

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. K H V Durga Rao**

Group Head, Disaster Management Support Group

Phone: 040-23884541,

Fax: 040-23870445

E-mail: [durgarao\\_khv@nrsc.gov.in](mailto:durgarao_khv@nrsc.gov.in)

Date: Jul 11, 2021

No: 07-FL-2021-ASSAM/06

Dear Sir,

Sub: Assam Heavy Rains 2021- Near Real Time Flood Mapping using satellite data

Please refer to our earlier mail dated 4<sup>th</sup> Jul 2021 regarding Near Real Time Flood Inundation Mapping project using satellite data. So far we have sent Five flood maps covering floods in part of Assam State. Heavy incessant rains in upper reaches of Assam during the first week of Jul 2021 has led to inundation/water logging in Part of Assam State. We have analysed Sentinel-1A SAR satellite data of 10<sup>th</sup> Jul 2021 (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 ([bhuvan-noeda.nrsc.gov.in/disaster/disaster.php](http://bhuvan-noeda.nrsc.gov.in/disaster/disaster.php)) NDEM portal for better visualisation 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,  
**(K H V Durga Rao)**

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

# Assam Heavy Rains – 2021

## 1.0 Background

Inundation due to heavy rains were reported in Assam during the first week of Jul, 2021. According to Central Water Commission River Jia Bharali at NT Road Xing in Sonitpur districts was reported to be flowing in severe flood situation leading to inundation in these catchment areas. (Source: CWC, newsmedia)

## 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 10<sup>th</sup> Jul 2021 (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	07-06-2021(0600 Hrs)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
2	09-06-2021(0600 Hrs)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
3	28-06-2021(1800 Hrs)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
4	01-07-2021(0600 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
5	03-07-2021(1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
6	10-07-2021(1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map is being sent.

## 3.0 Data Analysis

Satellite data is rectified and inundation layer is extracted. Further, inundation map was composed for part of Assam state based on the analysis of Sentinel-1A SAR satellite data of 10<sup>th</sup> Jul 2021 (1800 Hrs IST). The inundation layer is integrated with district boundary layer, for extracting district-wise 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 Sivasagar, Lakhimpur & Golaghat districts.
- The Inundation may include water accumulation in low lying areas due to heavy incessant rainfall

**Table-2:**

S. No.	DISTRICT NAME	FLOODED AREA (Ha)
1	SIVASAGAR	28667
2	LAKHIMPUR	22900
3	GOLAGHAT	17218
4	JORHAT	15383
5	DHEMAJI*	11023
6	DIBRUGARH*	8172
7	CHARAIDEO*	5049
8	BISWANATH	4215
9	EAST KARBI ANGLONG	3656
10	HOJAI	2915
11	NOWGONG*	1486
<b>Total Area Affected(Ha)</b>		<b>120684</b>

**Note:**

- Flood inundation may include rain water accumulation / flood water in low lying areas.
- Districts with inundation less than 1000 ha are not included in the statistics
- \* Partially covered in satellite data.

