



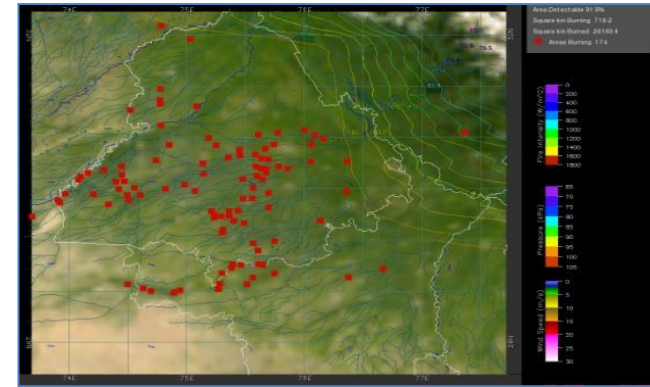
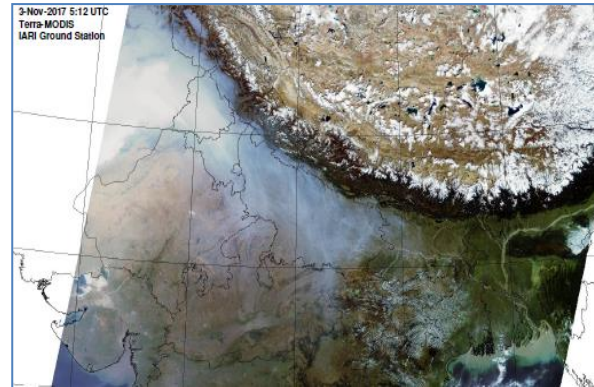
Bulletin No. 07

Events Date:
21-Sep-2022

Issued on:
21-Sep-2022



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



Prepared by:

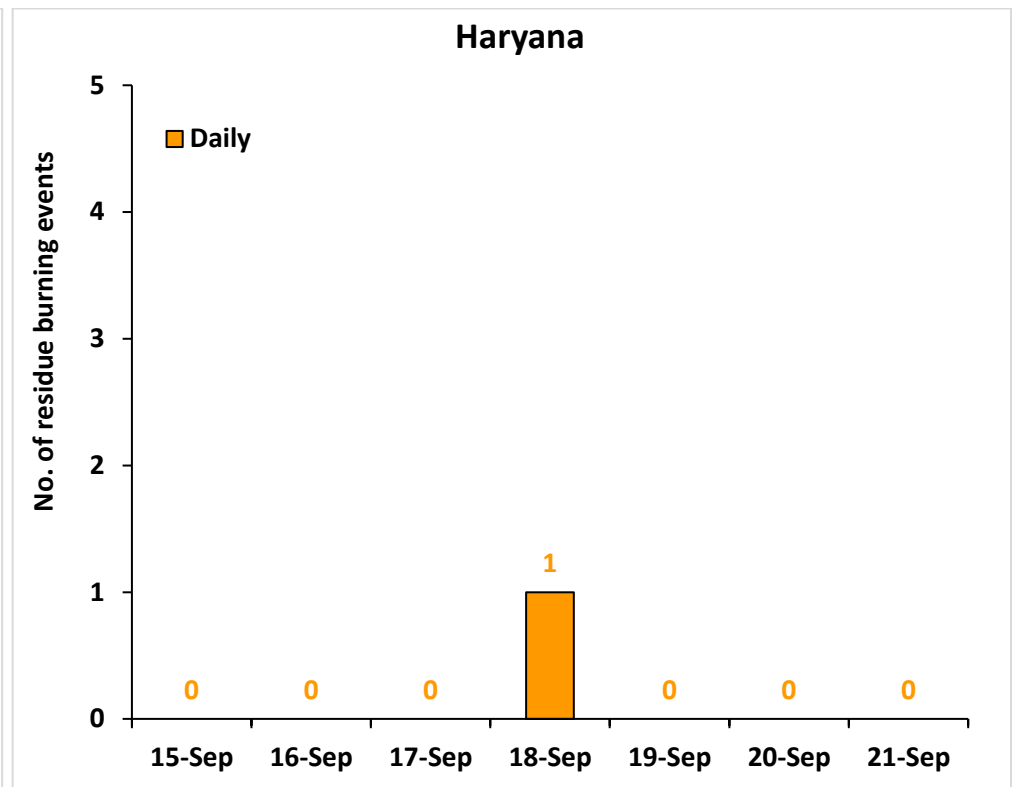
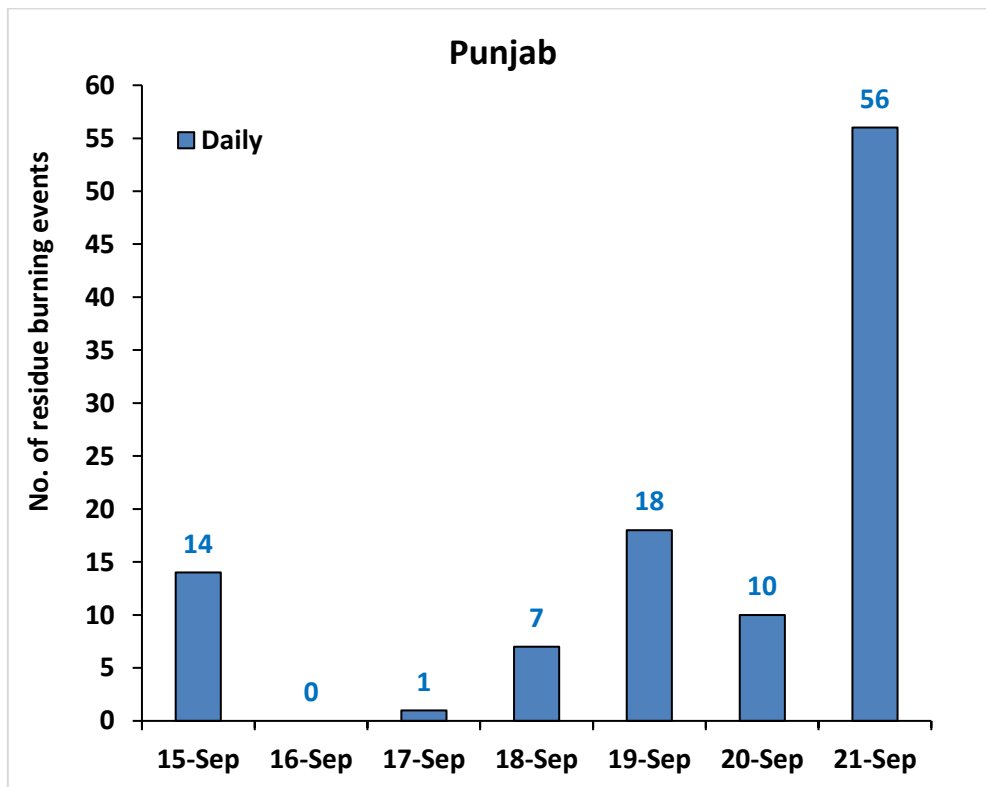
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

