



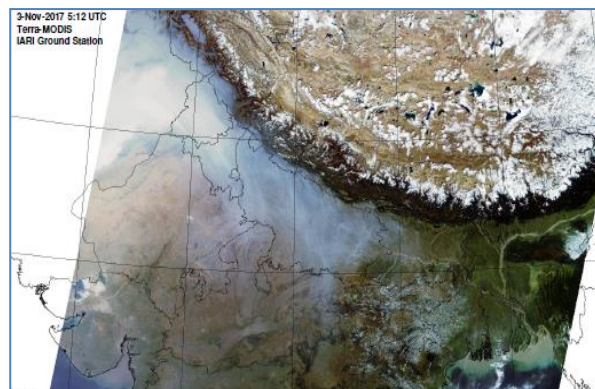
## Bulletin No. 21

Events Date:  
05-Oct-2021

Issued on:  
05-Oct-2021



# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2021



Prepared by:

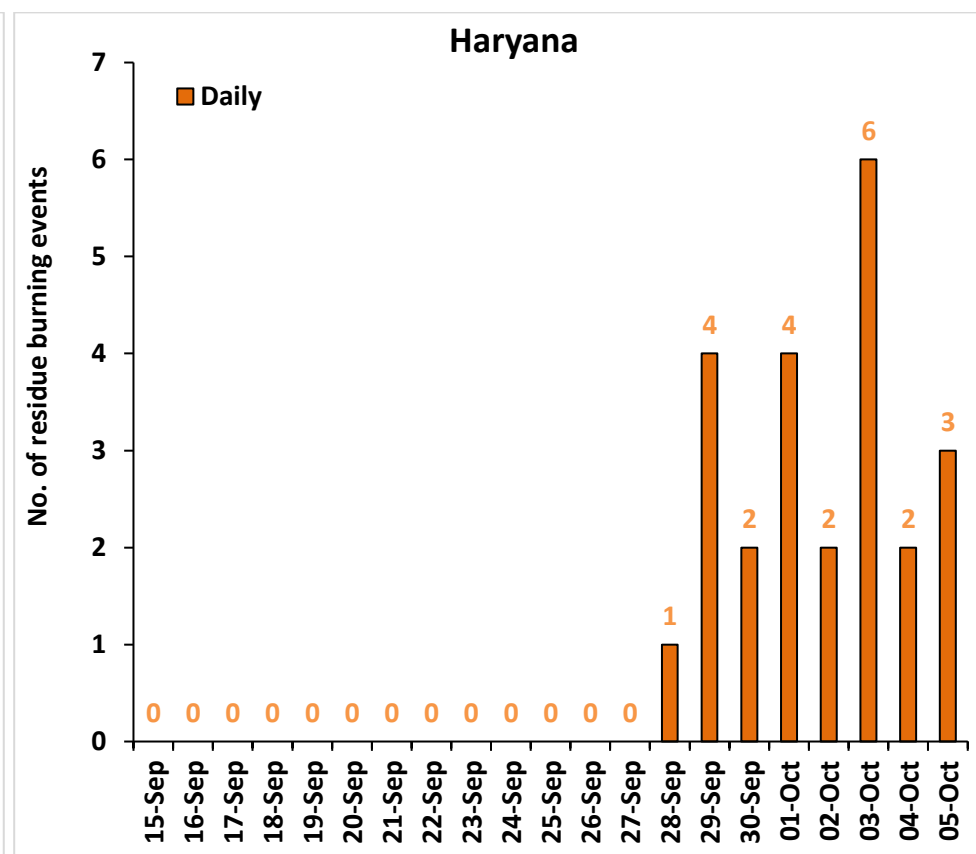
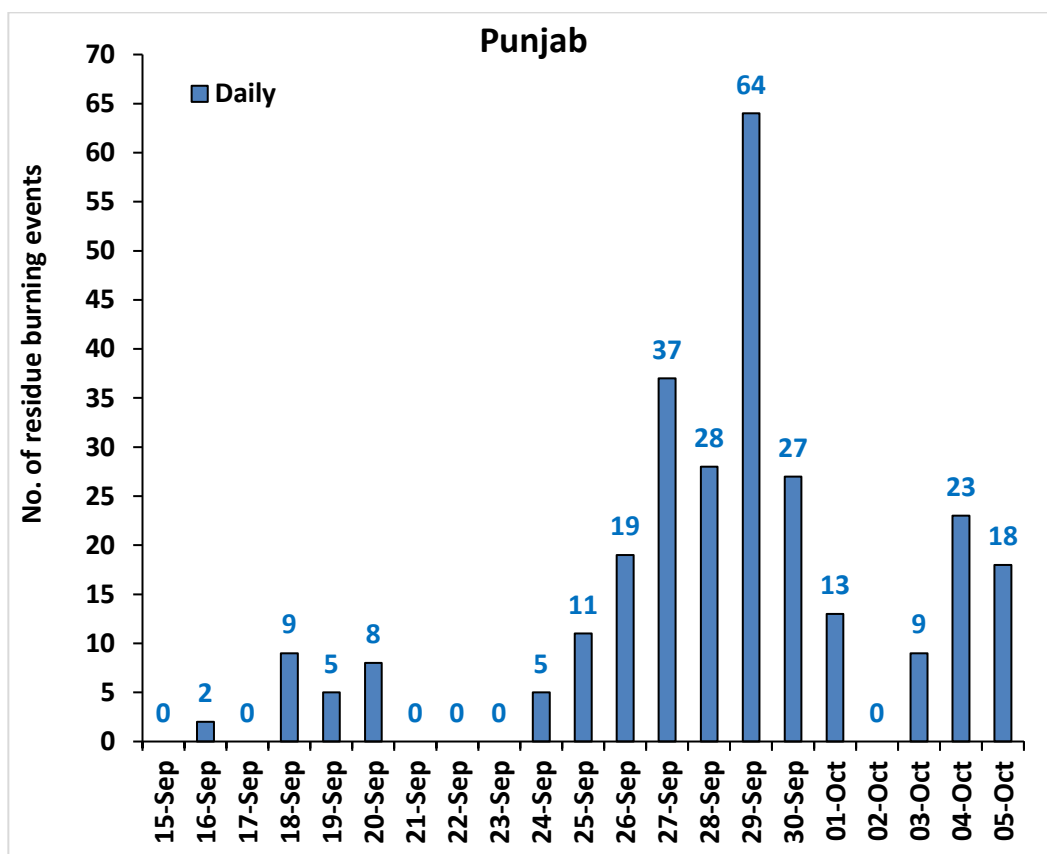
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,  
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

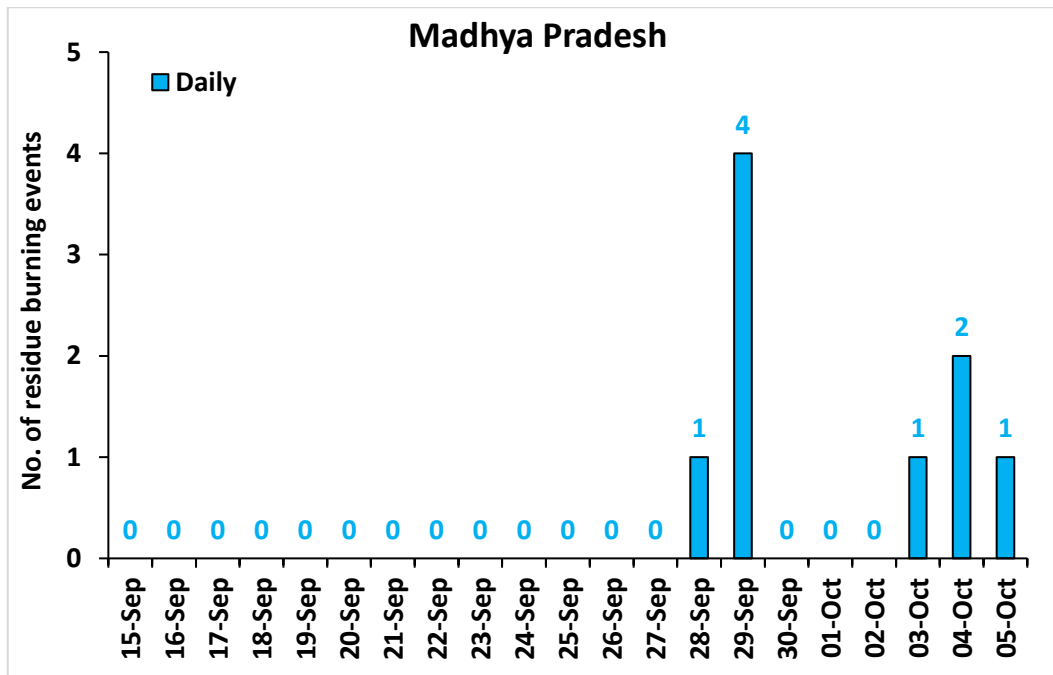
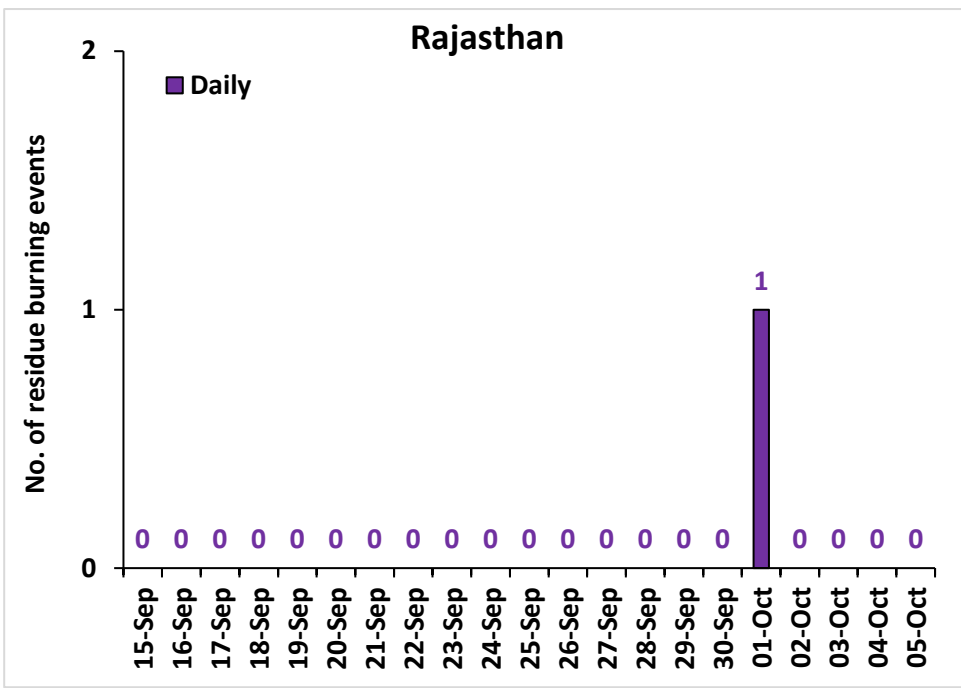
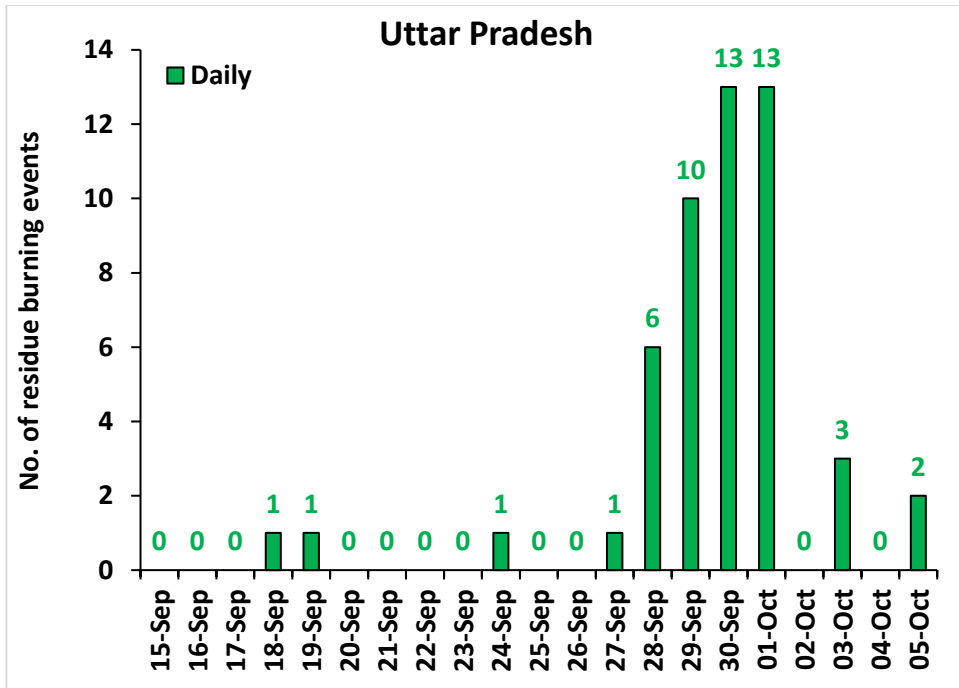
<http://creams.iari.res.in>