**Distribution List:**

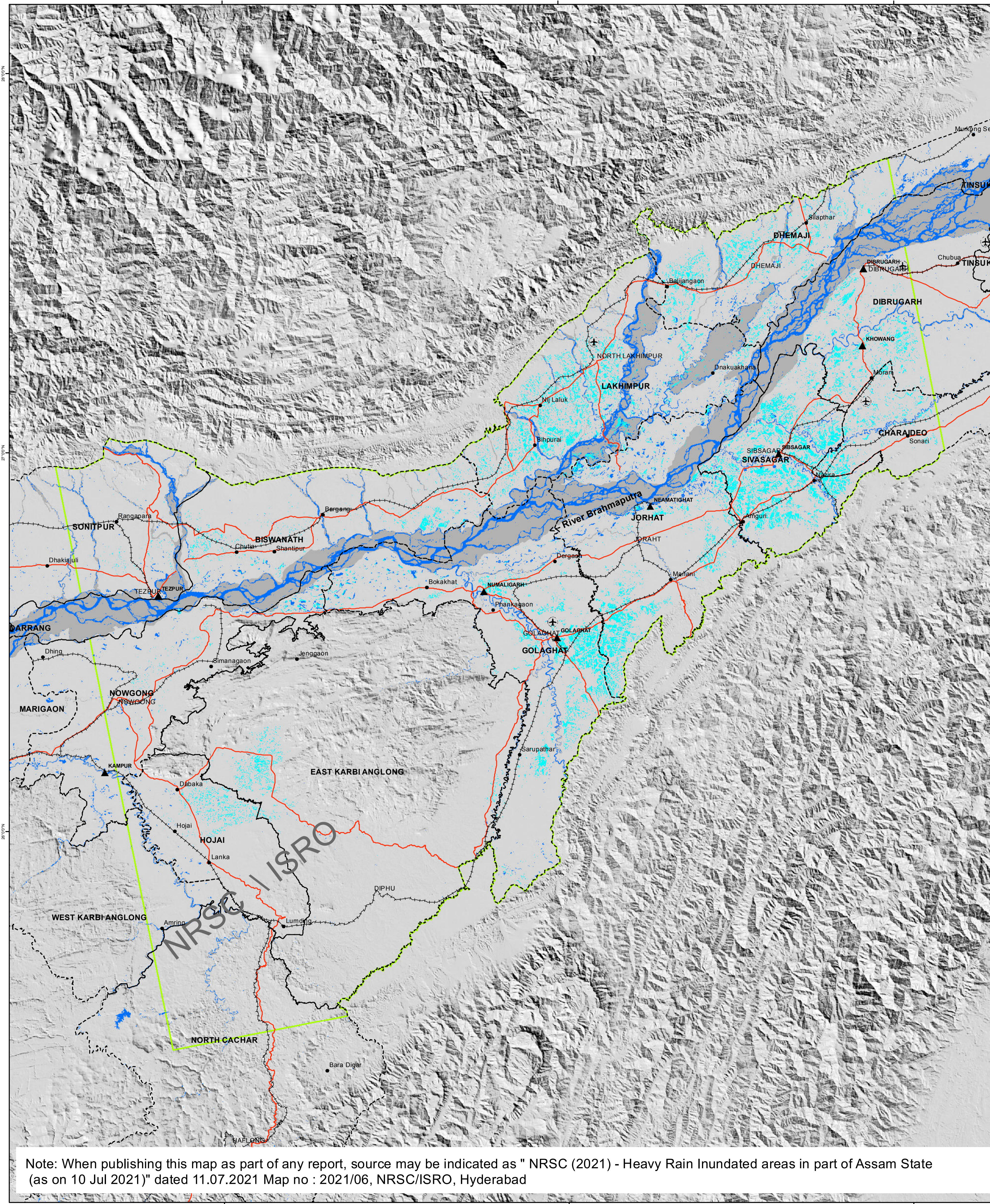
1	MHA	<ol style="list-style-type: none"> <li>1. Joint Secretary, NDM, Ministry of Home Affairs, North Block, New Delhi - 110 001. (Through e-mail).</li> <li>2. NDM control Room, Ministry of Home Affairs, North Block, New Delhi - 110 001 (Through e-mail).</li> </ol>
2	NODAL MINISTRIES	<ol style="list-style-type: none"> <li>1. Chairman, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi-110066</li> <li>2. ADGM (H &amp; A), 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. Deputy Director (RSA) &amp; Project Director, RRES</li> <li>2. Associate Director, NRSC</li> <li>3. Director, NRSC</li> </ol>