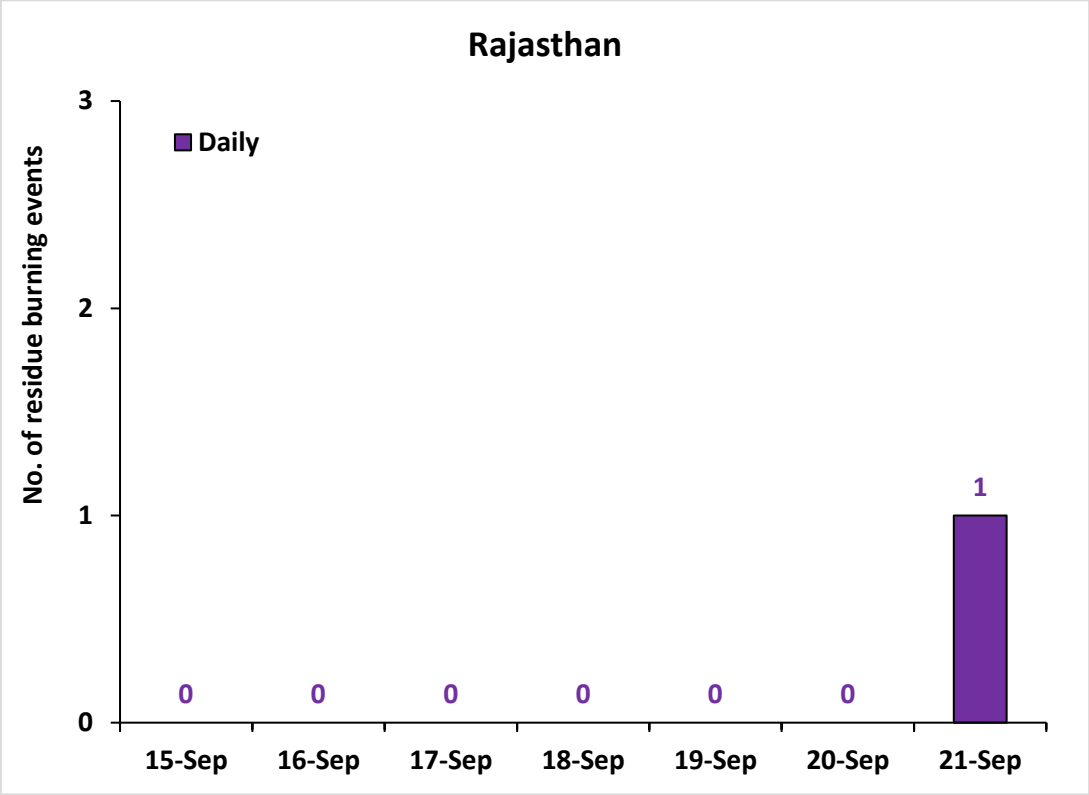
<http://creams.iari.res.in>

Highlights for 21-Sep-2022

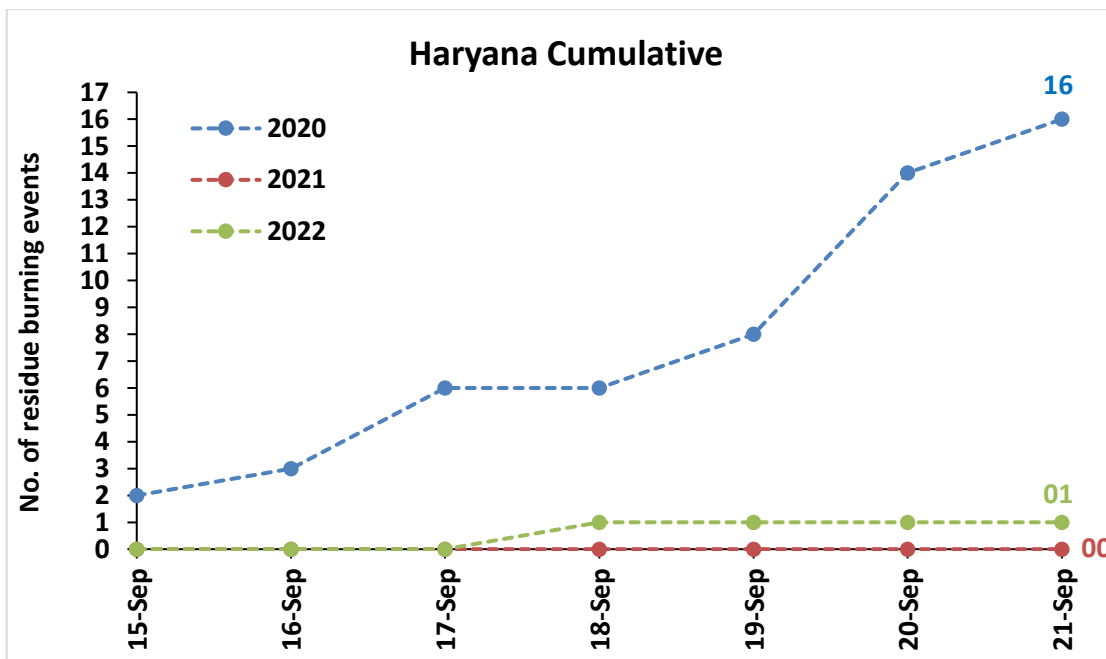
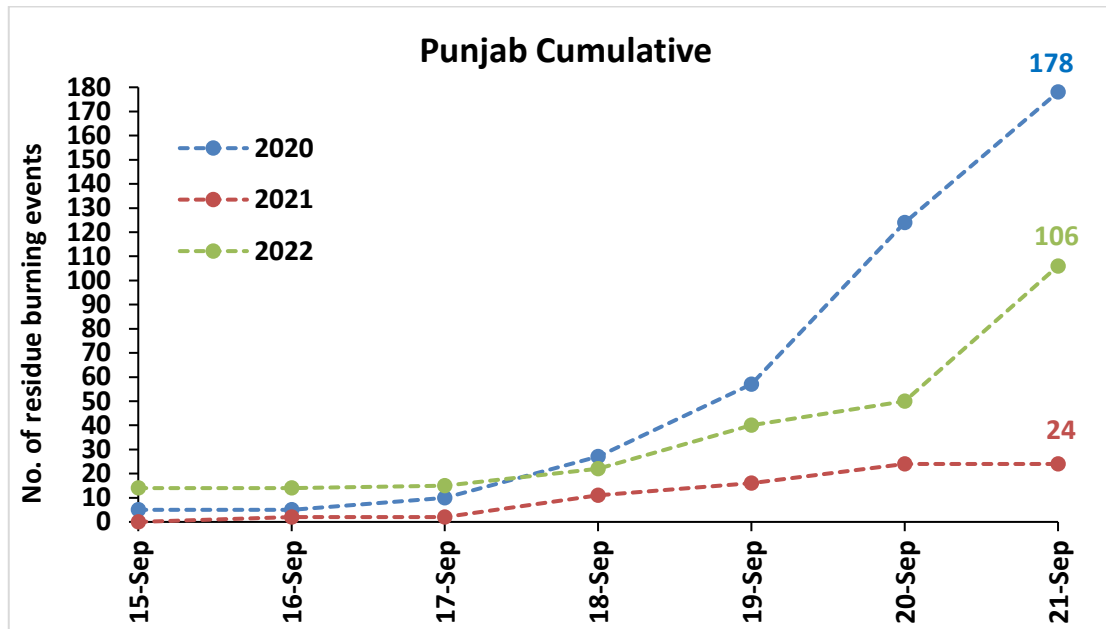
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **57** residue burning events in the six study States on 21-Sep-2022.
- The state wise events detected on 21-Sep-2022 were **56** in Punjab, **0** in Haryana, **0** in UP, **0** in Delhi, **1** in Rajasthan and **0** in MP.
- Detection of residue burning events was hampered by the presence of clouds over East Punjab, Haryana, Delhi, Uttar Pradesh and Eastern Madhya Pradesh.

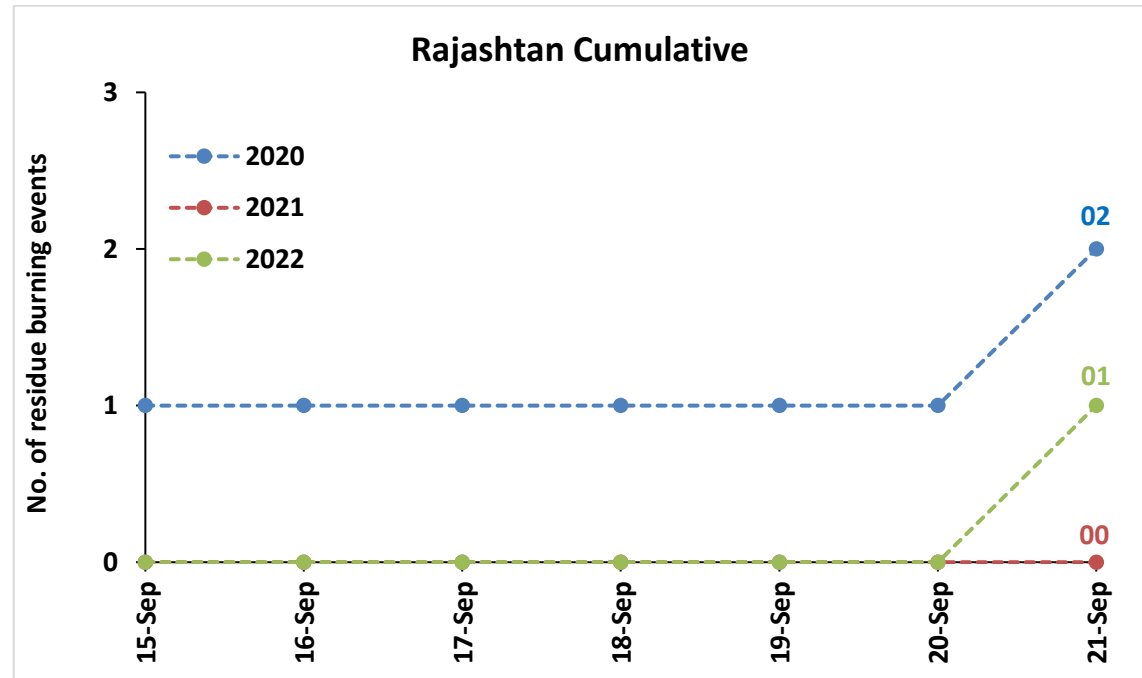
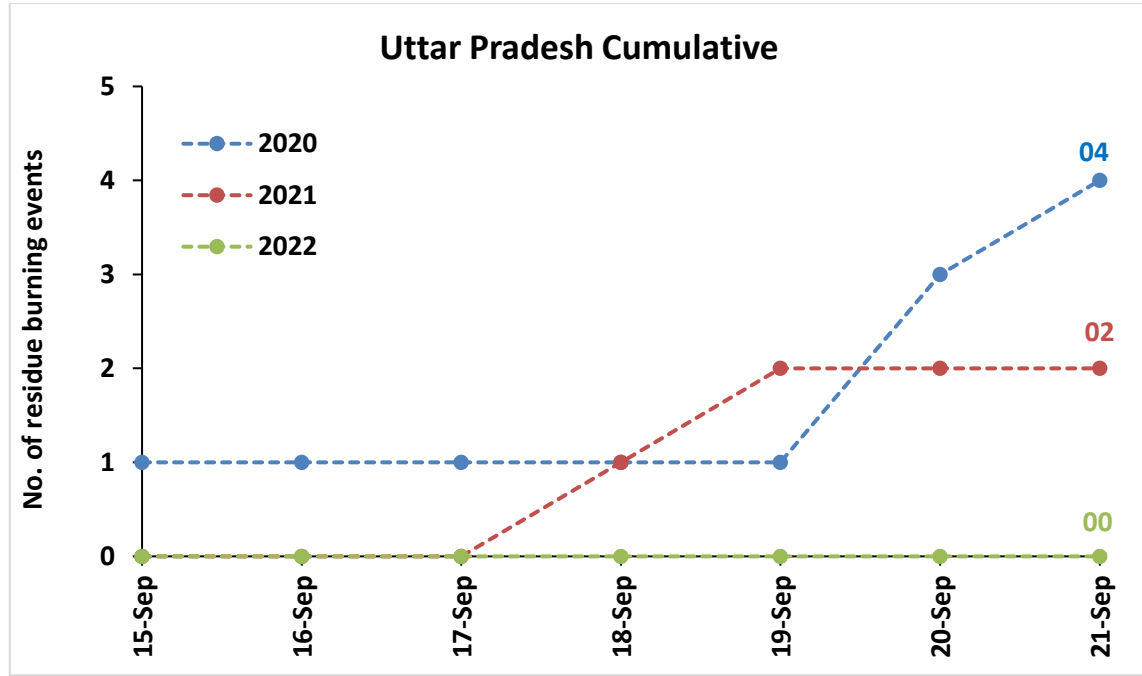
Temporal distribution of rice residue burning events for the study States in 2022