## Highlights for 05-October-2021

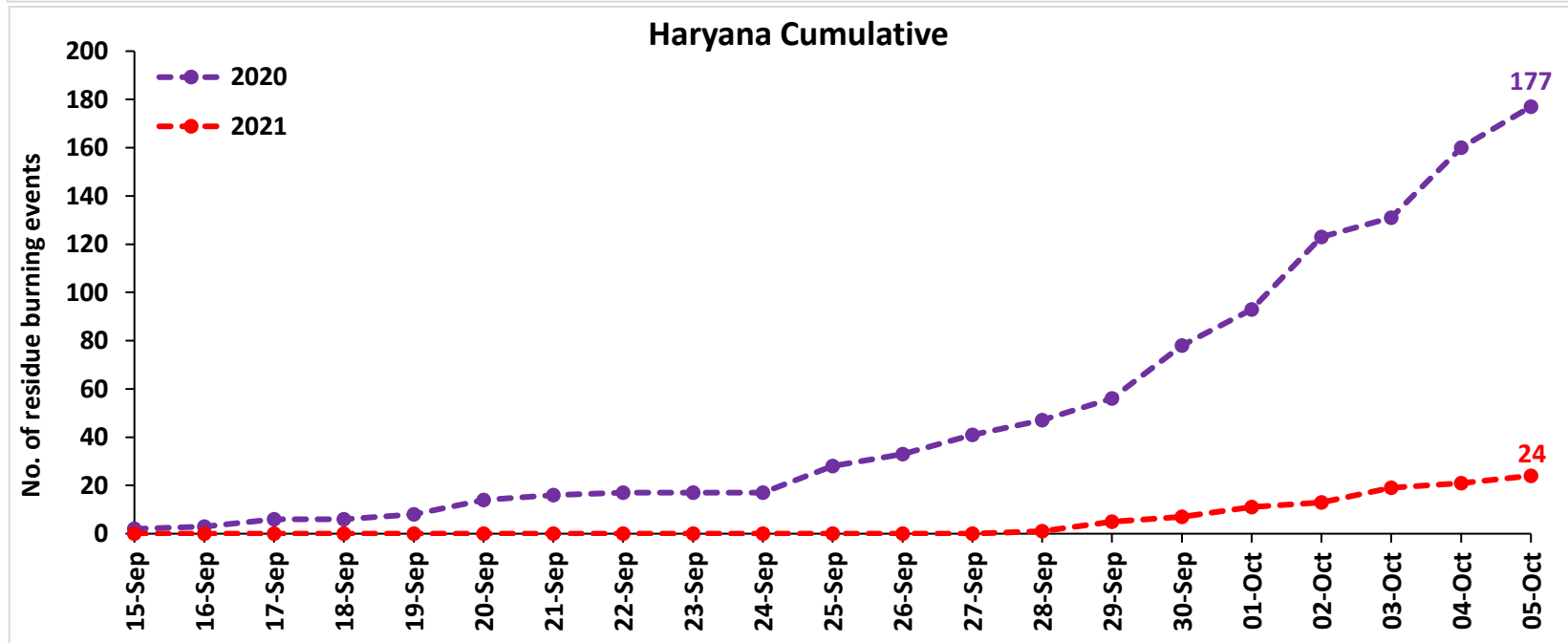
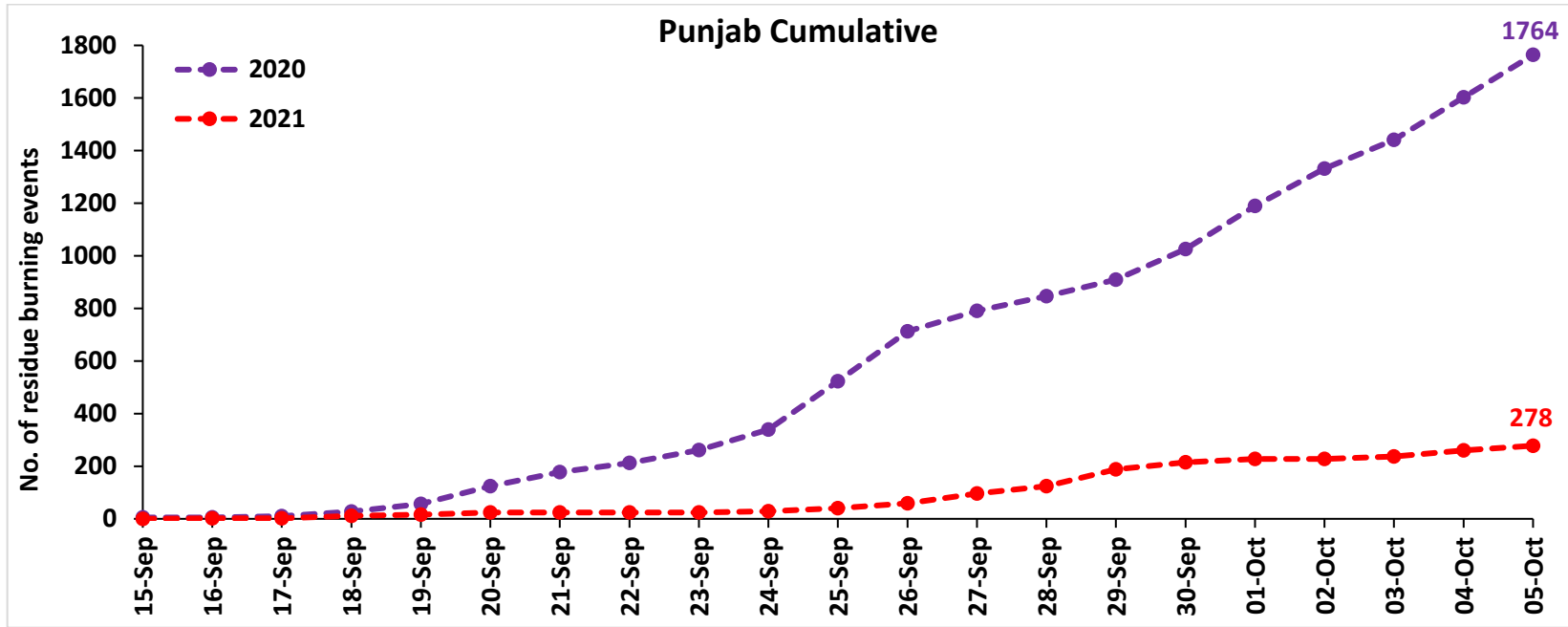
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the new "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **24** residue burning events in the six study States on 05-Oct-2021.
- The state wise events detected on 05-Oct-2021 were **18** in Punjab, **3** in Haryana, **2** in UP, **0** in Delhi, **0** in Rajasthan and **1** in MP.
- Detection of burning events by satellites was hampered due to scattered clouds over all the study states.

