Preliminary Report
National Remote Sensing Centre (ISRO), Hyderabad
Disaster Support Centre, Disaster Management Support Programme

Satellite Remote Sensing Based Forest Fire Monitoring of SariskaTiger Reserve, Rajasthan

Fire Event

The present activity is taken up to monitor forest fire that started in Sariska tiger reserve. The fire activity was observed to have started on 27th March 2022 and subsided by 30th March 2022.

BHUVAN Dissemination

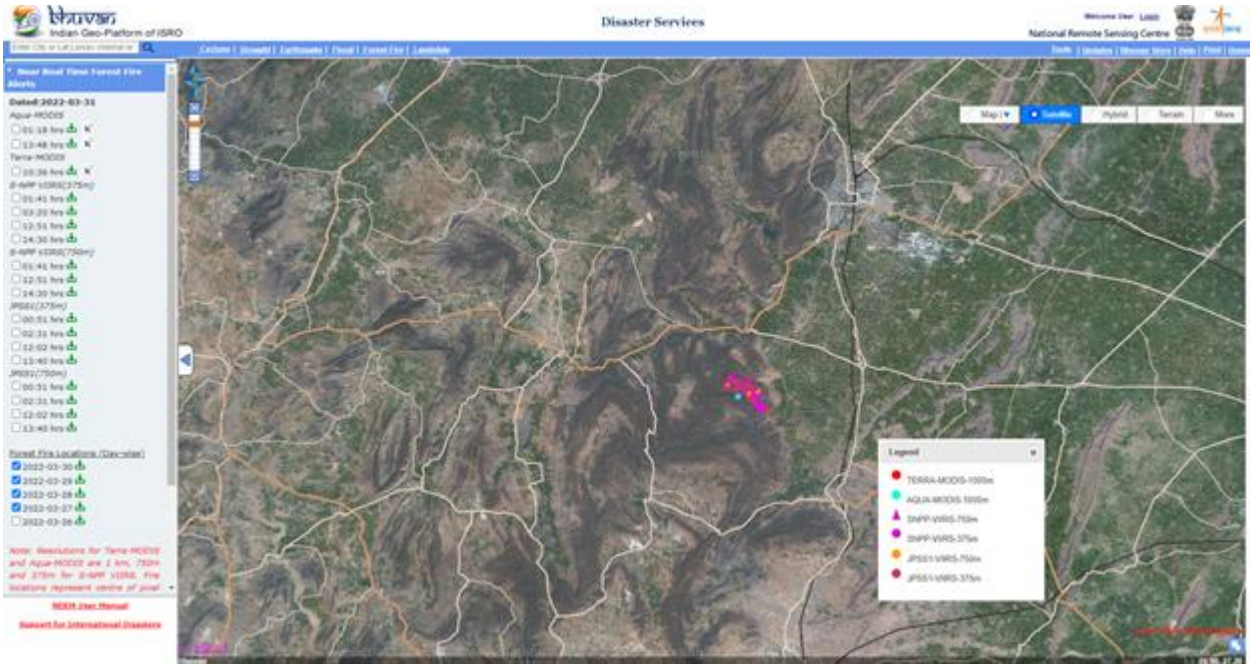
The near real time forest fire alerts are generated within 30 minutes of the satellite pass (day & night from MODIS, S-NPP and JPSS) collected over India and sent to FSI, Dehradun. These forest fire alerts are also disseminated using ISRO geo-visualization portal –Bhuvan.

Direct link: https://bhuvan-app1.nrsc.gov.in/disaster/disaster.php?id=fire

The number of active forest fire locations per sensor since 27th March 2022is given in the table below.

DATE	Terra	Aqua	NOAA-20	SNPP	Total
	MODIS	MODIS	VIIRS	VIIRS	
27-Mar-2022			2	2	4
28-Mar-2022		2	12	19	33
29-Mar-2022			4	9	13
30-Mar-2022		1		1	2
Grand Total		3	18	31	52

The desired fire event snapshot (Bhuvan dissemination) from 27th till 30thMar2022 is as follows.