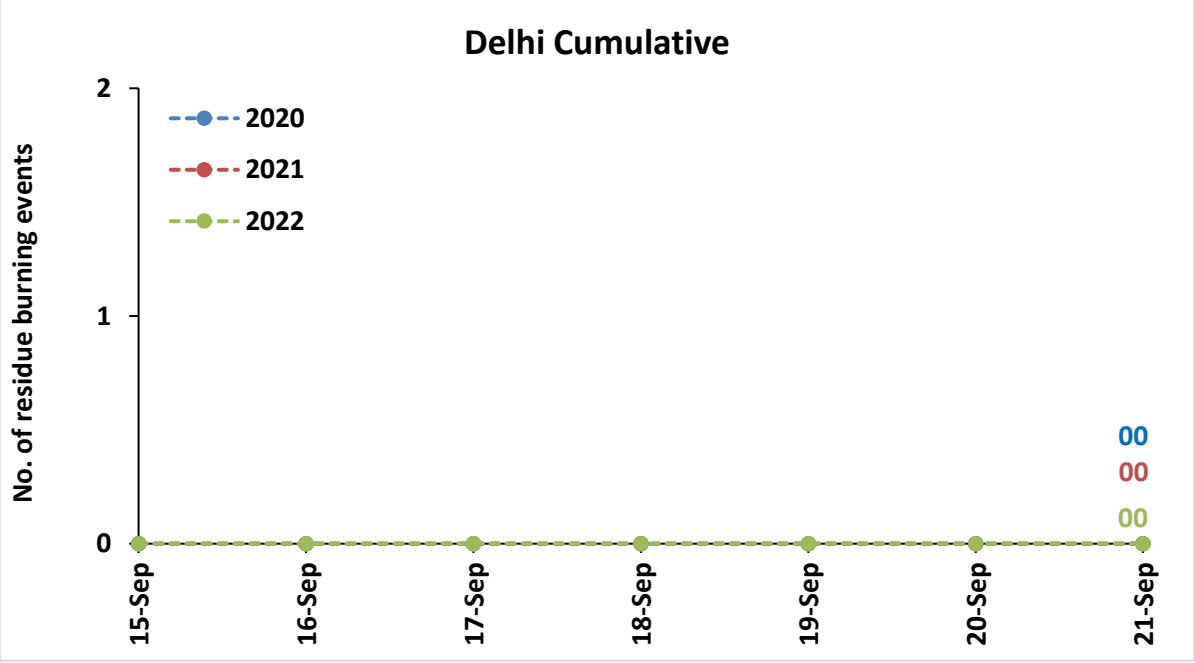
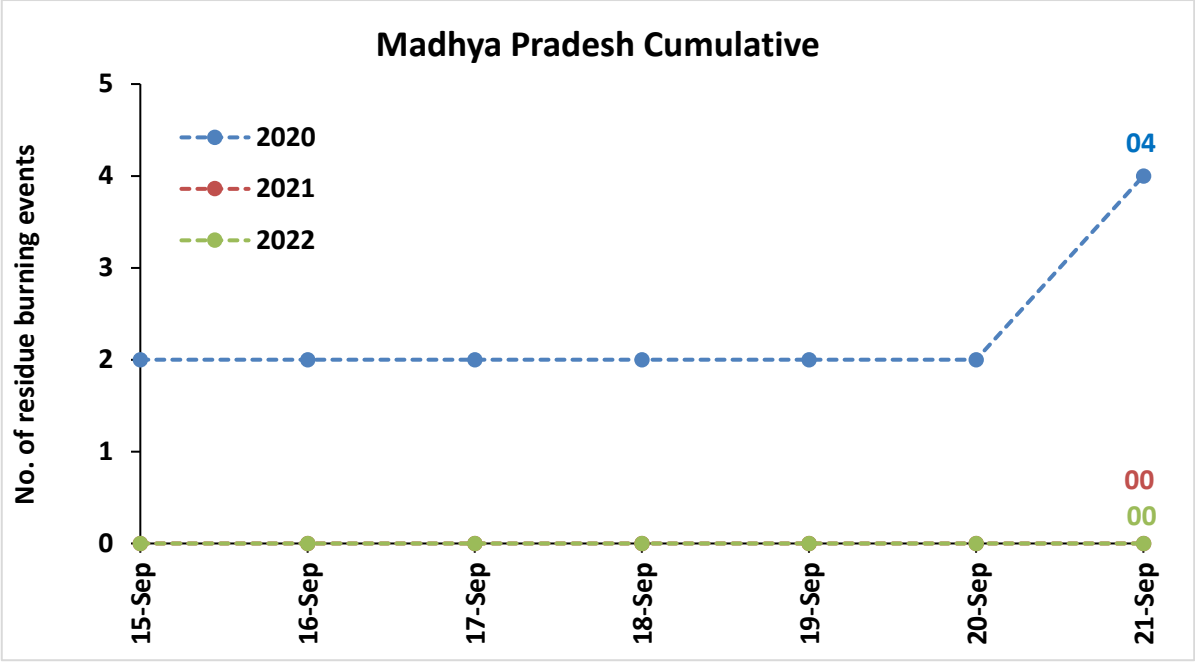




