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Disaster Management Support Group

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Date: Jun 28, 2022

No: 02-FL-2022-ASSAM/29

Dear Sir,

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

Please refer to our earlier mail dated 27th Jun 2022 regarding Near Real Time Flood Inundation Mapping project using satellite data. So far we have sent 28 flood maps covering floods in part of Assam State. Heavy incessant rains in many regions of Assam during the third week of Jun 2022 has led to floods in Assam State. We have analysed IRS SAR data of 27th Jun 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?ld=flood>) NDEM portal (<https://ndem.nrsc.gov.in>) for better visualization of flood extent in Assam State.

In addition, the inundation 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 incessant rains followed by rise in water levels of Brahmaputra & its tributaries during the third week of Jun, 2022. According to ASDMA, Govt. of Assam, Silchar & Barak valley is the worst affected due to floods. According to Central Water Commission, Brahmaputra river and its tributaries are flowing in severe flood situation at many sites and Barak river is flowing in severe flood situation and has inundated many low lying areas along its banks. (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. IRS SAR data of 27th Jun 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 was sent.
11	24-05-2022	MODIS AQUA	Analysed and 1 flood map was sent.
12	25-05-2022 (1100 Hrs IST)	ALOS-2 PALSAR	Analysed and 1 flood map is being sent.
13	25-05-2022 (1800	Sentinel-1 A SAR	Analysed and 1 flood map was sent.

	Hrs IST) & 26-05-2022 (0600 Hrs IST)		
14	26-05-2022	MODIS TERRA	Analysed and 1 flood map was sent.
15	16-06-2022 (1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
16	16-06-2022 (0600 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
17	17-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
18	18-06-2022 (1800 Hrs IST) 19-06-2022 (0600 Hrs IST)	IRS SAR & Sentinel-1A SAR	Analysed and 1 flood map was sent.
19	19-06-2022 (1800 Hrs IST)	RADARSAT-2 SAR	Analysed and 1 flood map was sent.
20	20-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
21	21-06-2022 (0900 Hrs IST)	NOVA SAR	Analysed and 1 flood map was sent.
22	21-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
23	21-06-2022 (1800 Hrs IST)	Sentinel-1A SAR	Analysed and 1 flood map was sent.
24	22-06-2022 (1100 Hrs IST)	ALOS-2 PALSAR	Analysed and 1 flood map was sent.
25	23-06-2022 (1800 Hrs IST) & 24-06-2022 (0600 Hrs IST)	IRS SAR & Sentinel-1A SAR	Analysed and 1 flood map was sent.
26	24-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
27	25-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
28	26-06-2022 (1800 Hrs IST)	IRS SAR	Analysed and 1 flood map was sent.
29	27-06-2022 (1800 Hrs IST)	IRS 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 IRS SAR data of 26th Jun 2022 (1800 Hrs IST). The 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 Dhubri district.
- 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	DHUBRI	5688
2	GOALPARA*	1837
3	SOUTH SALMARA	1540
4	BONGAIGAON*	750
	TOTAL	9816

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">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).3. DG, NDRF, New Delhi
2	NODAL MINISTRIES	<ol style="list-style-type: none">1. Director, FCA, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi-1100662. Deputy Director General, Hydrology, India Meteorological Department, Mausam Bhavan, New Delhi -110003
3	STATE	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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	<ol style="list-style-type: none">1. Group Head, DMSG, NRSC2. Deputy Director (RSA) & Project Director, RRES3. Associate Director, NRSC4. Director, NRSC

