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

सत्यमेव जयते

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

Date: Jul 16, 2021

No: 07-FL-2021-ASSAM/09

Dear Sir,

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

Please refer to our earlier mail dated 15th Jul 2021 regarding Near Real Time Flood Inundation Mapping project using satellite data. So far we have sent Eight 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 15th 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) 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 district is reported to be flowing in severe flood situation and many tributaries of Brahmaputra are in Above normal flood situation (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 15th 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 was sent.
7	13-07-2021(1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
8	13-07-2021(2100 Hrs IST)	NOVASAR-1	Analysed and 1 flood map was sent.
9	15-07-2021(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 15th 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 Hojai, Sonitpur,Nowgong, East Karbi Anglong, Udalguri & Barpeta districts.
- **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	HOJAI	22253
2	SONITPUR*	22075
3	NOWGONG*	20908
4	EAST KARBI ANGLONG*	18495
5	UDALGURI*	17284
6	BARPETA*	12380
7	MARIGAON	10273
8	BASKA*	10200
9	DARRANG*	7962
10	BISWANATH*	7794
11	NALBARI	5564
12	WEST KARBI ANGLONG	5125
13	KAMRUP	2490
14	EAST KAMRUP	1670
TOTAL		**164474**

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	1. Joint Secretary, NDM, Ministry of Home Affairs, North Block, New Delhi - 110 001. (Through e-mail). 2. NDM control Room, Ministry of Home Affairs, North Block, New Delhi - 110 001 (Through e-mail).
2	NODAL MINISTRIES	1. Chairman, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi-110066 2. ADGM (H & A), India Meteorological Department, Mausam Bhavan, New Delhi -110003
3	STATE	1. Additional Chief Secretary & Relief Commissioner, Govt. of Assam, Janatha Bhavan, Assam Secretariat, Dispur, GUWAHATI-781005. (Hard copy of the map through NESAC/ARSAC also). 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.)
4	ISRO/DOS	1. Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail) 2. Programme Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail) 3. Associate Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail)
5	NRSC	1. Deputy Director (RSA) & Project Director, RRES 2. Associate Director, NRSC 3. Director, NRSC

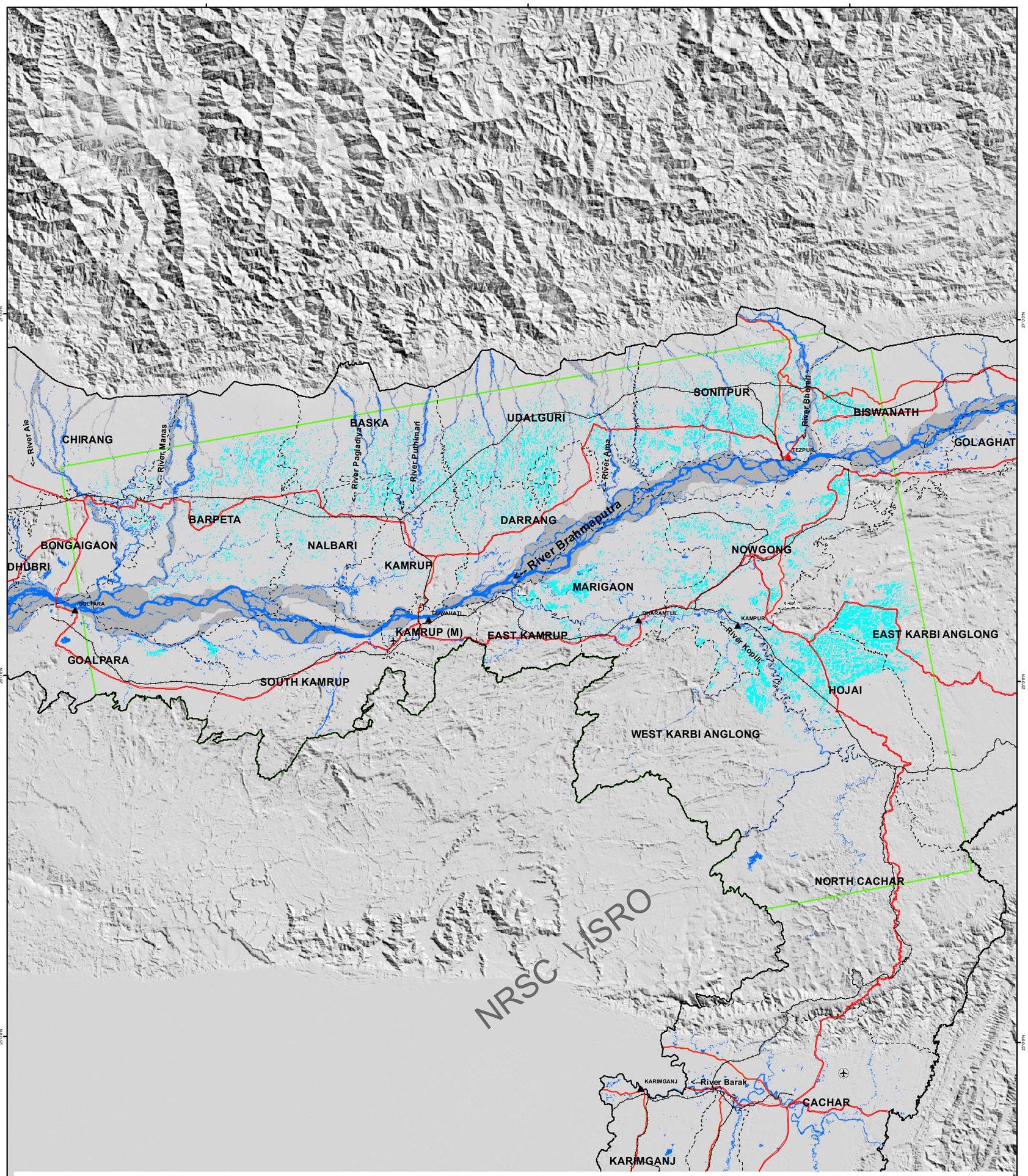
Flood Inundated Areas in Part of Assam State

Based on the analysis of Sentinel-1A SAR satellite data of 15-Jul-2021 (1800 Hrs)

For official use

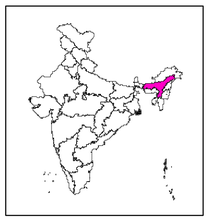
DISASTER EVENT ID: 07-FL-2021-ASSAM
MAP ID: 2021/09

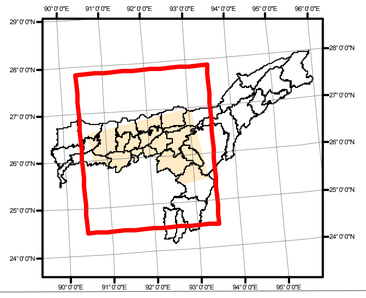
Date of Issue : 16.07.2021



Note: When publishing this map as part of any report, source may be indicated as " NRSC (2021) - Flood Inundated areas in Part of Assam State (as on 15 Jul 2021)" dated 16.07.2021 Map no : 2021/09, NRSC/ISRO, Hyderabad

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 was reported to be flowing in severe flood situation and many tributaries of Brahmaputra are in Above normal flood situation (Source: CWC, newsmedia)

Satellite Observations

This map highlights the inundation in 14 districts of Assam State as on 15 Jul 2021(1800 Hrs).

Satellite data used

Pre-Flood

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

Post-Flood

Satellite : Sentinel-1A
Sensor : SAR
Date of pass : 15-07-2021 (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- Above Normal/Severe Flood Situation

N W E S

0 5 10 20
Kilometers

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

इसरो isro
nrsc