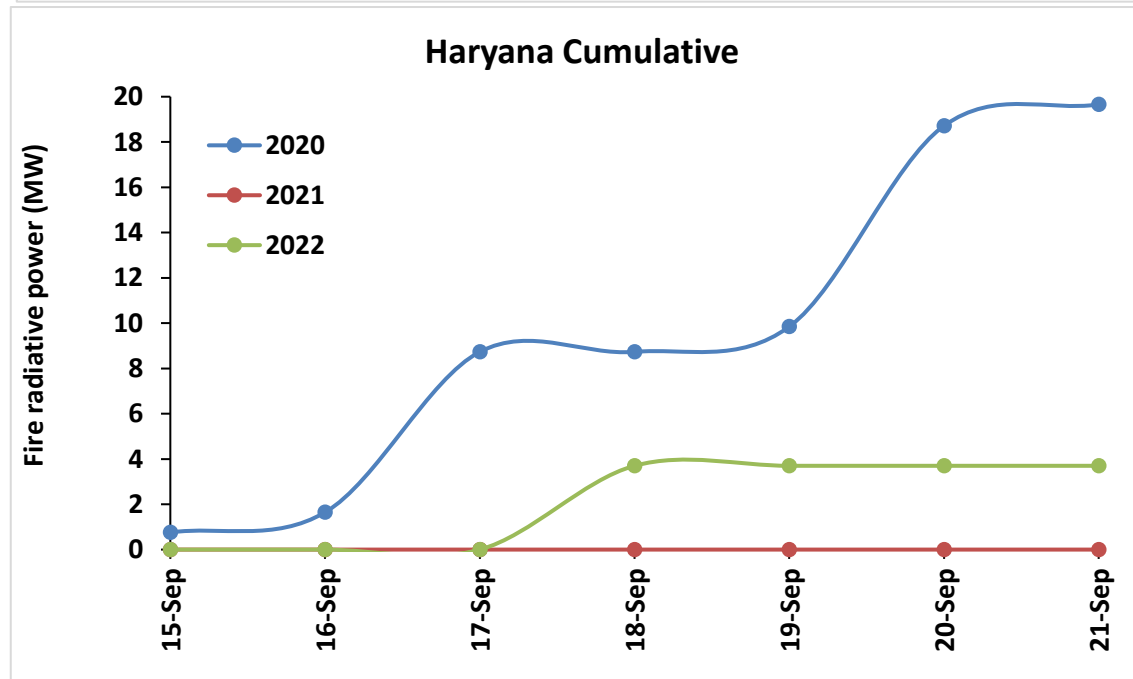
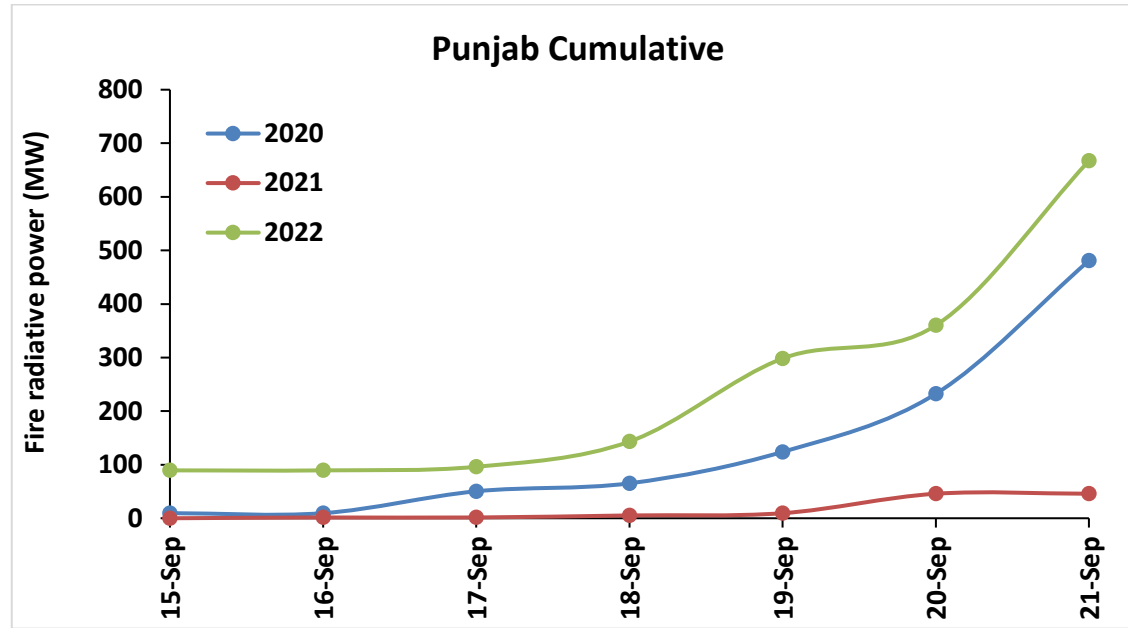
Comparison of residue burning events in current year (2022) with previous year (2020 and 2021) for the study States

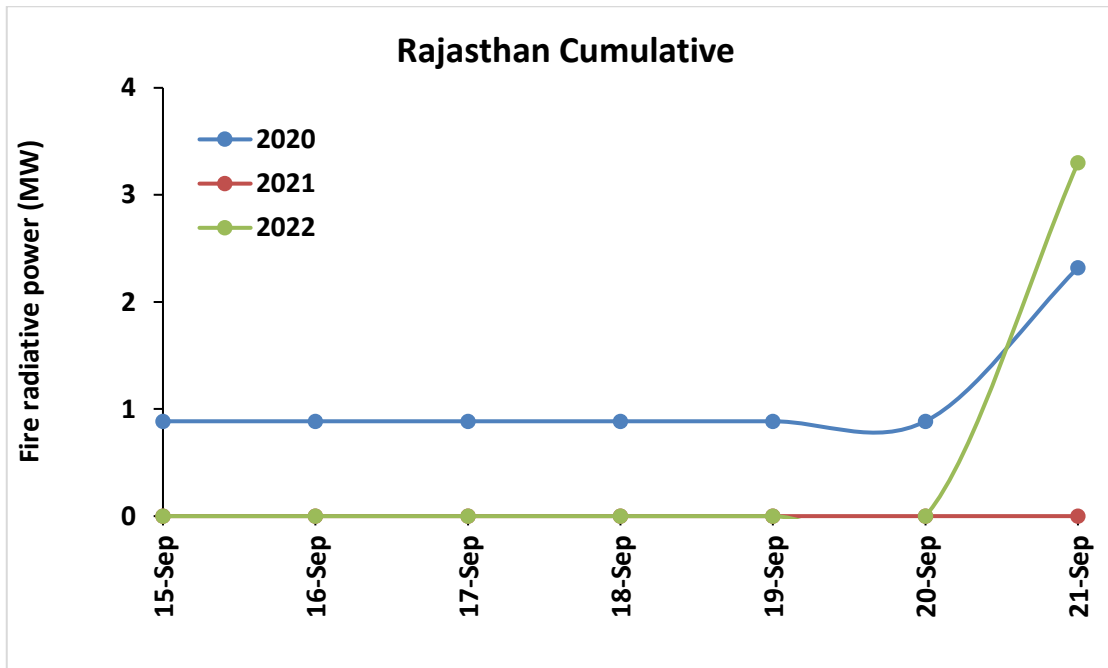
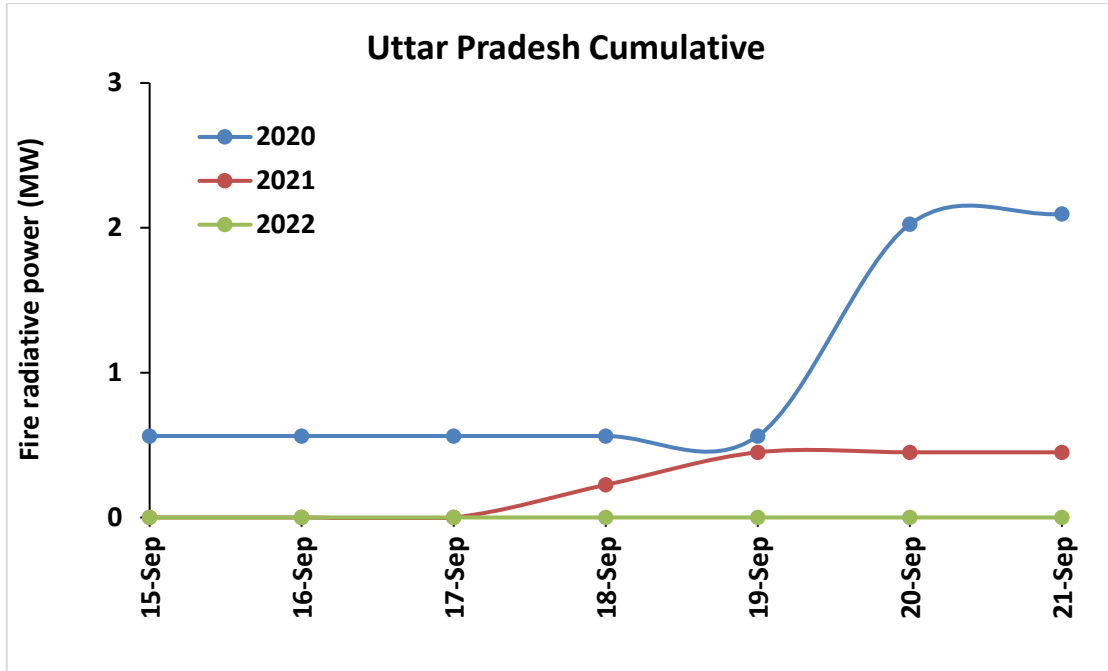


