

भारत सरकार  
अन्तरिक्ष विभाग  
राष्ट्रीय सुदूर संवेदन केन्द्र  
बालानगर, हैदराबाद-500 625, आं.प्र. भारत  
टेलिफोन : +040-23879572-76  
+040-23879261-65  
फैक्स : +040-23878648



Government of India  
Department of Space  
**National Remote Sensing Centre**  
Balanagar, Hyderabad-500 625, AP, India  
Telephone : +040-23879572-76  
+040-23879261-65  
Fax : +040-23878648

**Dr. A V Suresh Babu**

Head, Flood Mapping & Risk Assessment Division  
Disaster Management Support Group

Phone: 040-23884544,  
e-mail: sureshbabu\_av@nrsc.gov.in

Date: May 24, 2022

No: 01-FL-2022-ASSAM/10

Dear Sir,

Sub: Assam Heavy Rains 2022- Near Real Time Flood Mapping using satellite data

Please refer to our earlier mail dated 23<sup>rd</sup> May 2022 regarding Near Real Time Flood Inundation Mapping project using satellite data. So far we have sent 9 flood maps covering floods in part of Assam State. Heavy incessant rains in many regions of Assam during the third week of May 2022 has led to flash floods in Assam State. We have analysed Sentinel-1A SAR satellite data of 23<sup>rd</sup> May 2022 (1800 Hrs IST) and an inundation map for part of Assam State is prepared. The map along with a brief report is enclosed herewith for your kind information. **Since the image was acquired during/immediate to the rainfall event, large extents of wet areas were also observed.**

Further, we request you to visit flood page in Bhuvan portal (<https://bhuvan-app1.nrsc.gov.in/disaster/disaster.php?Id=flood>) NDEM portal (<https://ndem.nrsc.gov.in>) for better visualization of flood extent in Assam State.

In addition, the flood layer in GIS ready format and inundation statistics are transmitted to Assam State Remote Sensing Application Centre and North Eastern State Application Centre by e-mail for further value addition and dissemination to user departments.

We will continue to keep a watch on the flood situation and update the information as and when required. Your support and active interaction is highly appreciated. Please provide feedback on the information being provided.

With kind regards

Yours sincerely,  
**(A V SURESH BABU)**

**As per the distribution list enclosed in the report.**

# Assam Heavy Rains – 2022

## 1.0 Background

Floods were reported in Assam due to heavy rains followed by rise in water levels of Brahmaputra & its tributaries during the third week of May, 2022. According to ASDMA, Govt. of Assam, Dima Hasao is the worst affected district in current spell followed by Nagaon, Hojai and Barak valley districts. According to Central Water Commission, River Kopili at Kampur in Nagaon district, is reported to be flowing in extreme flood situation. Many other tributaries of Brahmaputra river are flowing in severe flood situation (Source: CWC, News media)

## 2.0 Satellite Data

Flood Disaster Team is keeping a constant watch on the flood situation and checked the satellite data coverage over the affected areas Sentinel-1A SAR satellite data of 23<sup>rd</sup> May 2022 (1800 Hrs IST) is acquired & analysed. (Refer Table-1).

**Table-1 Satellite Data acquired over Flood Affected Area**

S No	Date	Satellite / Sensor	Status
1	18-05-2022 (1800 Hrs)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
2	19-05-2022	Indian EO	Analysed and 1 flood map was sent.
3	19-05-2022 (1800 Hrs IST)	RADARSAT-2 SAR	Analysed and 1 flood map was sent.
4	19-05-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
5	19-05-2022 (1000 Hrs IST)	NOVA SAR	Analysed and 1 flood map was sent.
6	20-05-2022 (1000 Hrs IST)	NOVASAR & IRS SAR	Analysed and 1 flood map was sent.
7	21-05-2022 (0600 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
8	22-05-2022 (0600 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
9	22-05-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
10	23-05-2022 (1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map is being sent.

### 3.0 Data Analysis

Satellite data is rectified and flood inundation layer is extracted. Further, flood inundation map was composed for part of Assam state based on the analysis Sentinel-1A SAR satellite data of 23<sup>rd</sup> May 2022 (1800 Hrs IST). The flood inundation layer is integrated with district boundary layer, for extracting district-wise flood inundation statistics which are shown in the Table-2.