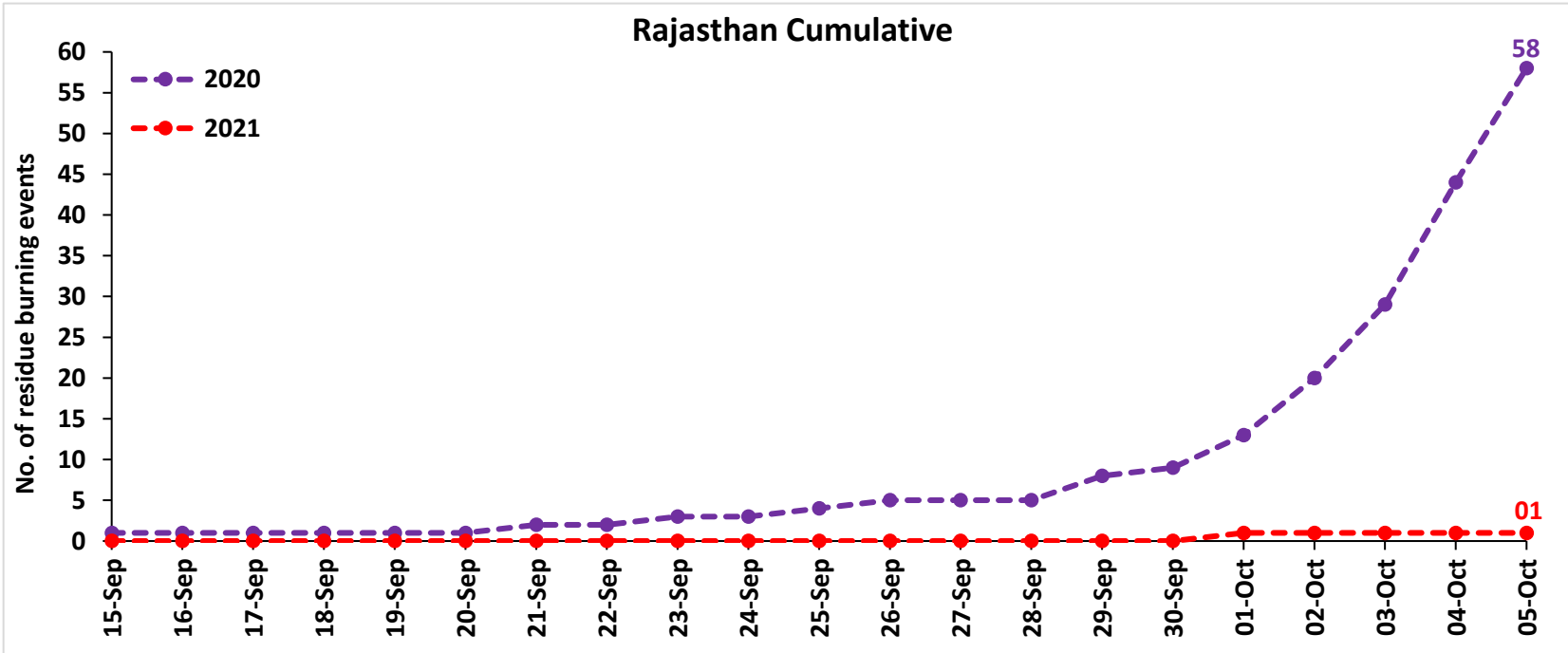
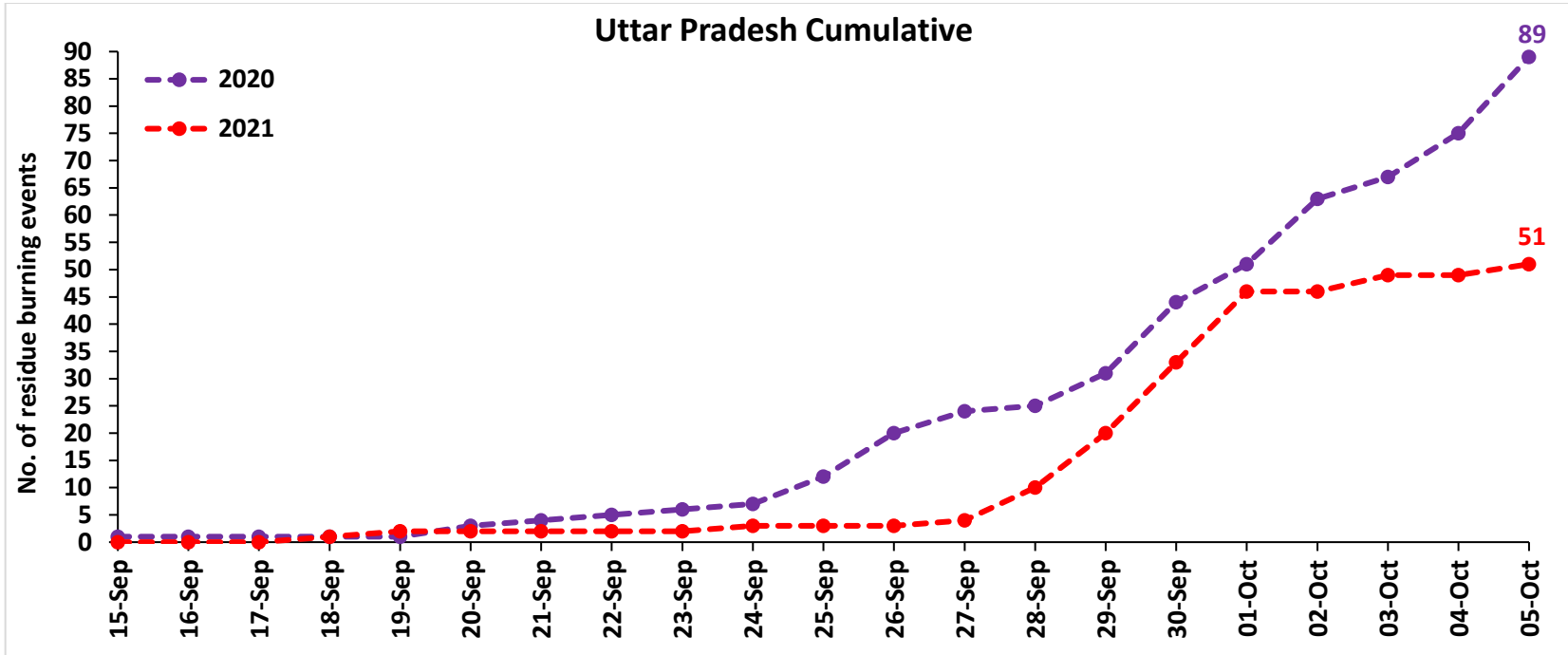
### Temporal distribution of rice residue burning events for the study States in 2021

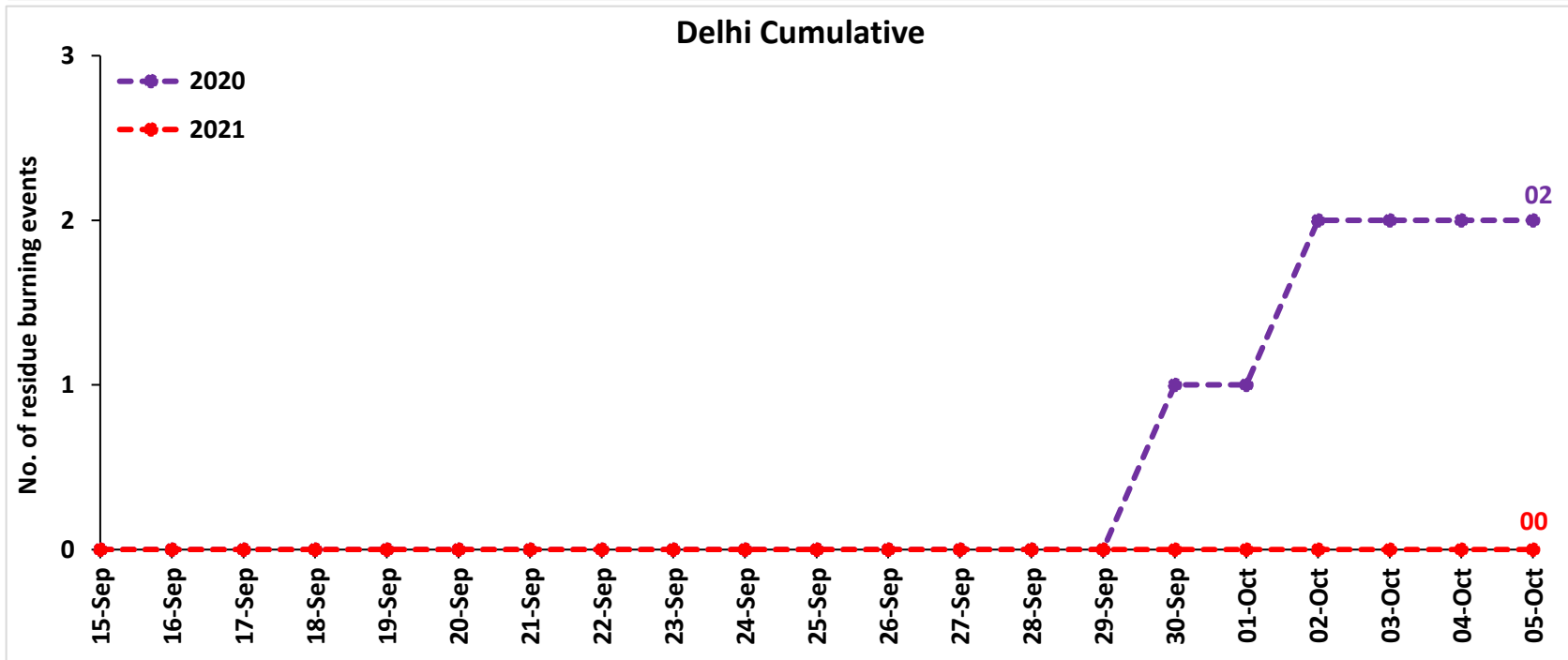
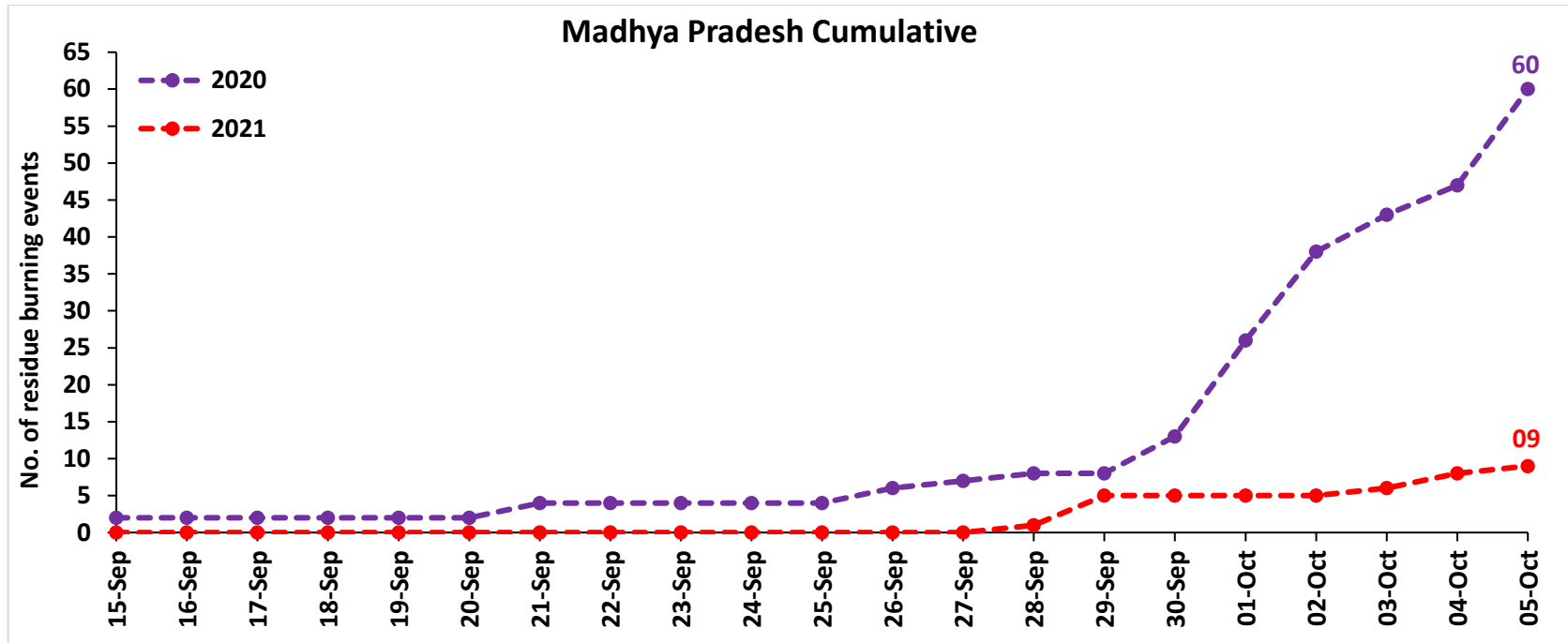




