

2018 Floods Sri Lanka

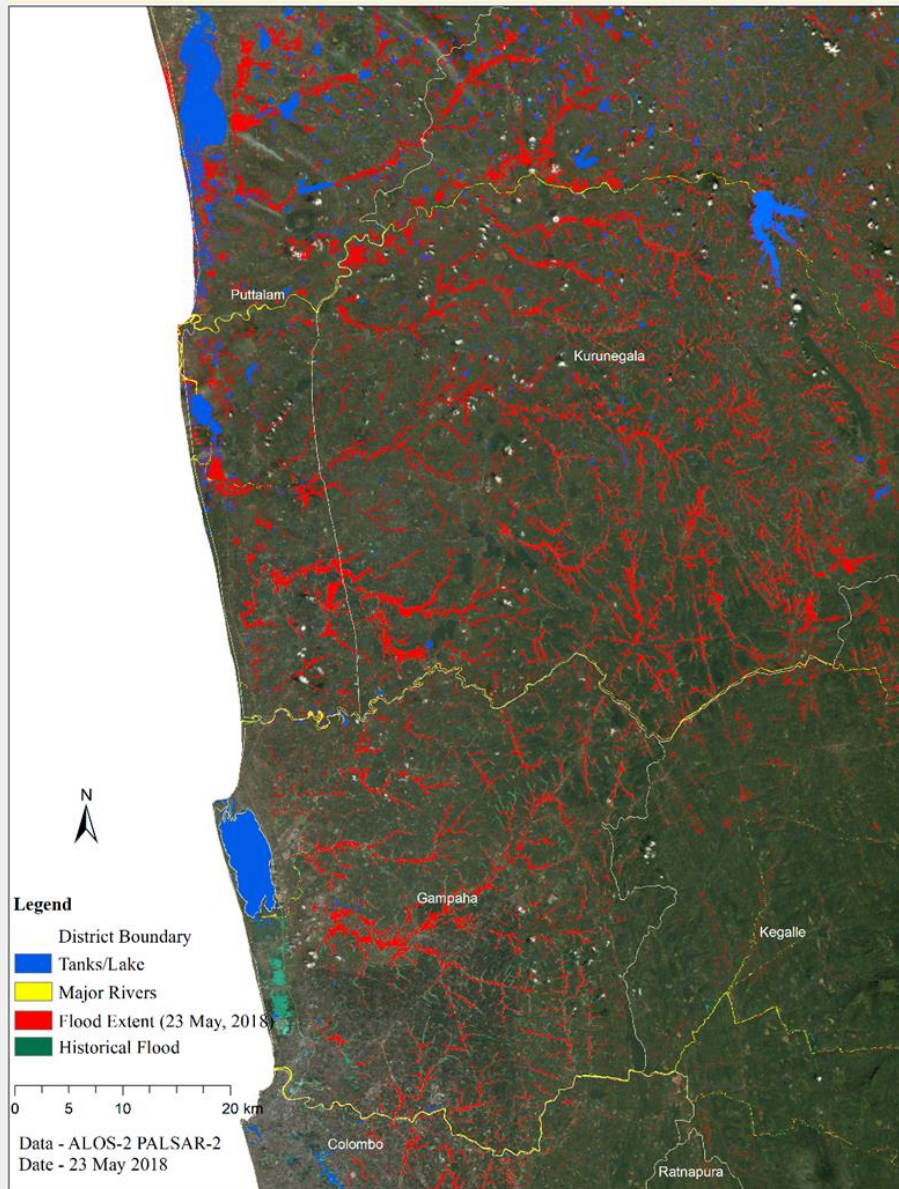
The draft report compiled by International Water Management Institute (IWMI) with the support of CGIAR Research Program on Water, Land and Ecosystems (WLE) in collaboration with Disaster Management Centre (DMC), Irrigation Department, Department of Meteorology.