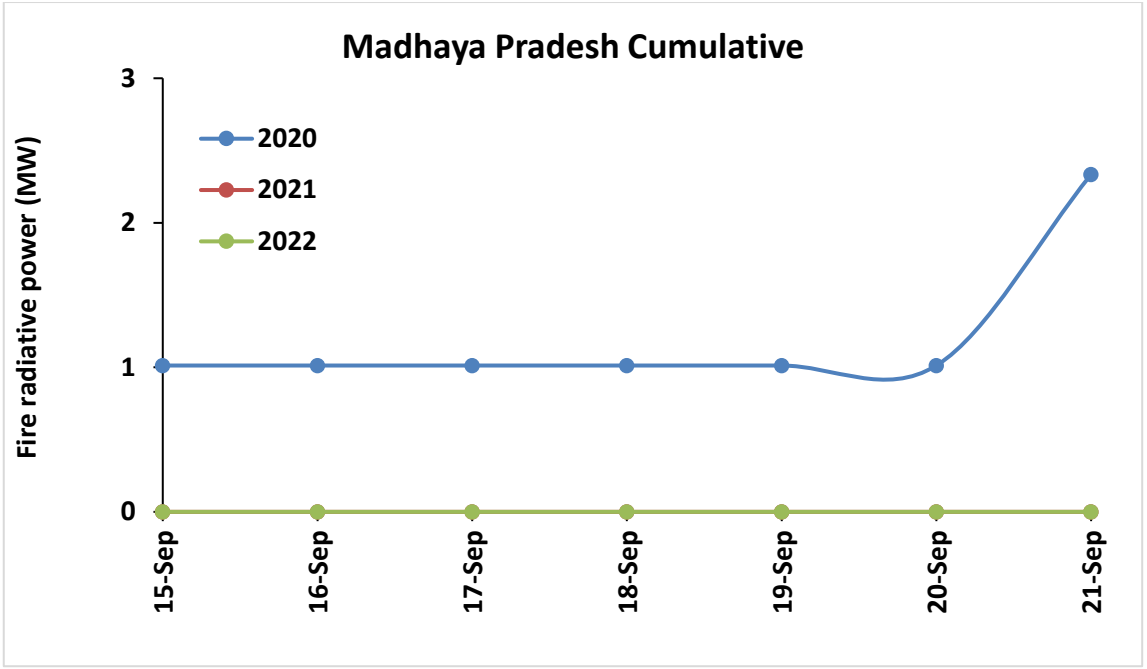




Comparison of residue burning fire power in current year (2022) with previous year (2021 and 2020) for the study States

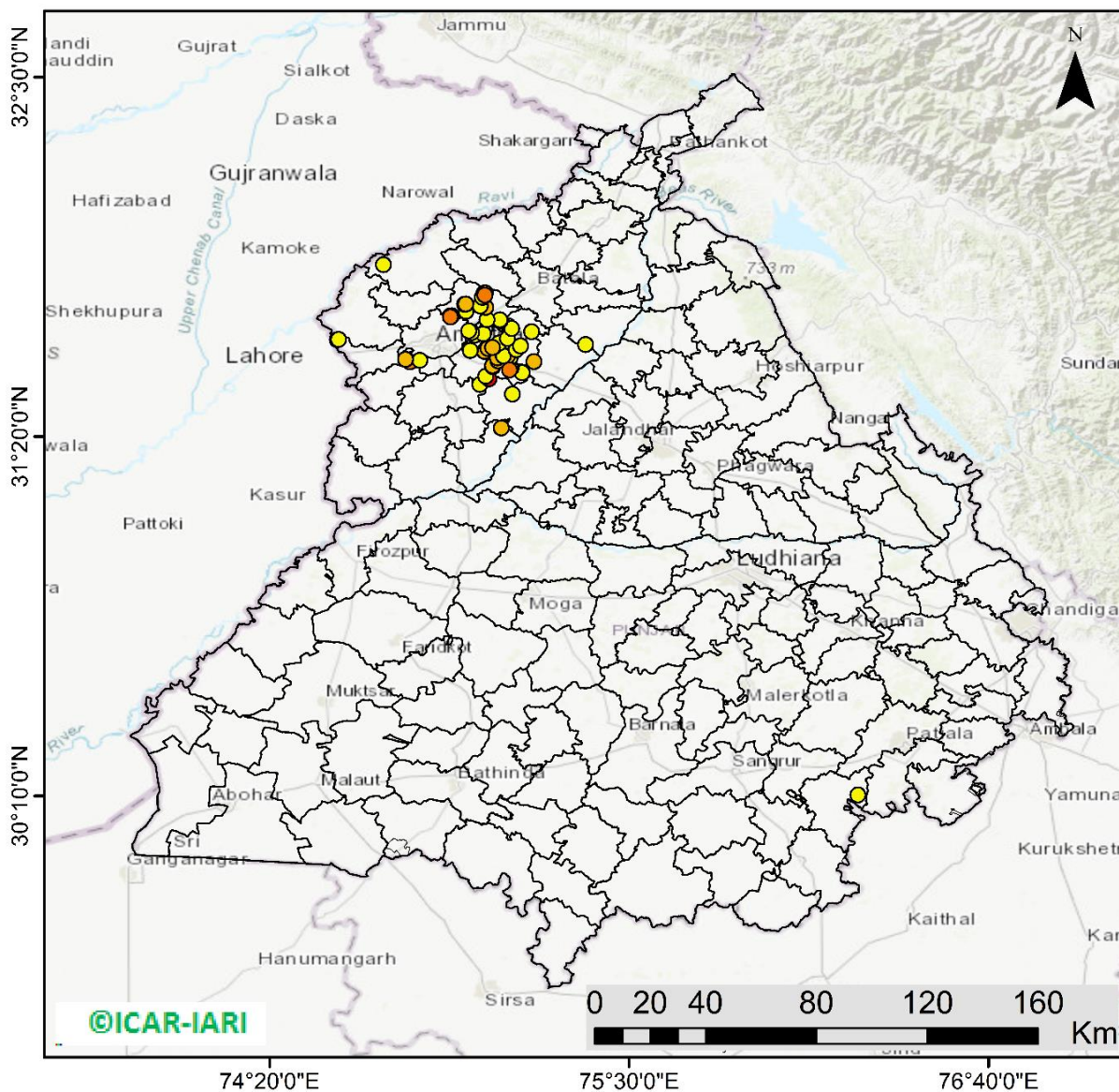






Punjab

RICE RESIDUE BURNING IN PUNJAB



56 burning events detected in Punjab during (21st Sep 2022)

Fire Intensity (W/m²)