**Comparison of residue burning events in current year (2021) with previous year (2020) for the study States**

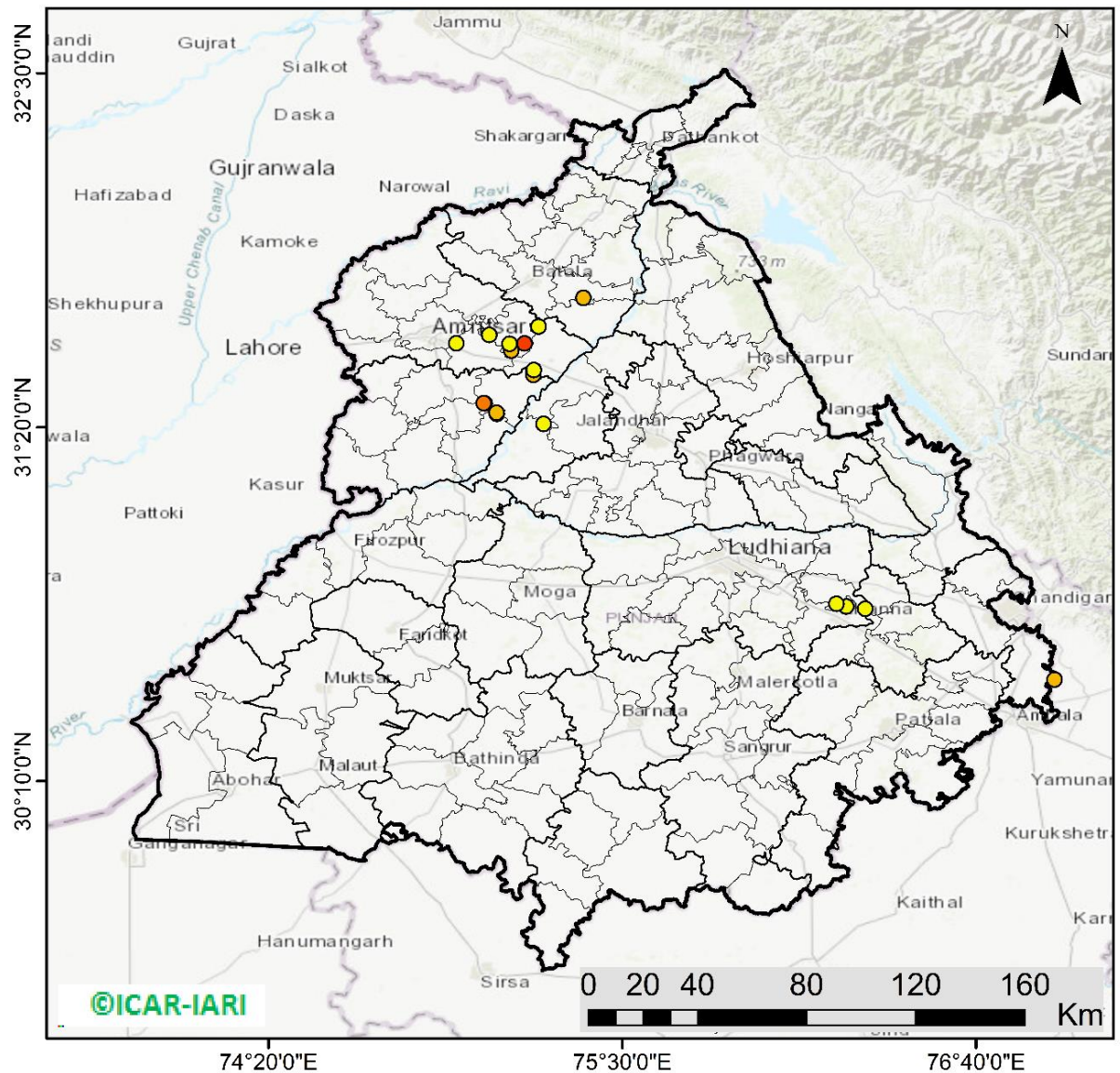






# Punjab

## RICE RESIDUE BURNING IN PUNJAB



**18** burning events detected in Punjab on **05th October 2021**

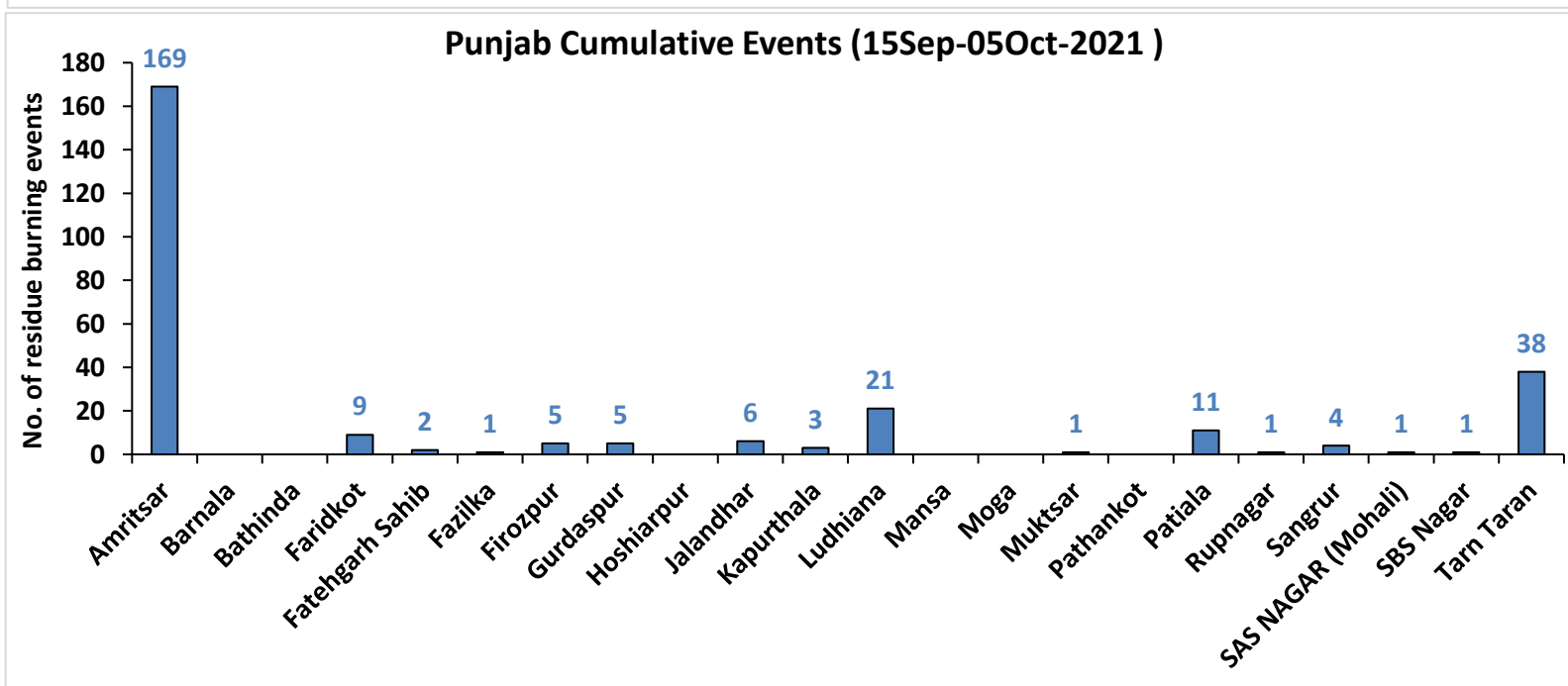
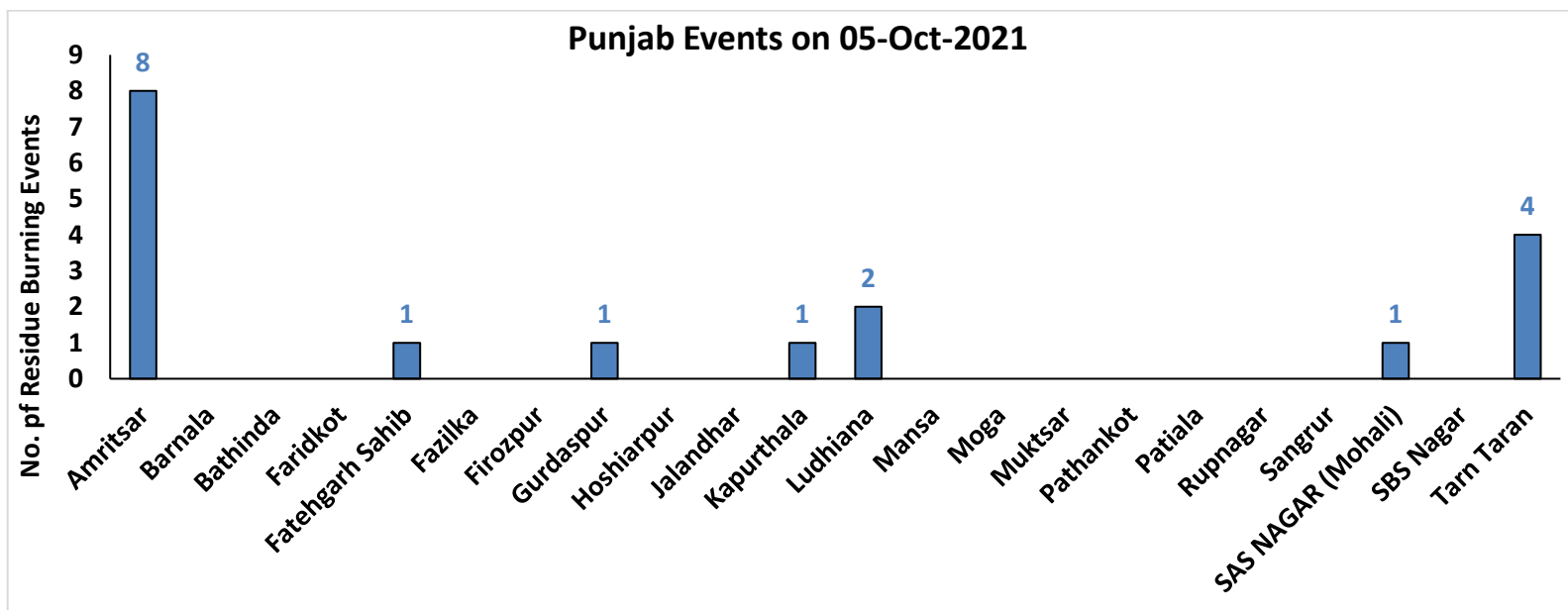
### Fire Intensity (W/m<sup>2</sup>)