### 4.0 Observations

Based on the analysis of satellite data, the following points were observed.

- Satellite data covers part of Assam State
- Major inundation was observed in Cachar, Nagaon, Marigaon, Karimganj & Hojai districts.
- The inundation is observed to have receded in many districts when compared to May 22, 2022 (1800 hrs)
- The Inundation may include water accumulation in low lying areas due to heavy incessant rainfall.

**Table-2:**

S. No.	DISTRICT	Inundated Area (in ha)
1	CACHAR	31989
2	NAGAON	30417
3	MORIGAON	15072
4	KARIMGANJ	12617
5	HOJAI	9750
6	DARRANG	7481
7	HAILAKANDI	6376
8	KAMRUP_RURAL	6362
9	BARPETA	5389
10	KAMRUP_METRO	1729
11	WEST_KARBI_ANGLONG	1651
12	SONITPUR	1634
13	GOALPARA*	670
14	BISWANATH*	665
15	NALBARI	640
16	BAJALI	127
	<b>Total</b>	<b>132571</b>

**Note:**

- Flood inundation may include rain water accumulation / flood water in low lying areas.
- Districts with inundation less than 100 ha are not included in the statistics
- \* Partially covered in satellite data.

**Distribution List:**

1	MHA	<ol style="list-style-type: none"><li>1. Joint Secretary, NDM, Ministry of Home Affairs, North Block, New Delhi - 110 001. (Through e-mail).</li><li>2. NDM control Room, Ministry of Home Affairs, North Block, New Delhi - 110 001 (Through e-mail).</li><li>3. DG, NDRF, New Delhi</li></ol>
2	NODAL MINISTRIES	<ol style="list-style-type: none"><li>1. Director, FCA, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi-110066</li><li>2. Deputy Director General, Hydrology, India Meteorological Department, Mausam Bhavan, New Delhi -110003</li></ol>
3	STATE	<ol style="list-style-type: none"><li>1. Additional Chief Secretary &amp; Relief Commissioner, Govt. of Assam, Janatha Bhavan, Assam Secretariat, Dispur, GUWAHATI-781005. (Hard copy of the map through NESAC/ARSAC also).</li><li>2. Scientific Officer, Assam State Remote Sensing Application Centre (ARSAC) Govt of Assam, Guwahati, Assam Fax: 0361-452455 (with a request to disseminate the information to the concerned user depts.)</li></ol>
4	ISRO/DOS	<ol style="list-style-type: none"><li>1. Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail)</li><li>2. Programme Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail)</li><li>3. Associate Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail)</li></ol>
5	NRSC	<ol style="list-style-type: none"><li>1. Group Head, DMSG, NRSC</li><li>2. Deputy Director (RSA) &amp; Project Director, RRES</li><li>3. Associate Director, NRSC</li><li>4. Director, NRSC</li></ol>