Web-publishing of active fire alerts through Bhuvan

Optical data set from IRS AWiFS of 28th March 2022) and Sentinel-2B of 30th March 2022was analyzed to map fire affected area. Following figures show false coloured composites (FCC in SWIR, NIR, Red) of IRS AWiFS and Sentinel-2B of the study area overlaid with fire affected area extent. Fire affected area can be seen in purple colouredsignature in the images. A total of 1 sq.km was estimated to have burned using IRS AWiFS data as on 28th March 2022 using hybrid methods. A total of 11.3 sq.km was estimated to have burned using Sentinel-2B data of 30th March 2022 using machine learning algorithm.

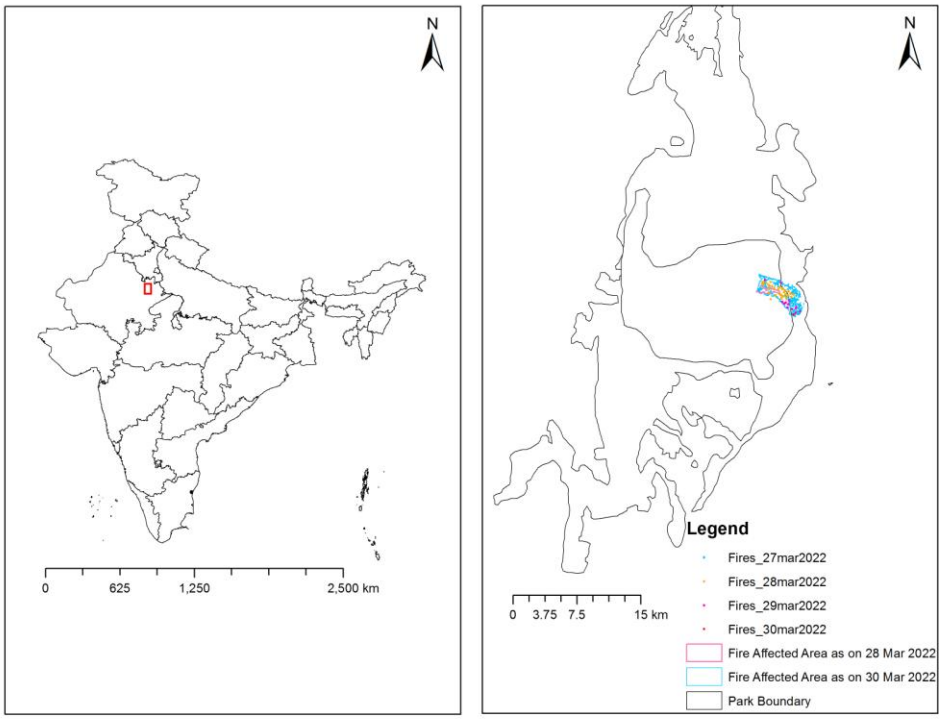


Figure showing active fires and burned area extent during the fire event .