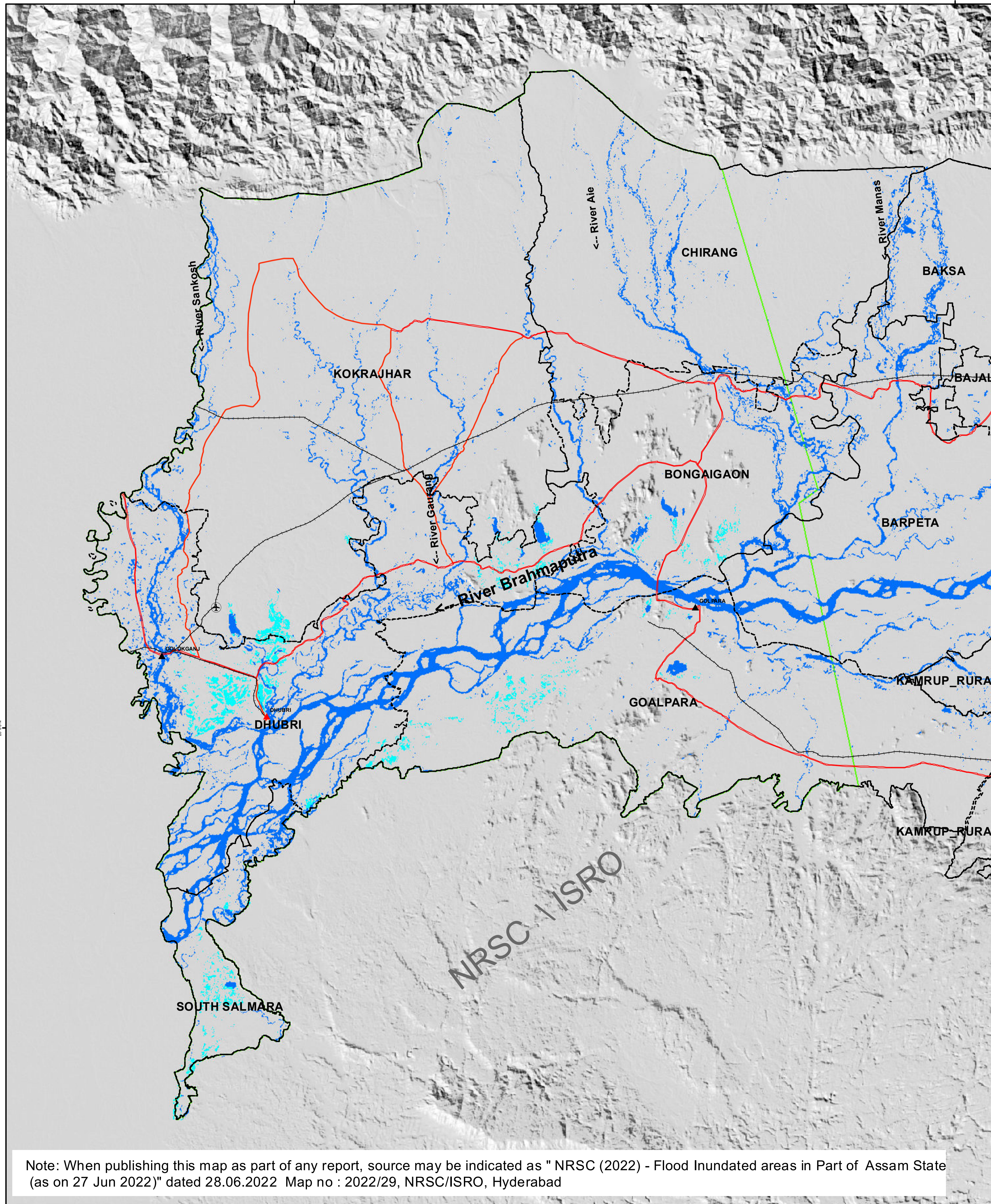
Flood Inundated Areas in Part of Assam State

Based on the analysis of IRS SAR satellite data of 27-Jun-2022 (1800 Hrs IST)

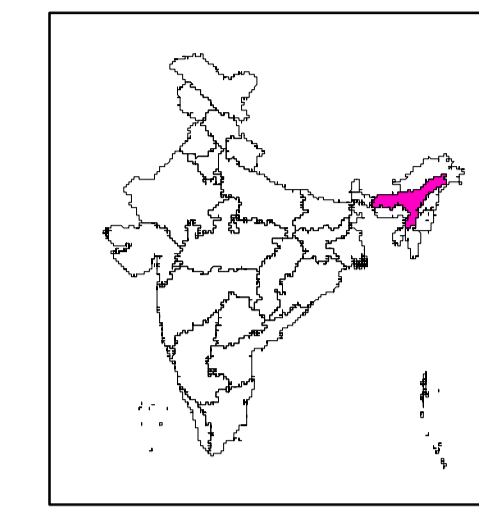
For official use

DISASTER EVENT ID: 02-FL-2022-ASSAM
MAP ID: 2022/29

Date of Issue : 28.06.2022



Location Map



About the Event

Floods were reported in Assam due to heavy incessant rains followed by rise in water levels of Brahmaputra & its tributaries during the third week of Jun, 2022. According to ASDMA, Govt. of Assam, Kamrup-metro is the worst affected district due to flash floods. According to Central Water Commission, River Manas N H Crossing, Pagladiya at N T Crossing, Brahmaputra at Dhubri, Brahmaputra at Nematighat are flowing in severe flood situation. (Source: CWC, newsmedia)

Satellite Observations

This map highlights the inundation in 4 districts of Assam State as on 27 Jun 2022 (1800 Hrs IST).

Satellite data used

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

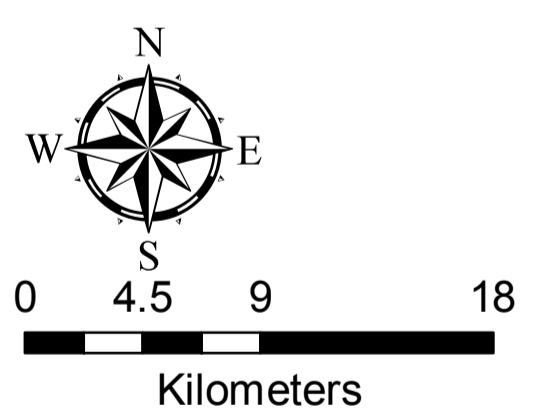
Post-Flood
Satellite : IRS
Sensor: SAR
DOP: 27-Jun-22 (1800 Hrs IST)

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.

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www.nrs.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 27 Jun 2022)" dated 28.06.2022 Map no : 2022/29, NRSC/ISRO, Hyderabad