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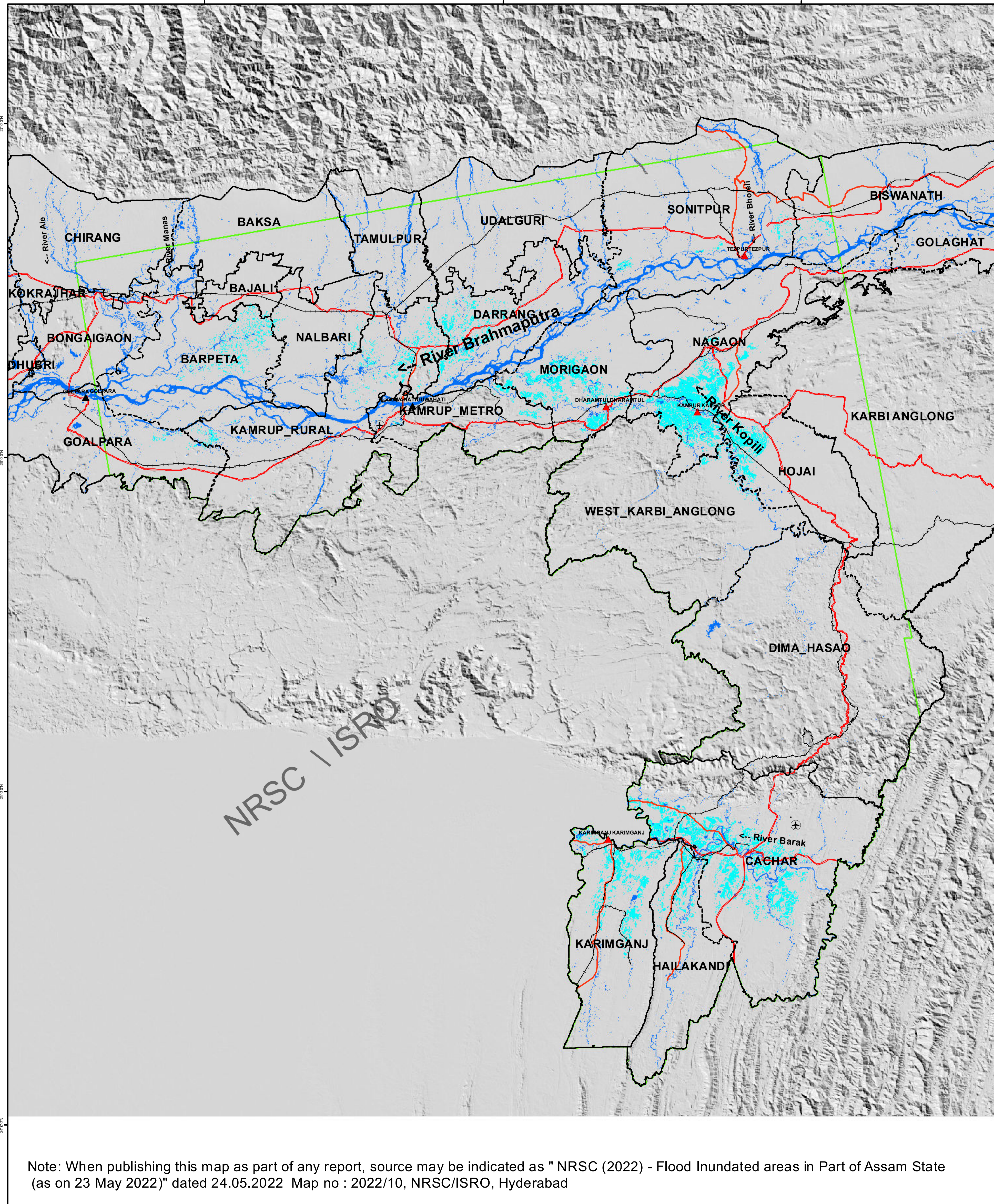
# Flood Inundated Areas in Part of Assam State

Based on the analysis of Sentinel-1A SAR satellite data of 23-May-2022 (1800 Hrs)

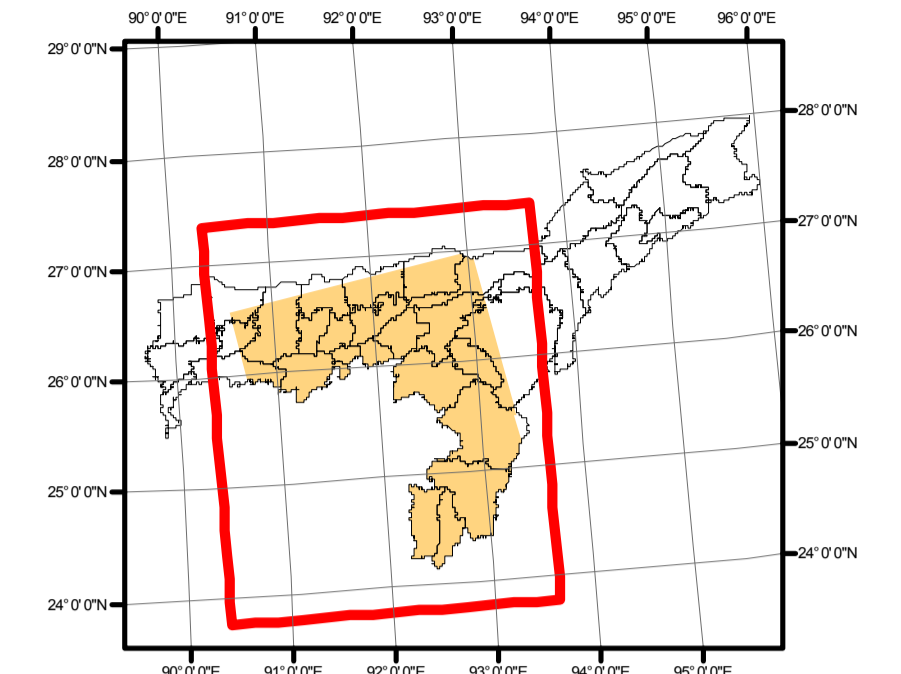
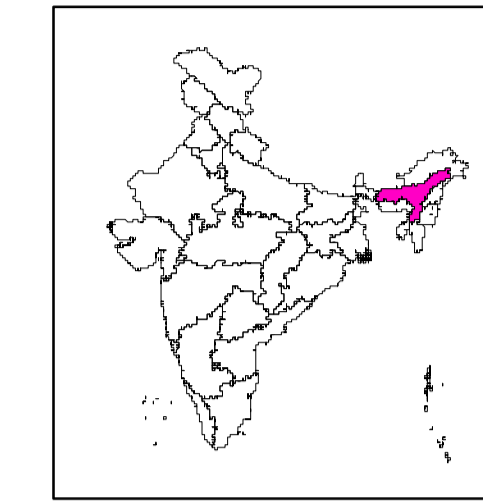
For official use