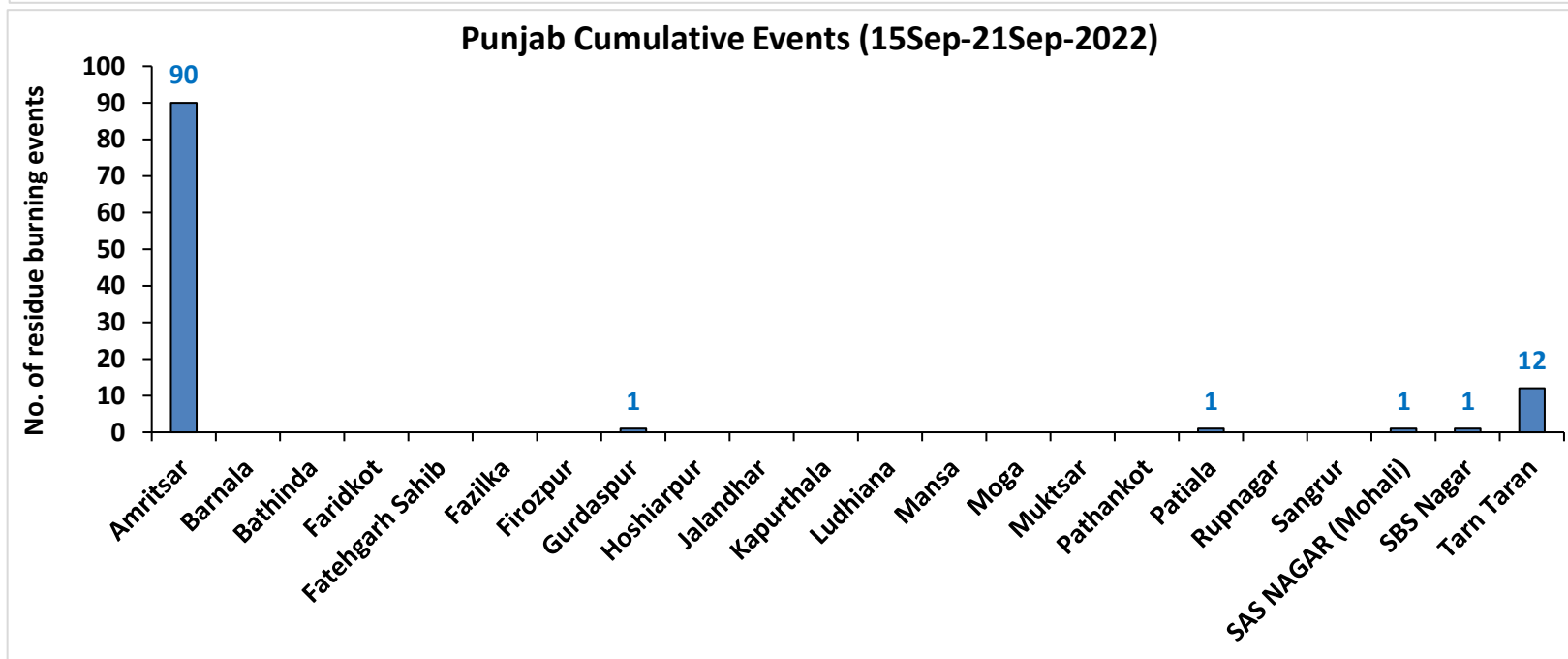
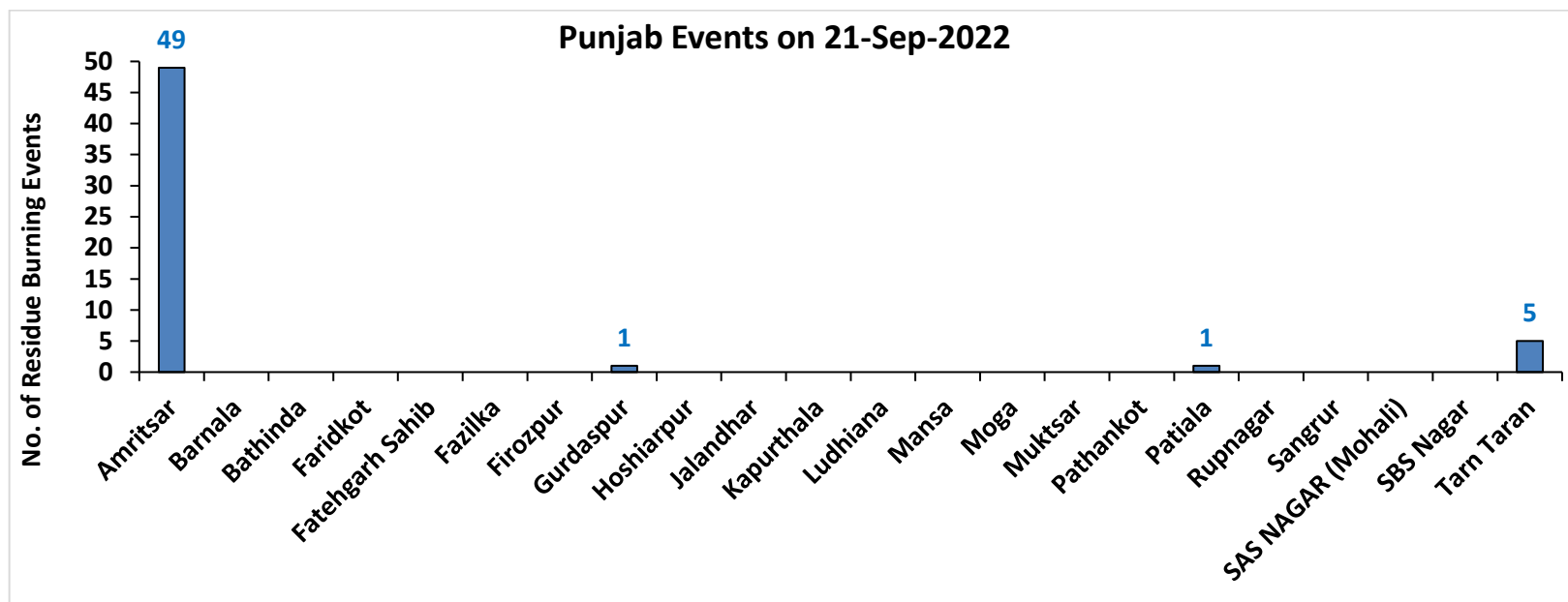
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20

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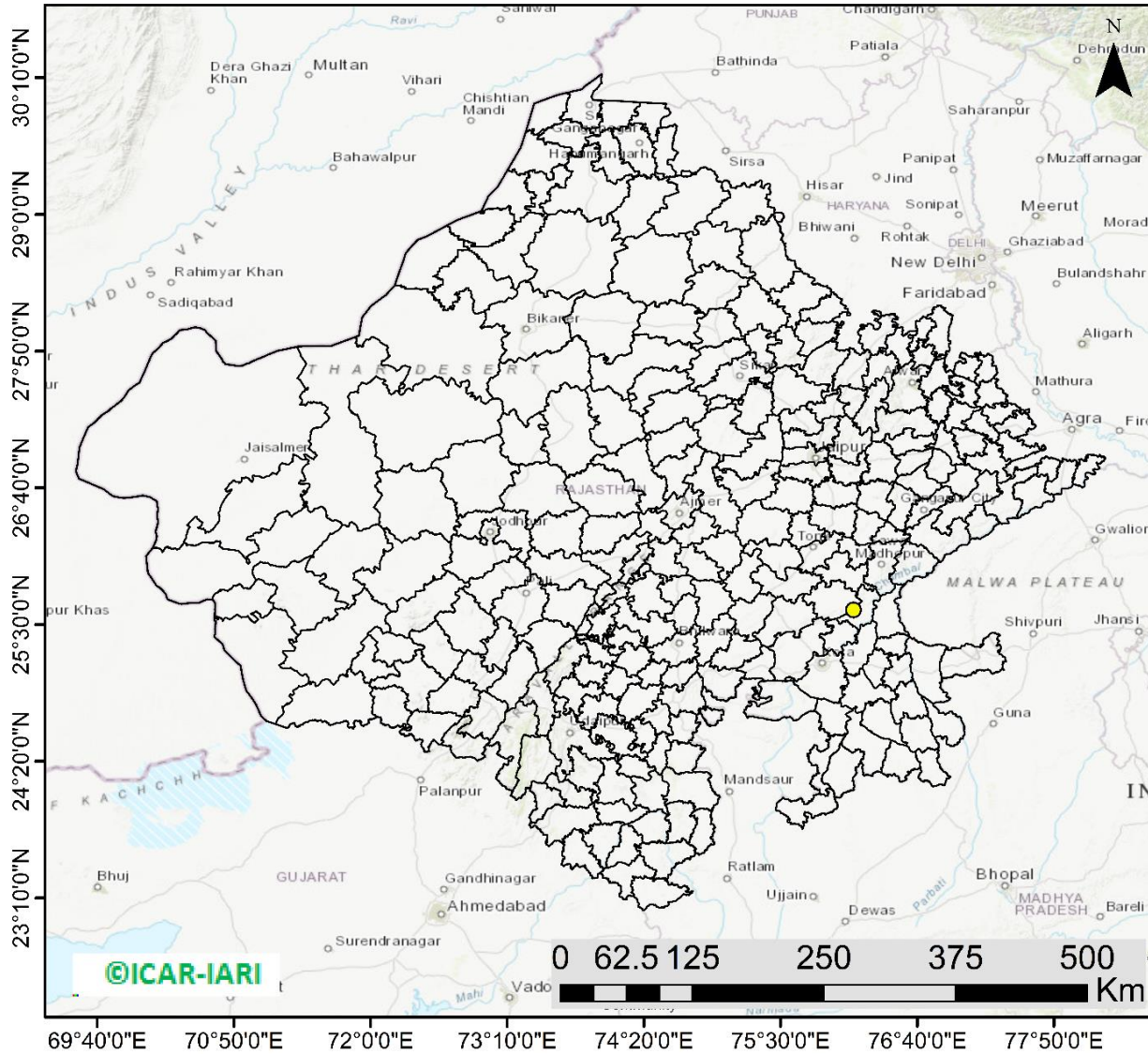
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 21Sep-2022)



Rajasthan

RICE RESIDUE BURNING IN RAJASTHAN



01 burning events detected in Rajasthan on (21st Sep 2022)