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



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

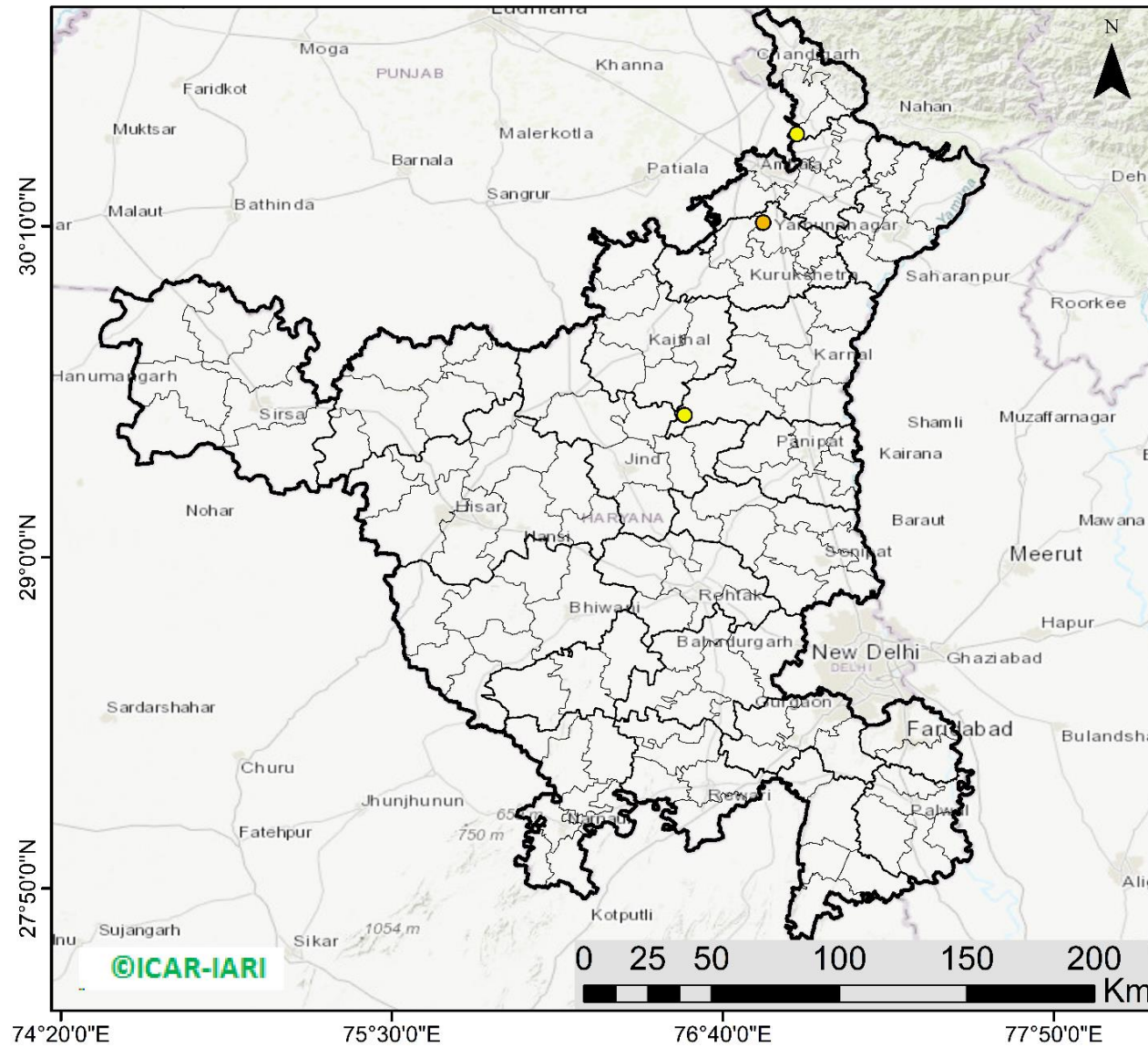
## District-wise cumulative number of residues burning events in Punjab (15Sep - 05Oct-2021)





# Haryana

## RICE RESIDUE BURNING IN HARYANA



**03** burning events detected in Haryana on **05th October 2021**

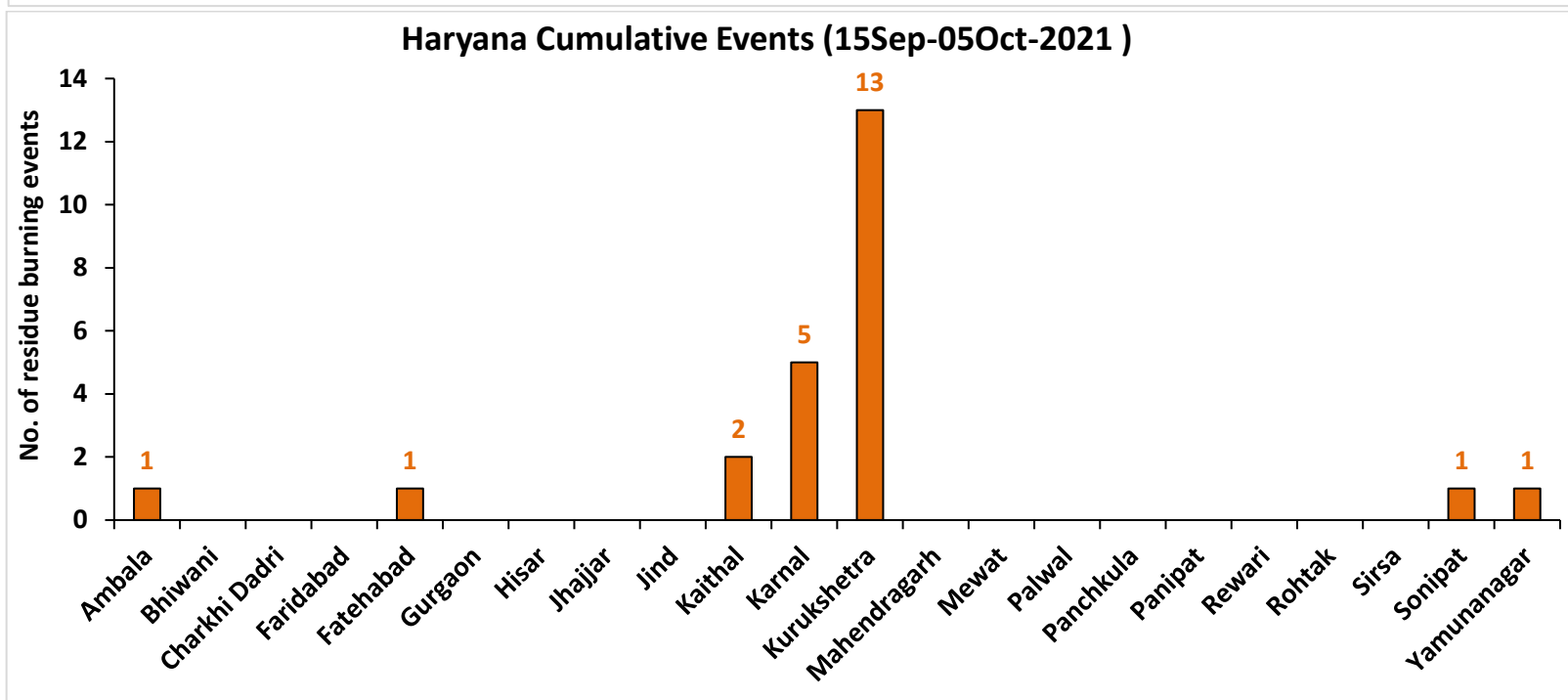
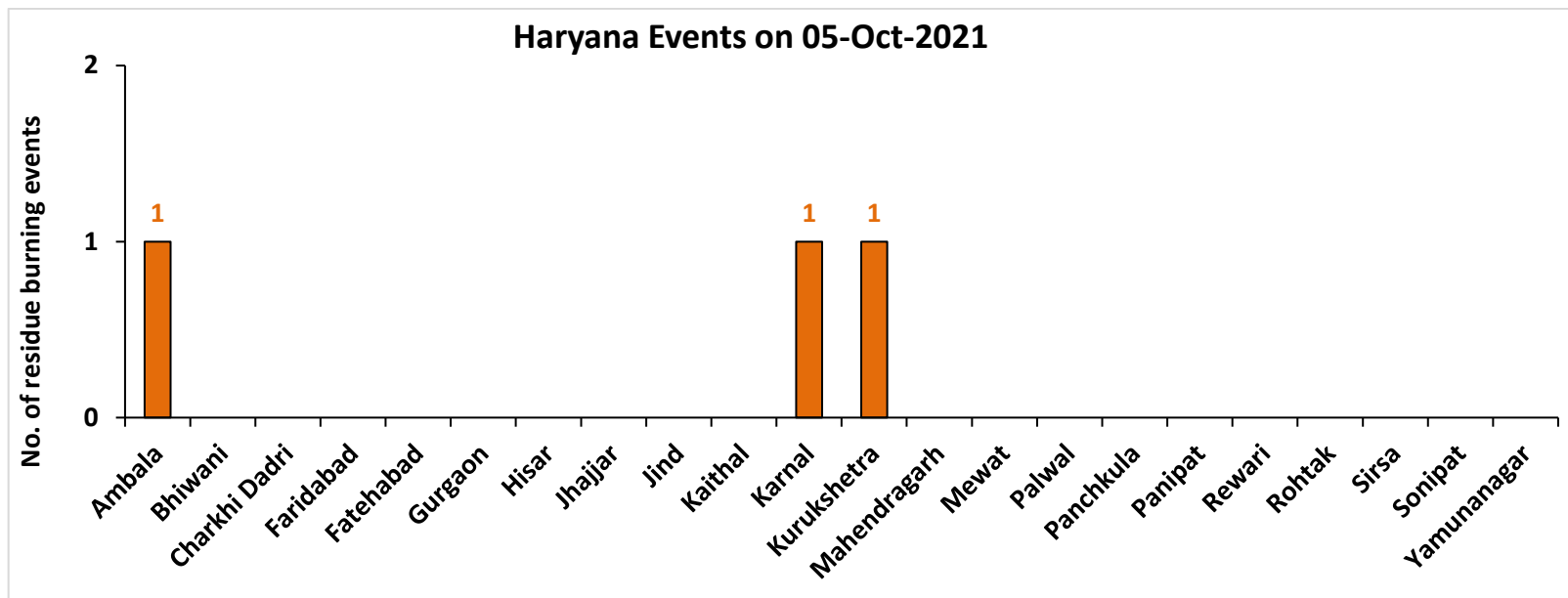
### Fire Intensity (W/m<sup>2</sup>)

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



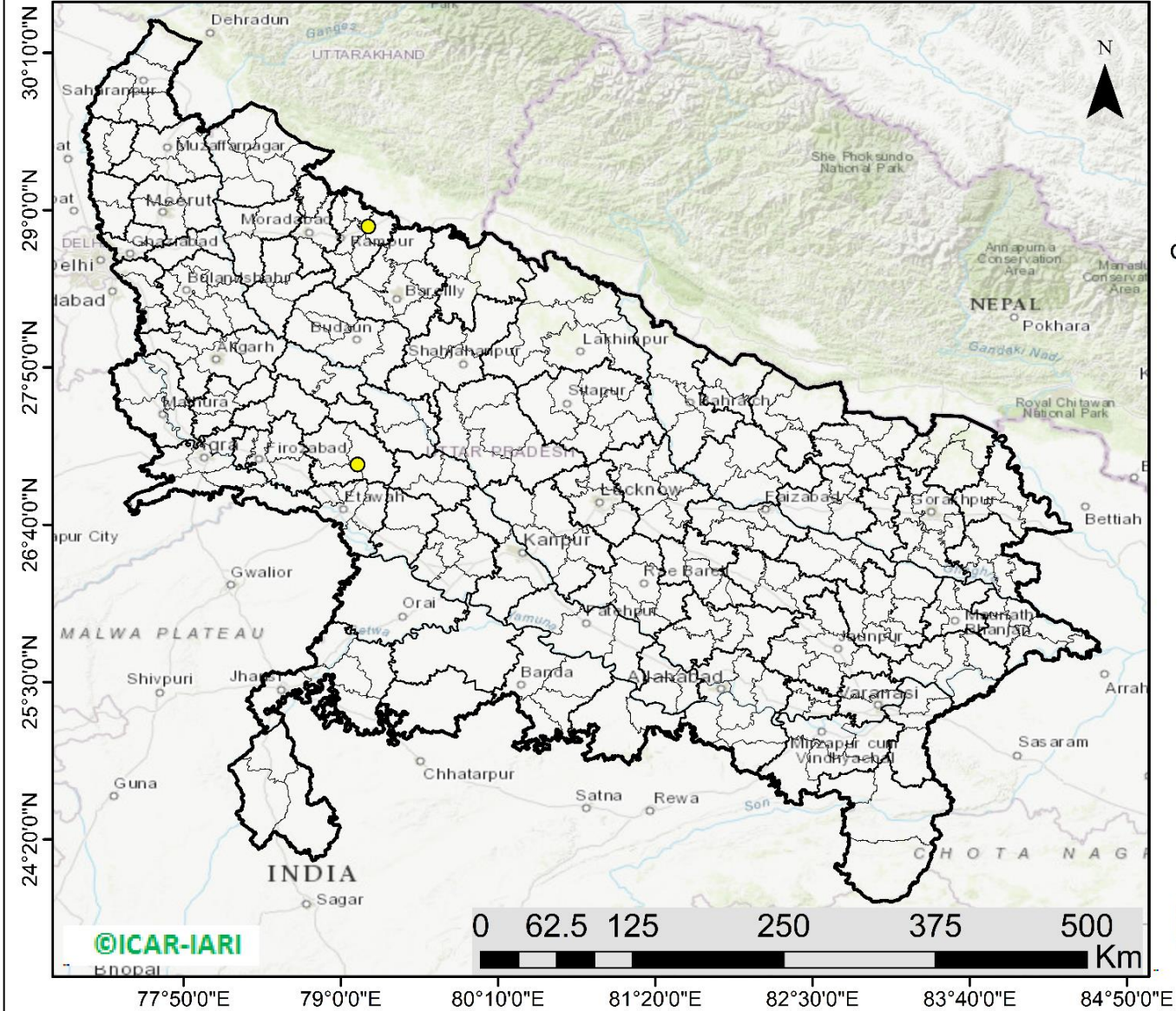
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

