

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
Head, Disaster Management Support Division

Phone: 040-23884541, Fax: 040-23870445
e-mail: durgarao_khv@nrsc.gov.in

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No: 05-FL-2018-KL/11

Dear Sir,

Sub: Kerala Floods 2018- Near Real Time Inundation Mapping using satellite data

Please refer to our earlier mail dated 21st August 2018 regarding 'Near Real Time Flood Mapping' project using satellite data. So far we have sent TEN flood maps covering floods in Kerala State. Inundation is reported in parts of Kerala State due to heavy incessant rains during second week of August. We have analyzed Radarsat-2 & Sentinel-1 A SAR data of 21st August 2018 (1830Hrs) and a flood map for part of Kerala state is prepared. The flood map along with a brief report is enclosed here with for your information. Since the image was acquired during/immediate to the rainfall event, 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 visualization of flood extent in Kerala State.

In addition, the flood layer in GIS ready format and inundation statistics are transmitted to KSDMA by e-mail for further value addition and dissemination to concerned user departments.

We will continue to keep a watch on the inundation 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,

(Dr. KHV Durga Rao)

As per the distribution list enclosed in the report.

Kerala Floods – 2018

1.0 Background

Heavy incessant rains were reported in Kerala state during the second and third week of August 2018, as many as 39 dams across the state were opened contributing to the severe flooding in the state which is experiencing the worst August rainfall in 87 years., Several districts are reported to be inundated due to heavy rains.

Source: (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 flood affected areas. Radarsat-2 & Sentinel-1 A SAR satellite data of 21st August 2018 (1830 Hrs) was analyzed. (Refer Table-1).

Table-1 Satellite Data acquired over Flood Affected Area

S No	Date	Satellite/ Sensor	Status
1	16-07-18	Sentinel-1 SAR	Analyzed and 1 flood map was sent
2	21-07-18	Radarsat-2 SAR	Analyzed and 1 flood map was sent
3	9-08-18	Sentinel-1 SAR	Analyzed and 1 flood map was sent
4	11-08-18	Radarsat-2 SAR	Analyzed and 1 flood map was sent
5	14-08-18	Radarsat-2 SAR	Analyzed and 1 flood map was sent
6	14-08-18	Radarsat-2 and ALOS-2 PALSAR-2	Analyzed and 1 flood map was sent
7	17-08-18	ALOS-2 PALSAR-2	Analyzed and 1 flood map was sent.
8	18-08-18	TERRASAR-X	Analyzed and 1 flood map was sent.
9	18-08-18	Radarsat-2 SAR	Analyzed and 1 flood map was sent.
10	21-08-18	Radarsat-2 SAR	Analyzed and 1 flood map was sent.
11	21-08-18 (1830Hrs)	Radarsat-2 SAR & Sentinel-1A SAR	Analyzed and 1 flood map is being sent.

3.0 Data Analysis

Satellite data is rectified and inundation layer is extracted. Further, flood inundation map was composed for Kerala state based on the analysis of Radarsat-2 & Sentinel-1 A SAR satellite data of 21st August 2018 (1830 Hrs).The inundation layer is integrated with

District boundary layer, for extracting district-wise inundation statistics shown in the Table-2.

4.0 Observations

- Satellite data covers part of Kerala state.
- Major Flood inundation is observed in Alappuzha, Kottayam and Thrishur districts.
- Flood inundation is observed to have decreased in Alappuzha, Kottayam, Pattanamthitta and Kollam districts compared to inundation of 18th August 2018.

Table-2

S.No	District	Flood Inundated Area (ha)
1	ALAPPUZHA	18137
2	KOTTAYAM	10187
3	TRISHSHUR	8342
4	KOLLAM	2215
5	PATTANAMTITTA	1798
6	MALAPPURAM*	918
7	ERNAKULAM	754
8	THIRUVANANTHAPURAM	112
	Total	42463

Disclaimer :

- 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.
- Due to dense forest cover some area under the flood may not have been captured
- * partially covered in satellite data

Distribution List (through e-mail):

1	MHA	1. Joint Secretary, NDM, Ministry of Home Affairs, North Block, New Delhi. 2. NDM control Room, Ministry of Home Affairs, North Block, New Delhi 3. Director, DM-III, NDM, Ministry of Home Affairs, North Block, New Delhi.
2	NDMA	1. Vice Chairman, National Disaster Management Authority (NDMA), New Delhi 2. Control Room, National Disaster Management Authority (NDMA), New Delhi
3	NODAL MINISTRIES	1. Chairman, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi 2. ADGM (H & A), India Meteorological Department, Mausam Bhavan, New Delhi
4	STATE	1. State Remote Sensing Center. 2. Member Secretary State Disaster Management Authority
5	ISRO/DOS	1. Programme Manager, Disaster Management Support Programme, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore. 2. Programme Director, Disaster Management Support Programme, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore.
6	NRSC	1. Deputy Director (RSA) & Project Director, DSC 2. Associate Director, NRSC 3. Director, NRSC