DISASTER EVENT ID: 01-FL-2022-ASSAM  
MAP ID: 2022/10

Date of Issue : 24.05.2022



## Location Map



## About the Event

Floods were reported in Assam due to heavy rains followed by rise in water levels of Brahmaputra & its tributaries during the third week of May, 2022. According to ASDMA, Govt. of Assam, Dima Hasao is the worst affected district in current spell followed by Nagaon, Hojai and Barak valley districts. According to Central Water Commission, River Kopili at Kamrup in Nagaon district, is reported to be flowing in extreme flood situation. Many other tributaries of Brahmaputra river are flowing in severe flood situation (Source: CWC, newsmedia)

## Satellite Observations

This map highlights the inundation in 16 districts of Assam State as on 23 May 2022 (1800Hrs).

## Satellite data used

### Pre-Flood

Satellite: ResourceSat-2  
Sensor: AWiFS  
Date of Pass: 02-Mar-2022

### Post-Flood

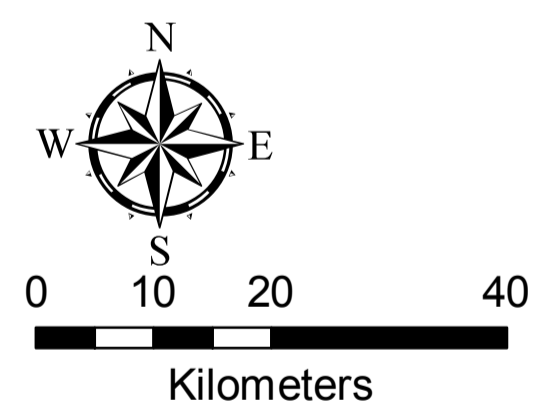
Satellite : Sentinel-1A  
Sensor : SAR  
Date of pass : 23-05-2022  
(1800 Hrs IST)

## Other data used

NRC Landuse/Landcover Data  
Background data -- Shaded Relief

## Legend

- Airport
- Settlement
- District Hq
- State boundary
- District boundary
- Railway Line
- National Highway
- Other Major Roads
- Normal river / Water bodies
- River Bank
- Flood Inundation
- CWC River Gauge- Normal Flood Situation
- CWC River Gauge- Extreme/Severe Flood Situation



This product is prepared on rapid mapping mode for immediate use and sharing amongst official agencies. This provides preliminary results.

Flood inundation may include rain water accumulation / flood water in low lying areas.

All geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials.

No ground verification is done.

RRES  
National Remote Sensing Centre, ISRO  
Dept. of Space, Govt. of India  
Hyderabad- 500 037  
E-Mail: flood@nrsc.gov.in  
www.nrsc.gov.in



Note: When publishing this map as part of any report, source may be indicated as "NRSC (2022) - Flood Inundated areas in Part of Assam State (as on 23 May 2022)" dated 24.05.2022 Map no : 2022/10, NRSC/ISRO, Hyderabad