## District-wise cumulative number of residues burning events in Haryana (15 Sep - 05 Oct-2021)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



02 burning events detected in Uttar Pradesh on 05th October 2021

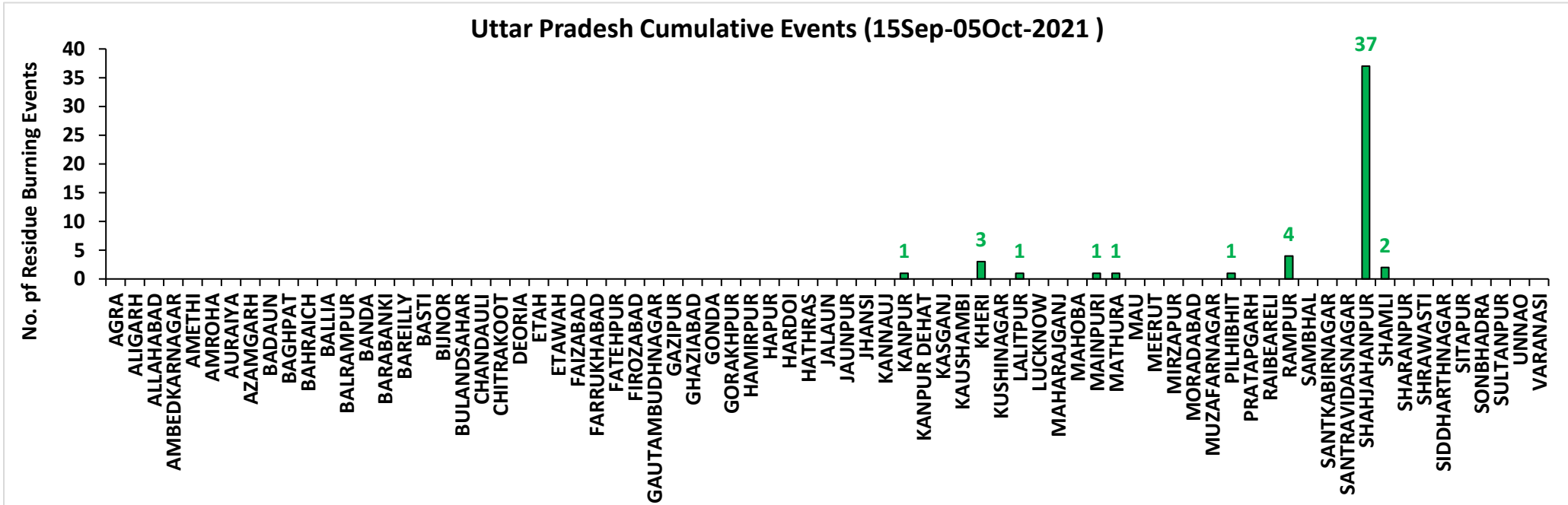
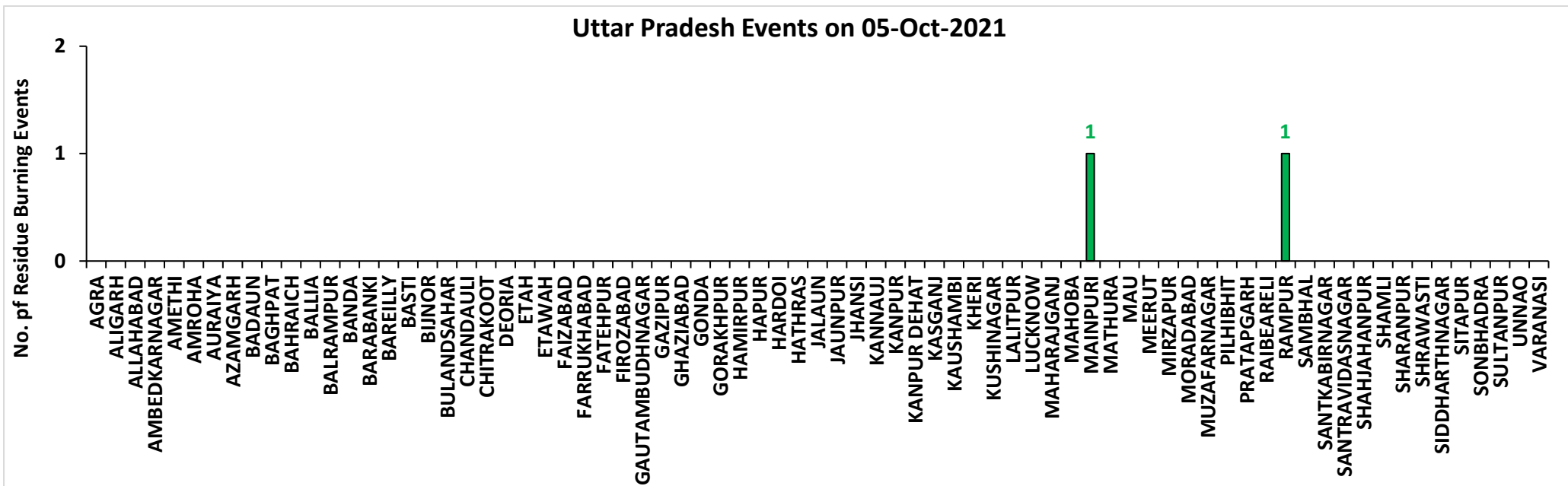
Fire Intensity (W/m2)

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



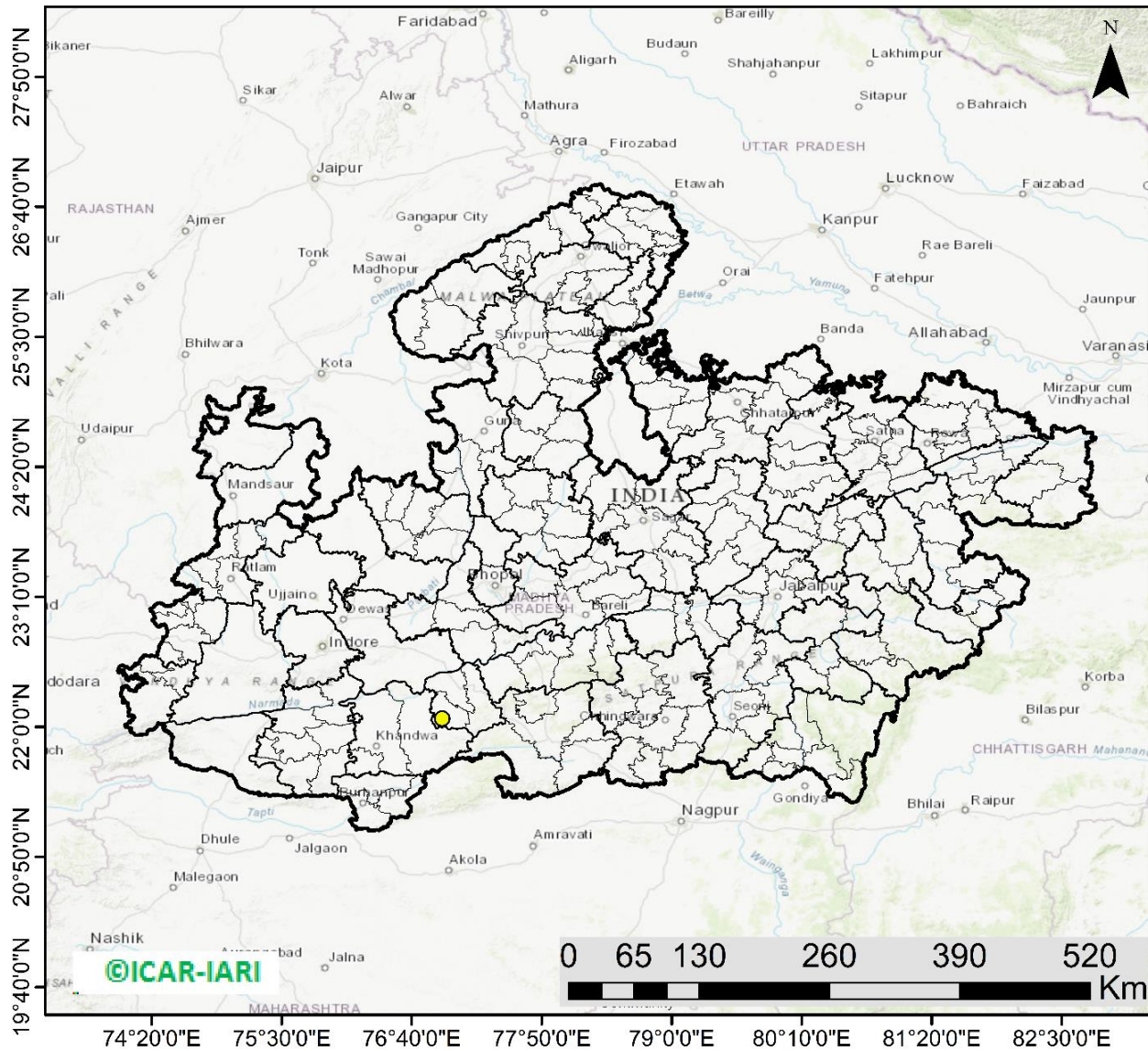
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