Also we would like to thank Joint Research Centre (JRC), European Commission; Jaxa/NASA for GPM, National Oceanic and Atmospheric Administration (NOAA), Indian Meteorological Department (IMD) and Ventusky

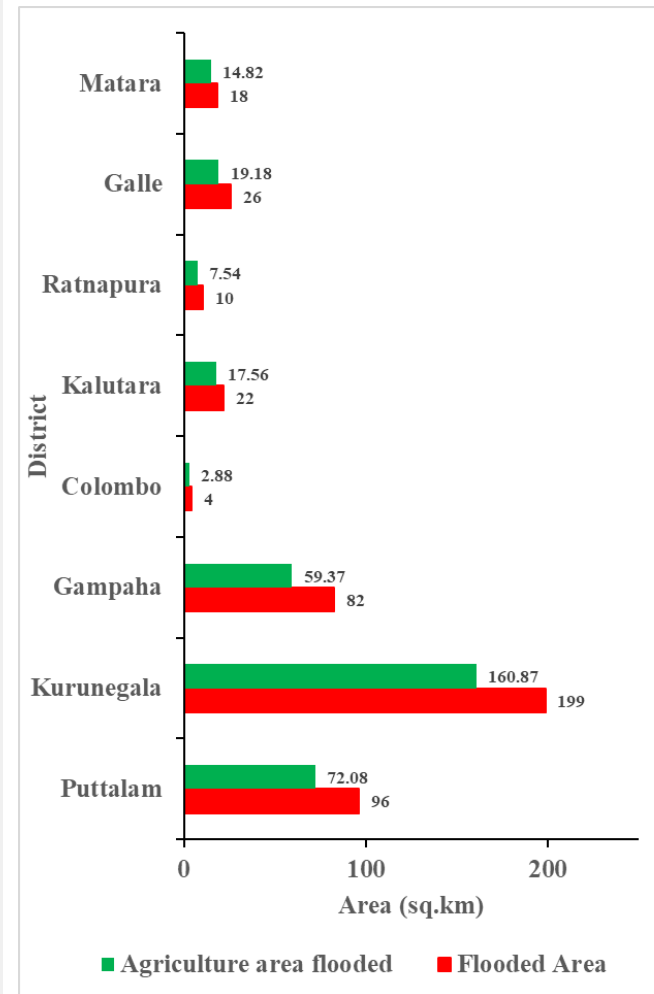
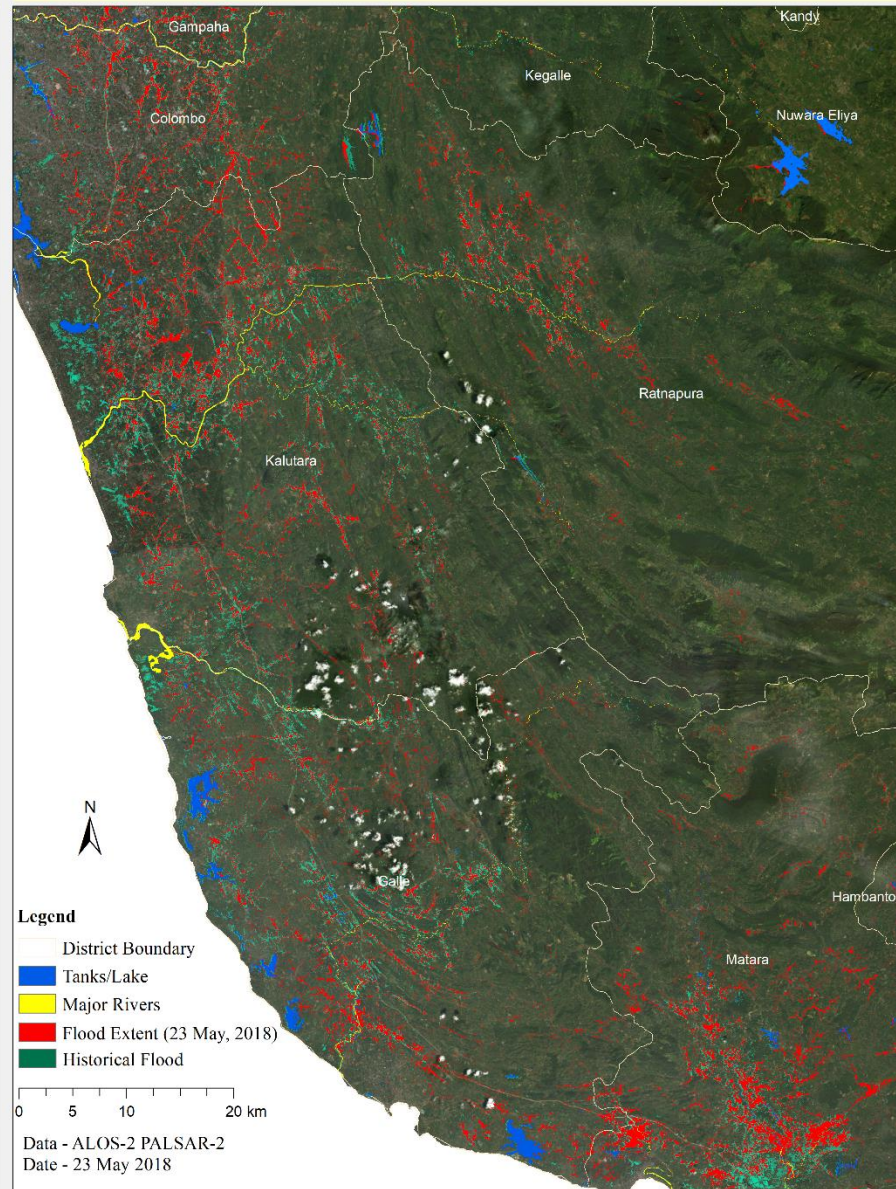