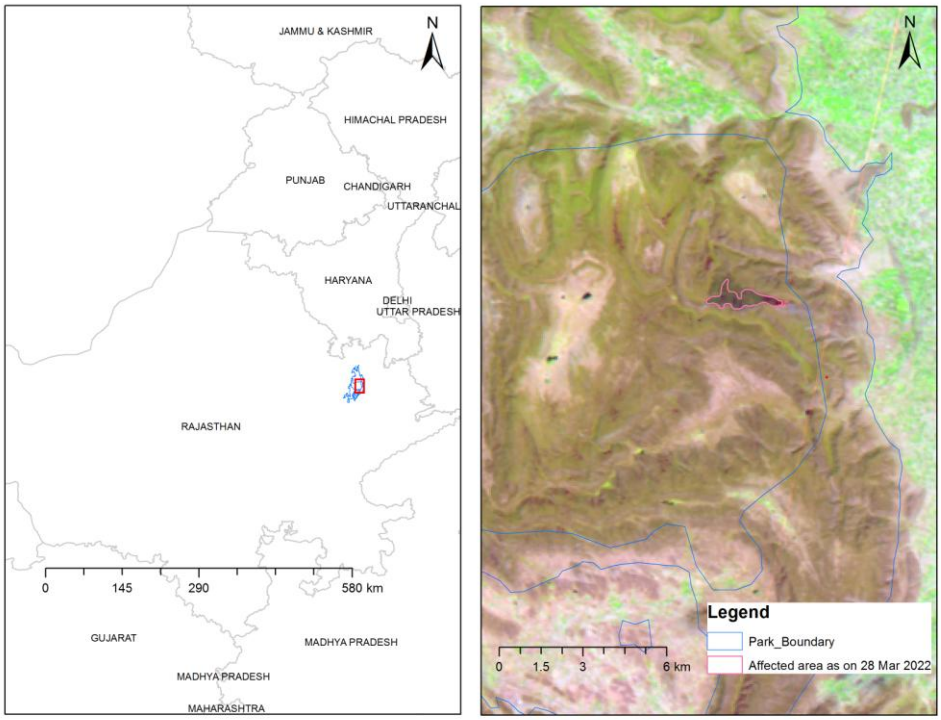


Figure showing IRS AWiFS FCC of 28-Mar-2022 with fire scars as dark purple patches overlaid with fire affected area extent.

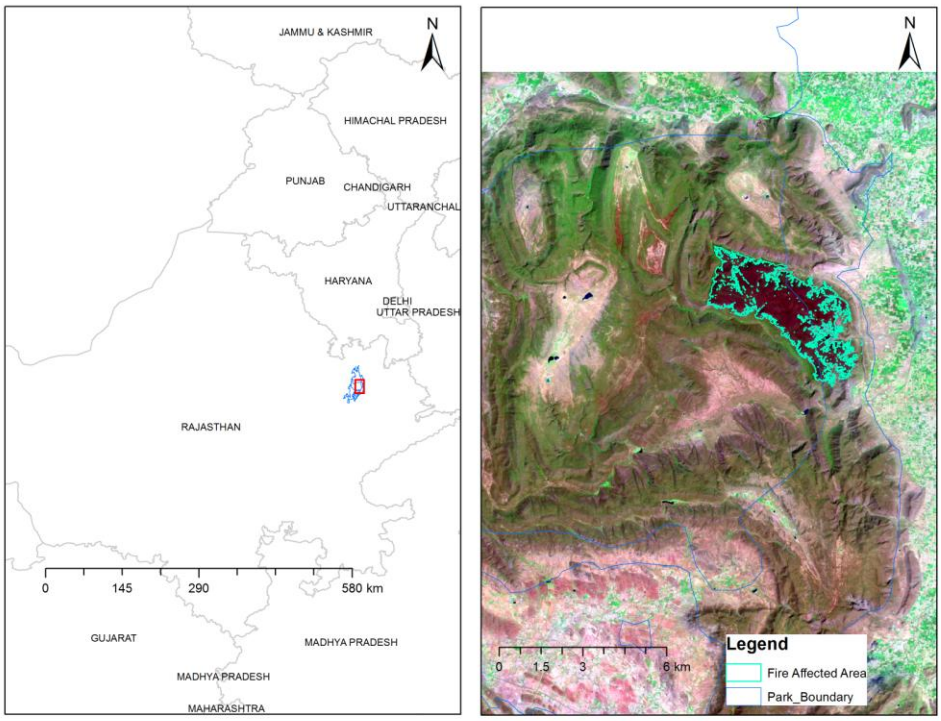


Figure showing Sentinel-2B FCC of 30-Mar-2022 with fire scars as dark purple patches overlaid with fire affected area extent.

Background on ISRO's Disaster Management Support Programme and INFFRAS:

Active forest fire monitoring using satellite data has been taken up as a major objective under the “Indian Forest Fire Response and Assessment System (INFFRAS)”. INFFRAS was set up as part of the Disaster Management Support Program of ISRO, under the Decision Support Centre (DSC), National Remote Sensing Centre (NRSC). The activity is to be carried out every year to cater the needs for the state forest departments across India for forest fire mitigation and management activities. Temporal data on active fires generated as part of the project is useful for current and future studies associated with ecological impacts, damage assessment and climate change.

The National Forest Policy (1988) emphasizes the adoption of improved and modern management practices to deal with forest fires. The Disaster Management Act (2005) recognizes forest fires as a disaster.

Objectives - INFFRAS

Major objectives of INFFRAS include

1. Daily Near real time active fire alerts generation using day/night satellite observations (viz., MODIS, Suomi-NPP, JPSS).
2. Value additions to the active fire alerts in terms of forest masking and map production with forest administrative boundaries
3. Dissemination of the active fire information to the user departments for further action by email, through DSC website and ISRO geo-visualization - BHUVAN.
4. Rapid (during-fire season) and total (post-fire season) burnt area assessment based on user request.