## District-wise cumulative number of residues burning events in Uttar Pradesh (15 Sep - 05 Oct-2021)



# Madhya Pradesh

## RICE RESIDUE BURNING IN MADHYA PRADESH



**01** burning events detected in MP on **05th October 2021**

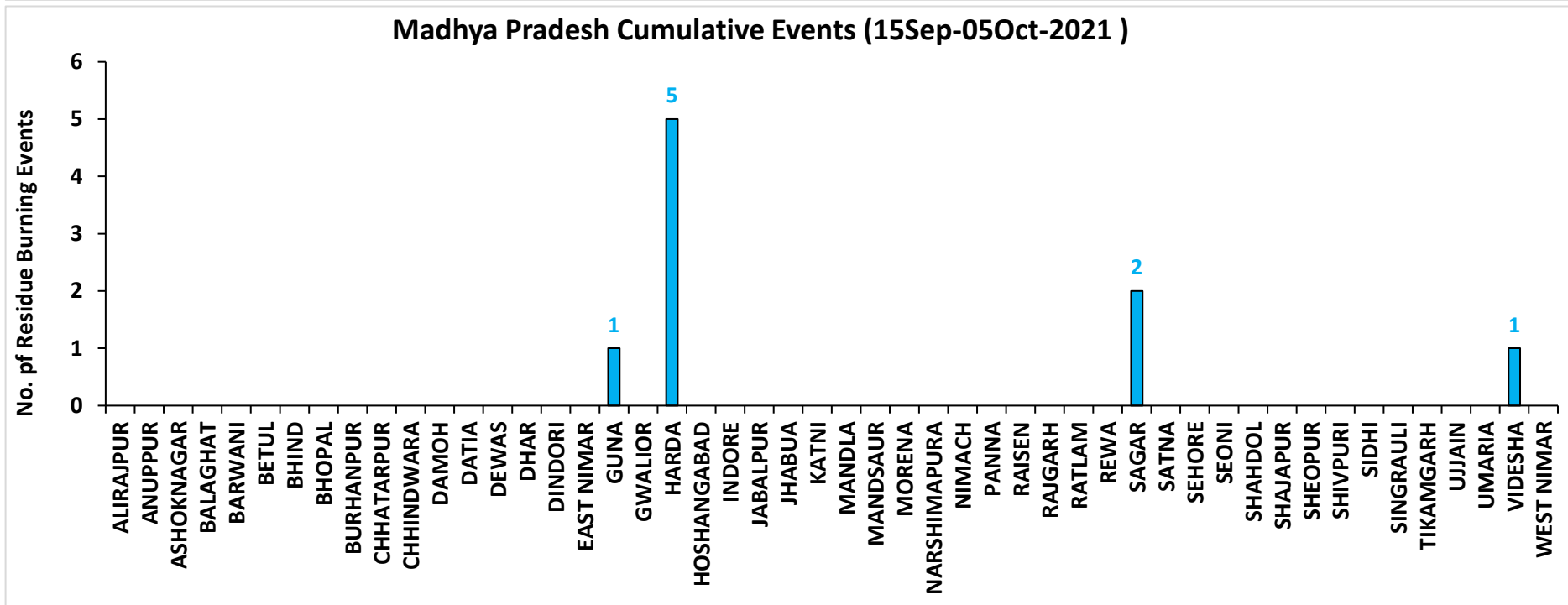
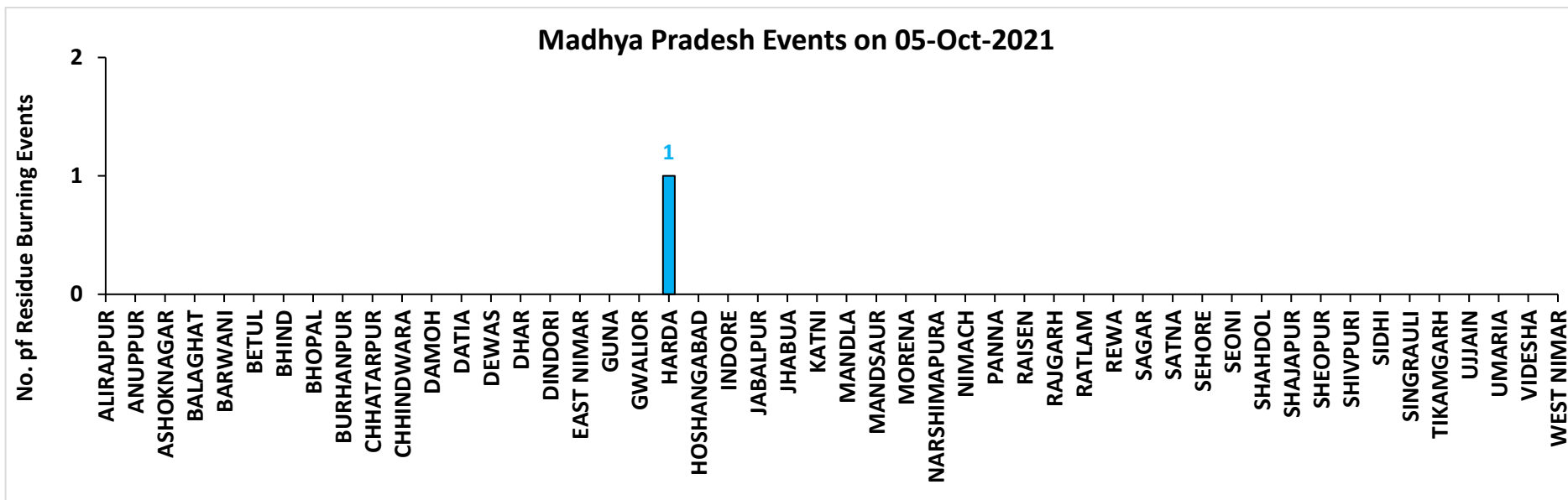
### Fire Intensity (W/m2)

- 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 (15 Sep - 05 Oct-2021)



**District-wise cumulative number of residues burning events detected in 2020 and 2021**  
**(Period: 15 September - 05 October)**

**(a) Punjab**

District	15 Sep – 05 Oct	
	2020	2021
AMRITSAR	1088	169
BARNALA	3	0
BATHINDA	0	0
FARIDKOT	4	9
FATEHGARH SAHIB	17	2
FAZILKA	0	1
FIROZPUR	30	5
GURDASPUR	70	5
HOSHIARPUR	3	0
JALANDHAR	14	6
KAPURTHALA	24	3
LUDHIANA	35	21
MANSA	2	0
MOGA	9	0
MUKTSAR	1	1
PATHANKOT	0	0
PATIALA	73	11
RUPNAGAR	1	1
SANGRUR	25	4
SAS NAGAR (MOHALI)	8	1
SBS NAGAR	2	1
TARN TARAN	355	38
<b>Total</b>	<b>1764</b>	<b>278</b>

**(b) Haryana**

District	15 Sep – 05 Oct	
	2020	2021
AMBALA	24	1
BHIWANI	0	0
CHARKHI DADRI	0	0
FARIDABAD	0	0
FATEHABAD	15	1
GURGAON	0	0
HISAR	3	0
JHAJJAR	0	0
JIND	2	0
KAITHAL	27	2
KARNAL	50	5
KURUKSHETRA	34	13
MAHENDRAGARH	0	0
MEWAT	0	0
PALWAL	1	0
PANCHKULA	0	0
PANIPAT	6	0
REWARI	0	0
ROHTAK	0	0
SIRSA	1	0
SONIPAT	4	1
YAMUNANAGAR	10	1
<b>Total</b>	<b>177</b>	<b>24</b>

(c) Uttar Pradesh

District	15 Sep – 05 Oct							
	2020	2021	GAUTAMBUDHNAGAR	1	0	MUZAFARNAGAR	2	0
AGRA	0	0	GAZIPUR	0	0	PILHIBHIT	3	1
ALIGARH	4	0	GHAZIABAD	1	0	PRATAPGARH	0	0
ALLAHABAD	0	0	GONDA	0	0	RAIBEARELI	1	0
AMBEDKARNAGAR	0	0	GORAKHPUR	0	0	RAMPUR	2	4
AMETHI	0	0	HAMIRPUR	0	0	SAMBHAL	5	0
AMROHA	0	0	HAPUR	2	0	SANTKABIRNAGAR	0	0
AURAIYA	11	0	HARDOI	0	0	SANTRAVIDASNAGAR	0	0
AZAMGARH	0	0	HATHRAS	0	0	SHAHJAHANPUR	6	37
BADAUN	0	0	JALAUN	0	0	SHAMLI	7	2
BAGHPAT	1	0	JAUNPUR	0	0	SHARANPUR	4	0
BAHRAICH	0	0	JHANSI	4	0	SHRAWASTI	0	0
BALLIA	0	0	KANNAUJ	1	0	SIDDHARTHANAGAR	0	0
BALRAMPUR	0	0	KANPUR	0	1	SITAPUR	3	0
BANDA	0	0	KANPUR DEHAT	1	0	SONBHADRA	0	0
BARABANKI	1	0	KASGANJ	1	0	SULTANPUR	0	0
BAREILLY	3	0	KAUSHAMBI	1	0	UNNAO	2	0
BASTI	0	0	KHERI	4	3	VARANASI	0	0
BIJNOR	1	0	KUSHINAGAR	0	0	<b>Total</b>	<b>89</b>	<b>51</b>
BULANDSAHAR	1	0	LALITPUR	0	1			
CHANDAULI	0	0	LUCKNOW	0	0			
CHITRAKOOT	0	0	MAHARAJGANJ	0	0			
DEORIA	0	0	MAHOBAB	0	0			
ETAH	3	0	MAINPURI	0	1			
ETAWAH	0	0	MATHURA	2	1			
FAIZABAD	0	0	MAU	0	0			
FARRUKHABAD	0	0	MEERUT	8	0			
FATEHPUR	1	0	MIRZAPUR	0	0			
FIROZABAD	1	0	MORADABAD	1	0			



**(d) Delhi**

District	15 Sep – 05 Oct	
	2020	2021
CENTRAL	0	0
EAST	0	0
NEW DELHI	0	0
NORTH	1	0
NORTH EAST	0	0
NORTH WEST DELHI	0	0
SHAHADRA	0	0
SOUTH	1	0
SOUTH EAST	0	0
SOUTH WEST DELHI	0	0
WEST DELHI	0	0
<b>Total</b>	<b>2</b>	<b>0</b>

**(e) Rajasthan**

District	15 Sep – 05 Oct	
	2020	2021
AJMER	0	0
ALWAR	1	0
BANSWARA	0	0
BARAN	30	0
BARMER	2	0
BHARATPUR	0	0
BHILWARA	1	0
BIKANER	0	0
BUNDI	1	0
CHITTAURGARH	0	1
CHURU	0	0
DAUSA	0	0
DHOLPUR	0	0
DUNGARPUR	0	0
GANGANAGAR	1	0
HANUMANGARH	9	0
JAIPUR	0	0
JAISELMER	1	0
JALOR	0	0
JHALAWAR	0	0
JHUNJHUNUN	1	0
JODHPUR	1	0
KARAULI	1	0
KOTA	7	0
NAGPUR	0	0
PALI	1	0
PRATAPGARH	0	0
RAJSMAND	0	0
SIKAR	0	0
SIROHI	0	0
SWAIMADHOPUR	0	0
TONK	1	0
UDAIPUR	0	0
<b>Total</b>	<b>58</b>	<b>1</b>