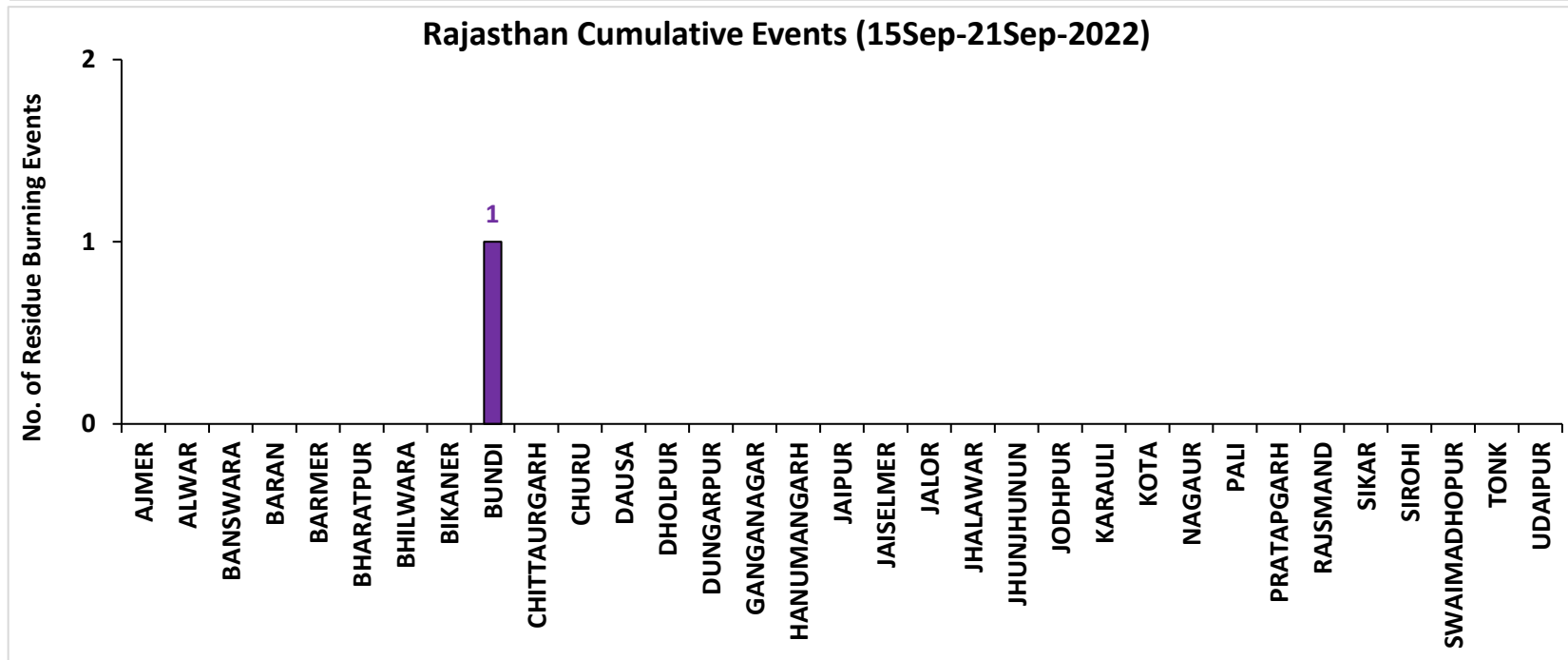
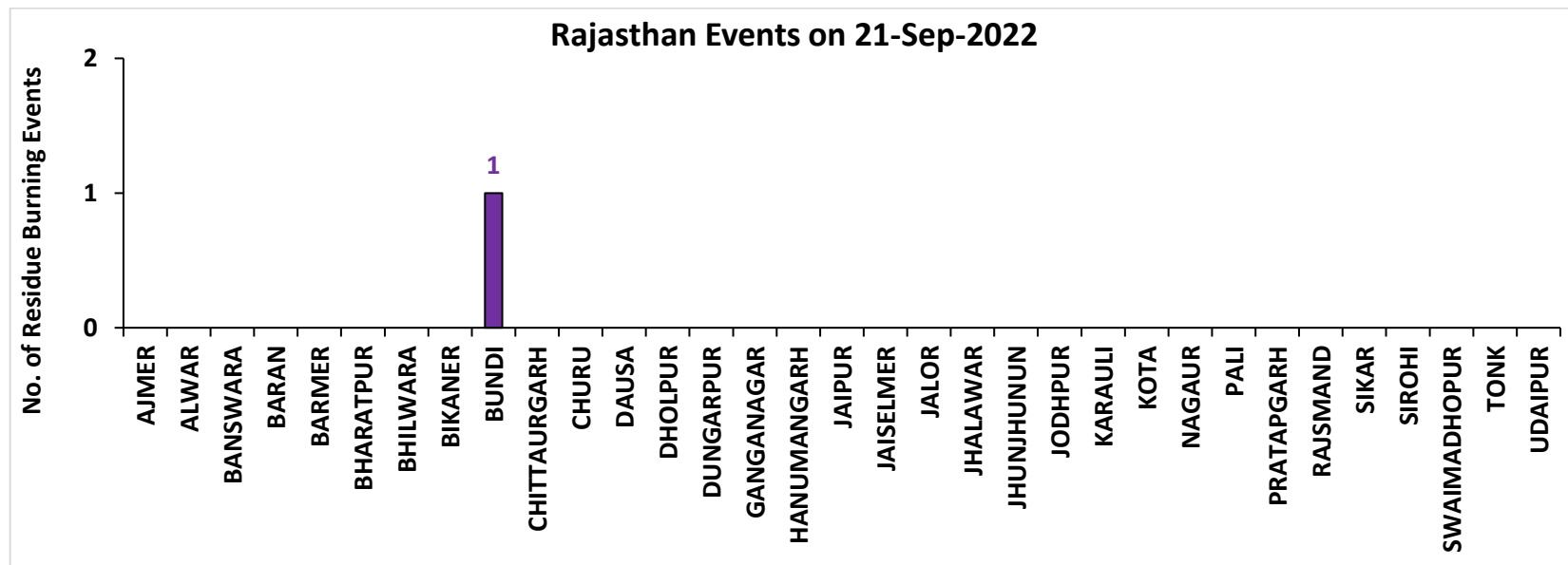
Fire Intensity (W/m²)

- 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 Rajasthan (15Sep- 21Sep-2022)



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

(a) Punjab

District	15 Sep-21 Sep 2022		
	2020	2021	2022
Amritsar	163	19	90
Barnala	0	0	0
Bathinda	0	0	0
Faridkot	0	1	0
Fatehgarh Sahib	0	0	0
Fazilka	0	0	0
Firozpur	0	0	0
Gurdaspur	1	0	1
Hoshiarpur	0	0	0
Jalandhar	0	0	0
Kapurthala	2	0	0
Ludhiana	2	0	0
Mansa	1	0	0
Moga	0	0	0
Muktsar	1	0	0
Pathankot	0	0	0
Patiala	0	3	1
Rupnagar	0	0	0
Sangrur	0	0	0
SAS NAGAR (Mohali)	1	0	1
SBS Nagar	0	0	1
Tarn Taran	7	1	12
Total	178	24	106

(b) Haryana

District	15 Sep-21 Sep 2022		
	2020	2021	2022
AMBALA	2	0	0
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	1	0	0
GURGAON	0	0	0
HISAR	0	0	0
JHAJJAR	0	0	0
JIND	0	0	1
KAITHAL	0	0	0
KARNAL	9	0	0
KURUKSHETRA	2	0	0
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	0	0	0
PANCHKULA	0	0	0
PANIPAT	1	0	0
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	1	0	0
SONIPAT	0	0	0
YAMUNANAGAR	0	0	0
Total	16	0	1

(c) Uttar Pradesh

District	15 Sep-21 Sep 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	0	0	0	MUZAFARNAGAR	0	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	0	0	0
ALIGARH	0	0	0	GHAZIABAD	0	0	0	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	0	1	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	1	0	0
AMROHA	0	0	0	HAPUR	1	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	0	0	0	HARDOI	0	0	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	0	0	0
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	1	0	0
BAGHPAT	0	0	0	JAUNPUR	0	0	0	SHARANPUR	0	0	0
BAHRAICH	0	0	0	JHANSI	0	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	0	0	0	SIDDHARTHANAGAR	0	0	0
BALRAMPUR	0	0	0	KANPUR	0	1	0	SITAPUR	0	0	0
BANDA	0	0	0	KANPUR DEHAT	0	0	0	SONBHADRA	0	0	0
BARABANKI	0	0	0	KASGANJ	0	0	0	SULTANPUR	0	0	0
BAREILLY	0	0	0	KAUSHAMBI	0	0	0	UNNAO	0	0	0
BASTI	0	0	0	KHERI	0	0	0	VARANASI	0	0	0
BIJNOR	0	0	0	KUSHINAGAR	0	0	0	Total	4	2	0
BULANDSAHAR	0	0	0	LALITPUR	0	0	0				
CHANDAULI	0	0	0	LUCKNOW	0	0	0				
CHITRAKOOT	0	0	0	MAHARAJGANJ	0	0	0				
DEORIA	0	0	0	MAHOBA	0	0	0				
ETAH	0	0	0	MAINPURI	0	0	0				
ETAWAH	0	0	0	MATHURA	0	0	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	0	0	0				
FATEHPUR	0	0	0	MIRZAPUR	0	0	0				
FIROZABAD	0	0	0	MORADABAD	0	0	0				

(d) Delhi

District	15 Sep-21 Sep 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	0	0	0
NORTH EAST	0	0	0
NORTH WEST DELHI	0	0	0
SHAHADRA	0	0	0
SOUTH	0	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
Total	0	0	0

