40480	75.15130	13:10:46	D	7.70
17	TARN TARAN	KHADUR SAHIB	S-NPP	31.51570	75.07510	13:10:46	D	5.80
18	TARN TARAN	KHADUR SAHIB	AQUA	31.42300	75.11700	14:06:26	D	12.50
19	TARN TARAN	TARN TARAN	S-NPP	31.44390	74.96900	13:10:46	D	4.00

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)

and on IARI CREAMS website (<http://creams.iari.res.in/cms2/index.php>)