FLOOD INUNDATION EXTENT AND DISTRICT WISE DAMAGE ASSESSMENT, SRI LANKA 2018

Flood Situation of Gampaha, Puttalam, and Kurunegala district on 23 May, 2018




Flood Situation of Colombo, Kalutara, Galle and Matara district on 23 May, 2018



DETAILED FLOOD INUNDATION EXTENT, NORTH WESTERN PROVINCE, SRI LANKA 2018

Mapping Inundation extent for Puttalam District in North Western Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 8 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

The initial satellite observations from ALOS-2 PALSAR-2 (23 May 2018) showed vast areas of standing flood waters along the North Western, Western and Southern Provinces. Initial estimates from satellite images indicate that Puttalam (96.1 sq.km), Kurunagala (198.6 sq.km), Gampaha (82.46 sq.km) Galle (25.5 sq.km), Kaluthara (22.1 sq.km), Rathnapura (10.4 km sq), Colombo (4.2 sq.km). Most of the district flood is reducing but rivers are still under minor flood level.

The satellite image from ALOS-2 PALSAR-2 taken on 23 May 2018 showing considerable inundation for Galle and reference to dark with deep water and dark grey color in the agriculture fields with water.


Legend

Satellite Image : ALOS-2 PALSAR-2
23 May 2018


- Cities/Town
- SL DSD
- Flood extent (23 May 2018)
- Permanent water

24 May 2018 | FL-2018-0006-SL | Version 1

Map Prepared for




Map Prepared by



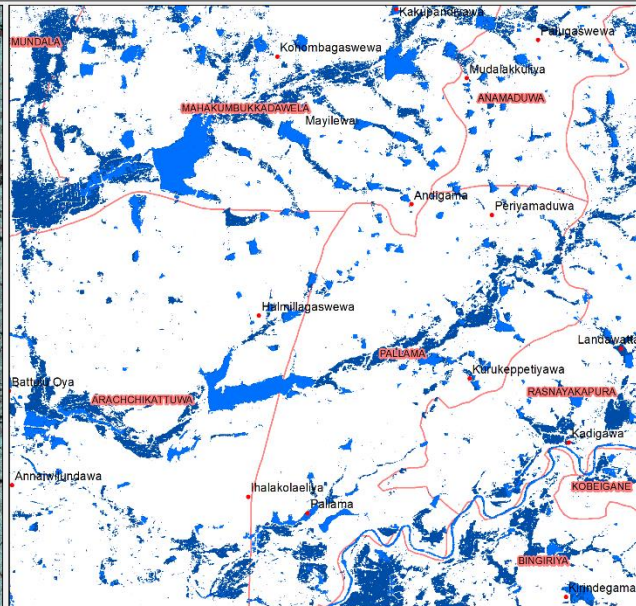
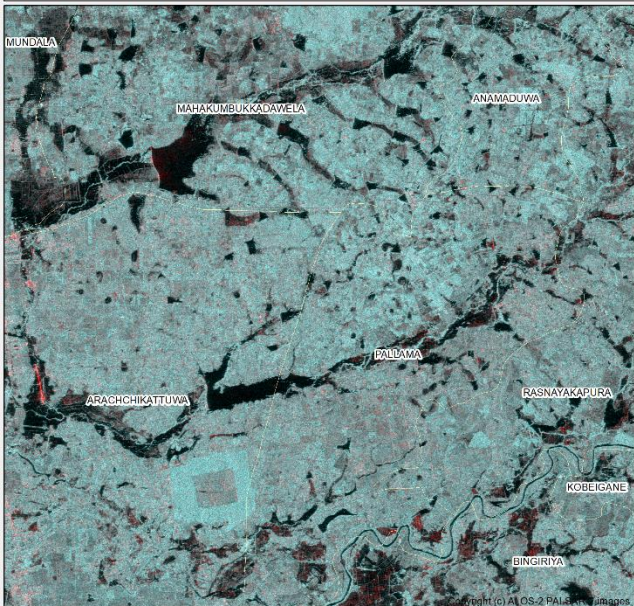
The analysis excluded permanent water bodies including reservoir, tanks and ponds and this reflects only the inundation extent. Please note the surface water extent mapped has not yet been validated in the field.