# Heavy Rain Inundated Areas in part of Assam State

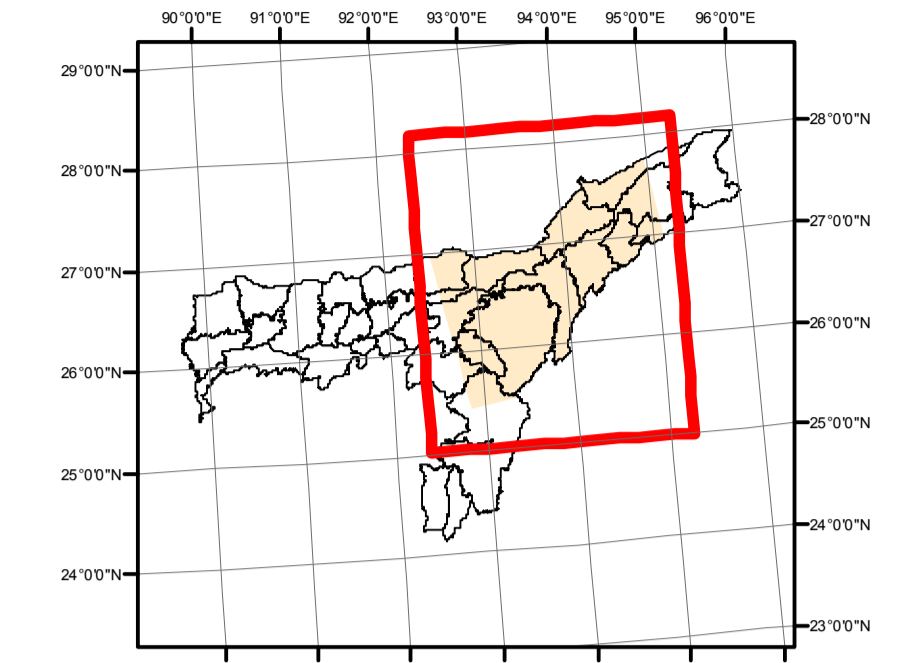
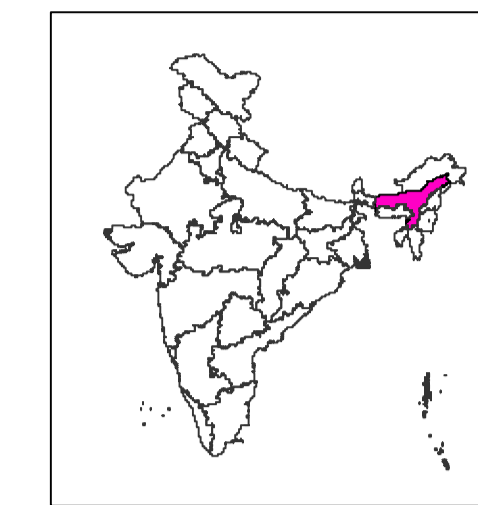
Based on the analysis of SENTINEL-1A SAR satellite data of 10-Jul-2021 ( 1800 Hrs)

DISASTER EVENT ID: 04-FL-2021-ASSAM  
MAP ID: 2021/06

Date of Issue : 11.07.2021



## Location Map



## About the Event

Inundation due to heavy rains were reported in Assam during the first week of Jul,2021. According to Central Water Commission, River Jia Bharali at NT Road Xing in Sonitpur districts were reported to be flowing in severe flood situation leading to inundation in these catchment areas.

(Source: CWC, newsmedia)

## Satellite Observations

This map highlights the inundation in 11 districts of Part of Assam State as on 10 Jul 2021

## Satellite data used

Pre Flood:  
Satellite: ResourceSat-2  
Sensor: AWiFS  
Date of Pass: 01-Feb-2021

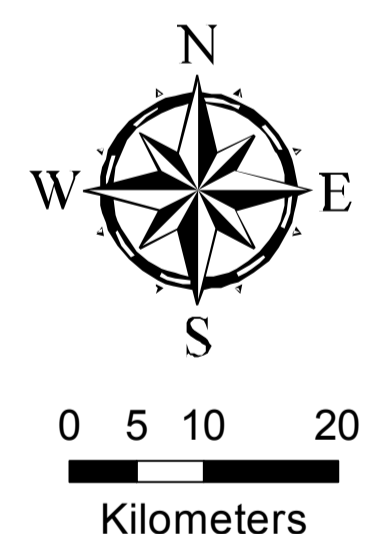
Post Flood:  
Satellite: Sentinel-1A  
Sensor: SAR  
Date: 10-07-2021 (1800 hrs IST)

## Other data used

NRC Landuse/Landcover Data  
Background data -- Shaded Relief

## Legend

- Airport
- Settlement
- State boundary
- District boundary
- Railway Line
- National Highway
- Other Major Roads
- Normal river / Water bodies
- River Bank
- Flood Inundation
- Area Covered By Satellite
- CWC River Gauge- Normal Flood Situation
- CWC River Gauge- 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 (2021) - Heavy Rain Inundated areas in part of Assam State (as on 10 Jul 2021)" dated 11.07.2021 Map no : 2021/06, NRSC/ISRO, Hyderabad