(f) Madhya Pradesh

District	15 Sep – 05 Oct				
	2020	2021			
			PANNA	0	0
ALIRAJPUR	0	0	RAISEN	0	0
ANUPPUR	0	0	RAJGARH	1	0
ASHOKNAGAR	5	0	RATLAM	0	0
BALAGHAT	0	0	REWA	0	0
BARWANI	0	0	SAGAR	2	2
BETUL	0	0	SATNA	2	0
BHIND	0	0	SEHORE	1	0
BHOPAL	1	0	SEONI	0	0
BURHANPUR	0	0	SHAHDOL	0	0
CHHATARPUR	1	0	SHAJAPUR	3	0
CHHINDWARA	0	0	SHEOPUR	0	0
DAMOH	5	0	SHIVPURI	0	0
DATIA	1	0	SIDHI	0	0
DEWAS	0	0	SINGRAULI	0	0
DHAR	6	0	TIKAMGARH	0	0
DINDORI	0	0	UJJAIN	3	0
EAST NIMAR	0	0	UMARIA	0	0
GUNA	5	1	VIDESHA	11	1
GWALIOR	4	0	WEST NIMAR	0	0
HARDA	6	5	<b>Total</b>	<b>60</b>	<b>9</b>
HOSHANGABAD	0	0			
INDORE	1	0			
JABALPUR	1	0			
JHABUA	0	0			
KATNI	0	0			
MANDLA	0	0			
MANDSAUR	0	0			
MORENA	1	0			
NARSHIMAPURA	0	0			
NIMACH	0	0			

**State-wise and date-wise number of paddy residue burning events detected in 2020 and 2021**

**(Period: 15 September - 05 October)**

<b>Number of Paddy Residue Burning Events Detected</b>												
	<b>Punjab</b>		<b>Haryana</b>		<b>Uttar Pradesh</b>		<b>Delhi</b>		<b>Rajasthan</b>		<b>Madhya Pradesh</b>	
	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>
<b>15-Sep</b>	5	0	2	0	1	0	0	0	1	0	2	0
<b>16-Sep</b>	0	2	1	0	0	0	0	0	0	0	0	0
<b>17-Sep</b>	5	0	3	0	0	0	0	0	0	0	0	0
<b>18-Sep</b>	17	9	0	0	0	1	0	0	0	0	0	0
<b>19-Sep</b>	30	5	2	0	0	1	0	0	0	0	0	0
<b>20-Sep</b>	67	8	6	0	2	0	0	0	0	0	0	0
<b>21-Sep</b>	54	0	2	0	1	0	0	0	1	0	2	0
<b>22-Sep</b>	34	0	1	0	1	0	0	0	0	0	0	0
<b>23-Sep</b>	49	0	0	0	1	0	0	0	1	0	0	0
<b>24-Sep</b>	78	5	0	0	1	1	0	0	0	0	0	0
<b>25-Sep</b>	184	11	11	0	5	0	0	0	1	0	0	0
<b>26-Sep</b>	190	19	5	0	8	0	0	0	1	0	2	0
<b>27-Sep</b>	78	37	8	0	4	1	0	0	0	0	1	0
<b>28-Sep</b>	55	28	6	1	1	6	0	0	0	0	1	1
<b>29-Sep</b>	63	64	9	4	6	10	0	0	3	0	0	4
<b>30-Sep</b>	116	27	22	2	13	13	1	0	1	0	5	0
<b>01-Oct</b>	165	13	15	4	7	13	0	0	4	1	13	0
<b>02-Oct</b>	141	0	30	2	12	0	1	0	7	0	12	0
<b>03-Oct</b>	110	9	8	6	4	3	0	0	9	0	5	1
<b>04-Oct</b>	162	23	29	2	8	0	0	0	15	0	4	2
<b>05-Oct</b>	161	18	17	3	14	2	0	0	14	0	13	1
<b>Total</b>	<b>1764</b>	<b>278</b>	<b>177</b>	<b>24</b>	<b>89</b>	<b>51</b>	<b>2</b>	<b>0</b>	<b>58</b>	<b>1</b>	<b>60</b>	<b>9</b>

### Details of residue burning events in Punjab on 05-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	AMRITSAR	JANDIALA GURU	S-NPP	31.60980	74.95260	10/5/2021	13:10:24	D	4.90
2	AMRITSAR	RAYYA	S-NPP	31.50540	75.20700	10/5/2021	13:10:24	D	7.70
3	AMRITSAR	RAYYA	S-NPP	31.52130	75.20840	10/5/2021	13:10:24	D	4.20
4	AMRITSAR	TARSIKKA	S-NPP	31.58540	75.13370	10/5/2021	13:10:24	D	5.70
5	AMRITSAR	TARSIKKA	S-NPP	31.60780	75.12790	10/5/2021	13:10:24	D	3.80
6	AMRITSAR	TARSIKKA	S-NPP	31.60940	75.17760	10/5/2021	13:10:24	D	19.60
7	AMRITSAR	TARSIKKA	S-NPP	31.63740	75.06140	10/5/2021	13:10:24	D	4.00
8	AMRITSAR	TARSIKKA	S-NPP	31.66500	75.22400	10/5/2021	13:10:24	D	4.20
9	FATEHGARH SAHIB	KHAMANON	S-NPP	30.73460	76.30150	10/5/2021	13:10:24	D	2.70
10	GURDASPUR	QADIAN	S-NPP	31.75930	75.37190	10/5/2021	13:10:24	D	6.10
11	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.34390	75.24010	10/5/2021	13:10:24	D	4.90
12	LUDHIANA	KHANNA	S-NPP	30.74200	76.23900	10/5/2021	13:10:24	D	4.40
13	LUDHIANA	SAMRALA	S-NPP	30.75110	76.20630	10/5/2021	13:10:24	D	4.20
14	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.50100	76.92580	10/5/2021	13:10:24	D	5.60
15	TARN TARAN	CHOHLA SAHIB	S-NPP	31.37710	75.08620	10/5/2021	13:10:24	D	6.00
16	TARN TARAN	CHOHLA SAHIB	S-NPP	31.38090	75.08520	10/5/2021	13:10:24	D	6.80
17	TARN TARAN	NAUSHERA PANNUAN	S-NPP	31.41150	75.04640	10/5/2021	13:10:24	D	10.90
18	TARN TARAN	NAUSHERA PANNUAN	S-NPP	31.41230	75.04310	10/5/2021	13:10:24	D	13.00

### Details of residue burning events in Haryana on 05-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMBALA	SHAHZADPUR	S-NPP	30.49050	76.92830	10/5/2021	13:10:24	D	5.00
2	KARNAL	ASSANDH	S-NPP	29.50070	76.53220	10/5/2021	13:10:24	D	3.60
3	KURUKSHETRA	SHAHBAD	S-NPP	30.17900	76.80950	10/5/2021	13:10:24	D	6.10

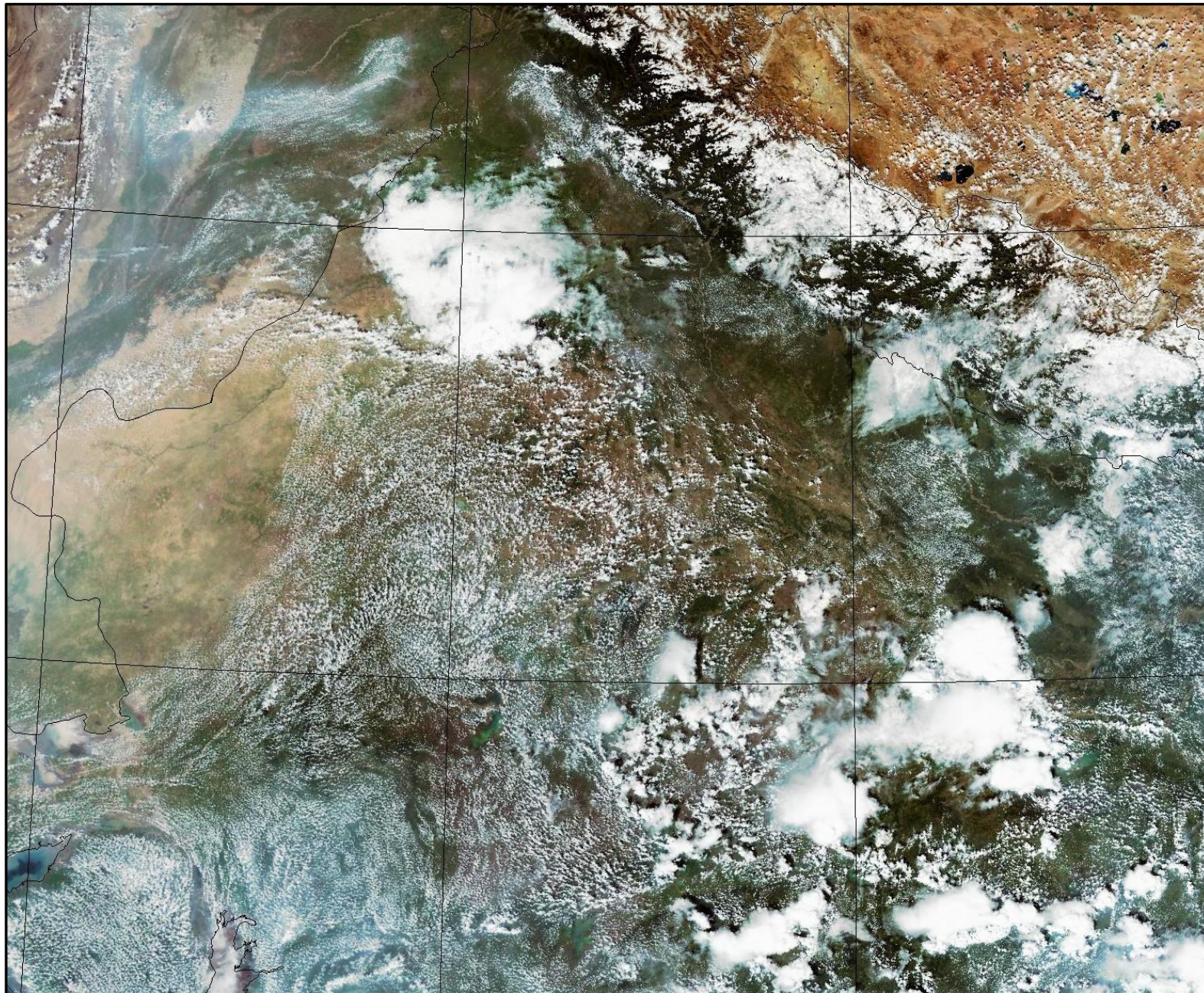
### Details of residue burning events in Uttar Pradesh on 05-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	MAINPURI	BHOGAON	S-NPP	27.11250	79.12370	10/5/2021	13:10:24	D	2.10
2	RAMPUR	BILASPUR	S-NPP	28.87780	79.20420	10/5/2021	13:10:24	D	2.60

### Details of residue burning events in Madhya Pradesh on 05-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	HARDA	KHIRKIYAN	S-NPP	22.07360	76.94080	10/5/2021	13:10:24	D	1.90

SNPP (VIIRS) Satellite image (TCC) of North and Central India Acquired on 05-Oct-2021 at 13:07:20 IST by IARI Ground Station



**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**

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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)

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