(e) Rajasthan

District	15 Sep-21 Sep 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	0	0	0
BANSWARA	0	0	0
BARAN	0	0	0
BARMER	0	0	0
BHARATPUR	0	0	0
BHILWARA	1	0	0
BIKANER	0	0	0
BUNDI	0	0	1
CHITTAURGARH	0	0	0
CHURU	0	0	0
DAUSA	0	0	0
DHOLPUR	0	0	0
DUNGARPUR	0	0	0
GANGANAGAR	0	0	0
HANUMANGARH	0	0	0
JAIPUR	0	0	0
JAISELMER	1	0	0
JALOR	0	0	0
JHALAWAR	0	0	0
JHUNJHUNUN	0	0	0
JODHPUR	0	0	0
KARALI	0	0	0
KOTA	0	0	0
NAGOUR	0	0	0
PALI	0	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	0	0	0
SWAIMADHOPUR	0	0	0
TONK	0	0	0
UDAIPUR	0	0	0
Total	2	0	1

(f) Madhya Pradesh

District	15 Sep-21 Sep 2022						
	2020	2021	2022	PANNA	0	0	0
ALIRAJPUR	0	0	0	RAISEN	0	0	0
ANUPPUR	0	0	0	RAJGARH	0	0	0
ASHOKNAGAR	0	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	0	0	0
BARWANI	0	0	0	SAGAR	2	0	0
BETUL	0	0	0	SATNA	0	0	0
BHIND	0	0	0	SEHORE	0	0	0
BHOPAL	0	0	0	SEONI	0	0	0
BURHANPUR	0	0	0	SHAHDOL	0	0	0
CHHATARPUR	0	0	0	SHAJAPUR	0	0	0
CHHINDWARA	0	0	0	SHEOPUR	0	0	0
DAMOH	0	0	0	SHIVPURI	0	0	0
DATIA	0	0	0	SIDHI	0	0	0
DEWAS	0	0	0	SINGRAULI	0	0	0
DHAR	0	0	0	TIKAMGARH	0	0	0
DINDORI	0	0	0	UJJAIN	0	0	0
EAST NIMAR	0	0	0	UMARIA	0	0	0
GUNA	0	0	0	VIDESHA	0	0	0
GWALIOR	0	0	0	WEST NIMAR	0	0	0
HARDA	2	0	0	Total	4	0	0
HOSHANGABAD	0	0	0				
INDORE	0	0	0				
JABALPUR	0	0	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	0	0	0				
NARSHIMAPURA	0	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- 21 September 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
Total	178	24	106	16	0	1	4	2	0	0	0	0	2	0	1	4	0	0

Details of residue burning events in Punjab on 21-Sep-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	AMRITSAR	AJNALA	S-NPP	31.89090	74.70270	13:29:27	D	2.80
2	AMRITSAR	ATTARI	S-NPP	31.57520	74.78850	13:29:27	D	14.10
3	AMRITSAR	ATTARI	S-NPP	31.58020	74.82080	13:29:27	D	4.20
4	AMRITSAR	ATTARI	S-NPP	31.58330	74.77440	13:29:27	D	5.50
5	AMRITSAR	ATTARI	S-NPP	31.64720	74.55280	13:29:27	D	3.00
6	AMRITSAR	ATTARI	S-NPP	31.64790	74.55690	13:29:27	D	3.00
7	AMRITSAR	JANDIALA GURU	S-NPP	31.55490	75.11680	13:29:27	D	3.60
8	AMRITSAR	JANDIALA GURU	S-NPP	31.55950	75.05770	13:29:27	D	5.20
9	AMRITSAR	JANDIALA GURU	S-NPP	31.56280	75.05700	13:29:27	D	6.00
10	AMRITSAR	JANDIALA GURU	S-NPP	31.57910	75.07440	13:29:27	D	6.90
11	AMRITSAR	JANDIALA GURU	S-NPP	31.58820	75.07270	13:29:27	D	5.70
12	AMRITSAR	JANDIALA GURU	S-NPP	31.59460	75.09210	13:29:27	D	2.40
13	AMRITSAR	JANDIALA GURU	S-NPP	31.60910	75.03090	13:29:27	D	5.30
14	AMRITSAR	JANDIALA GURU	S-NPP	31.61220	74.98460	13:29:27	D	2.40
15	AMRITSAR	JANDIALA GURU	S-NPP	31.62390	75.06110	13:29:27	D	6.60
16	AMRITSAR	JANDIALA GURU	S-NPP	31.62410	75.04030	13:29:27	D	9.50
17	AMRITSAR	JANDIALA GURU	S-NPP	31.66640	75.02730	13:29:27	D	1.60
18	AMRITSAR	JANDIALA GURU	AQUA	31.54900	75.11200	13:28:36	D	11.60
19	AMRITSAR	JANDIALA GURU	AQUA	31.61900	75.04200	13:28:36	D	9.40
20	AMRITSAR	JANDIALA GURU	AQUA	31.62200	75.05700	13:28:36	D	9.60
21	AMRITSAR	MAJITHA	S-NPP	31.70830	75.08140	13:29:27	D	4.80
22	AMRITSAR	MAJITHA	S-NPP	31.71160	75.08070	13:29:27	D	4.80
23	AMRITSAR	MAJITHA	S-NPP	31.71210	75.03900	13:29:27	D	3.40
24	AMRITSAR	MAJITHA	S-NPP	31.72450	74.91990	13:29:27	D	5.20
25	AMRITSAR	MAJITHA	S-NPP	31.72520	74.92390	13:29:27	D	5.20
26	AMRITSAR	MAJITHA	S-NPP	31.73920	74.97090	13:29:27	D	1.80
27	AMRITSAR	MAJITHA	S-NPP	31.75230	75.03480	13:29:27	D	5.90
28	AMRITSAR	MAJITHA	S-NPP	31.75650	75.01730	13:29:27	D	1.80
29	AMRITSAR	MAJITHA	S-NPP	31.76230	74.96610	13:29:27	D	4.80
30	AMRITSAR	MAJITHA	S-NPP	31.76290	74.97020	13:29:27	D	8.90

31	AMRITSAR	MAJITHA	S-NPP	31.78470	75.02390	13:29:27	D	2.40
32	AMRITSAR	MAJITHA	S-NPP	31.79840	75.02960	13:29:27	D	5.00
33	AMRITSAR	MAJITHA	S-NPP	31.79900	75.03360	13:29:27	D	5.00
34	AMRITSAR	MAJITHA	AQUA	31.72100	74.92000	13:28:36	D	14.40
35	AMRITSAR	MAJITHA	AQUA	31.76300	74.97000	13:28:36	D	9.30
36	AMRITSAR	MAJITHA	AQUA	31.79200	75.03200	13:28:36	D	13.10
37	AMRITSAR	RAYYA	S-NPP	31.54000	75.15310	13:29:27	D	1.70
38	AMRITSAR	RAYYA	S-NPP	31.57640	75.19130	13:29:27	D	5.30
39	AMRITSAR	TARSIKKA	S-NPP	31.58850	75.11400	13:29:27	D	3.60
40	AMRITSAR	TARSIKKA	S-NPP	31.59310	75.10490	13:29:27	D	5.90
41	AMRITSAR	TARSIKKA	S-NPP	31.61450	75.13370	13:29:27	D	2.60
42	AMRITSAR	TARSIKKA	S-NPP	31.62690	75.14780	13:29:27	D	4.90
43	AMRITSAR	TARSIKKA	S-NPP	31.63690	75.07920	13:29:27	D	3.10
44	AMRITSAR	TARSIKKA	S-NPP	31.65110	75.10530	13:29:27	D	3.70
45	AMRITSAR	TARSIKKA	S-NPP	31.67320	75.18390	13:29:27	D	2.10
46	AMRITSAR	TARSIKKA	S-NPP	31.68380	75.11930	13:29:27	D	2.40
47	AMRITSAR	VERKA	S-NPP	31.66210	74.99910	13:29:27	D	4.30
48	AMRITSAR	VERKA	S-NPP	31.67080	74.98900	13:29:27	D	4.00
49	AMRITSAR	VERKA	S-NPP	31.67620	74.97950	13:29:27	D	2.80
50	GURDASPUR	SRI HARGOBINDPUR	S-NPP	31.63150	75.35890	13:29:27	D	1.80
51	PATIALA	SAMANA	S-NPP	30.16950	76.24300	13:29:27	D	5.00
52	TARN TARAN	CHOHLA SAHIB	S-NPP	31.36050	75.08520	13:29:27	D	6.80
53	TARN TARAN	KHADUR SAHIB	S-NPP	31.47080	75.12130	13:29:27	D	1.70
54	TARN TARAN	TARN TARAN	S-NPP	31.50200	75.01570	13:29:27	D	2.30
55	TARN TARAN	TARN TARAN	S-NPP	31.52010	75.04510	13:29:27	D	26.10
56	TARN TARAN	TARN TARAN	S-NPP	31.52880	75.03500	13:29:27	D	2.90

Details of residue burning events in Rajasthan on 21-Sep-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	BUNDI	INDRAGARH	S-NPP	25.62310	76.12310	13:29:27	D	3.30

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)