The depiction and use of boundaries, geographic names and related data shown in these maps are based on the sources they have been drawn from and quoted. These are neither error-free nor do they imply official endorsement or the position of IWMI.


Data Provider



0 1 2 4 Km



Mapping Inundation extent for Kurunegala District in North Western Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 8 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

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Legend

Satellite Image : ALOS-2 PALSAR-2
23 May 2018


- Cities/Town
- SL DSD
- Flood extent (23 May 2018)
- Permanent water

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Map Prepared for




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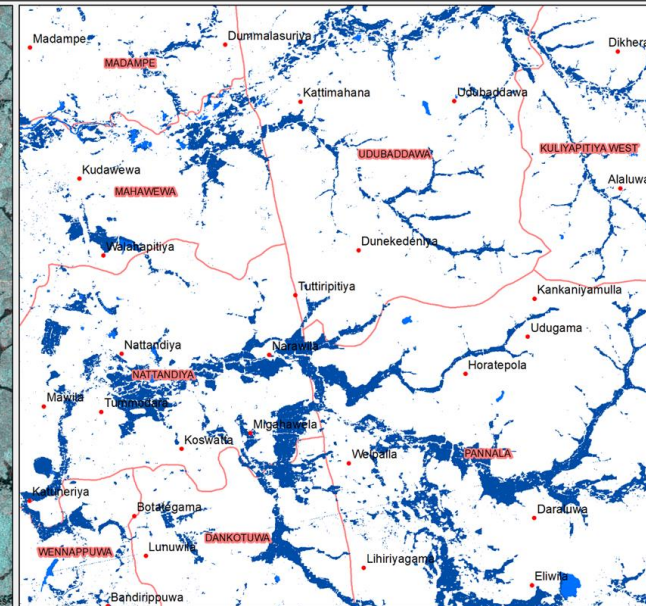
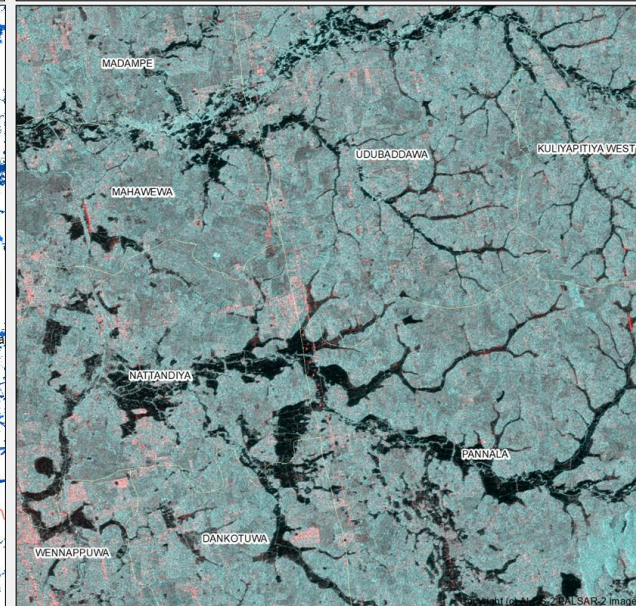
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Data Provider




0 1 2 4 Km



DETAILED FLOOD INUNDATION EXTENT, WESTERN PROVINCE, SRI LANKA 2018

Mapping Inundation extent for Gampaha District in Western Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 6 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

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The satellite image from ALOS-2 PALSAR-2 taken on 23 May 2018 showing considerable inundation for Galle and reference to dark with deep water and dark grey color in the agriculture fields with water.


Legend

- Cities/Town
- SL DSD
- Current (23 May 2018)
- Historical Flood
- Permanent water


Satellite Image : ALOS-2 PALSAR-2
23 May 2018

24 May 2018 | FL-2018-0003-SL | Version 1

Map Prepared for




Map Prepared by

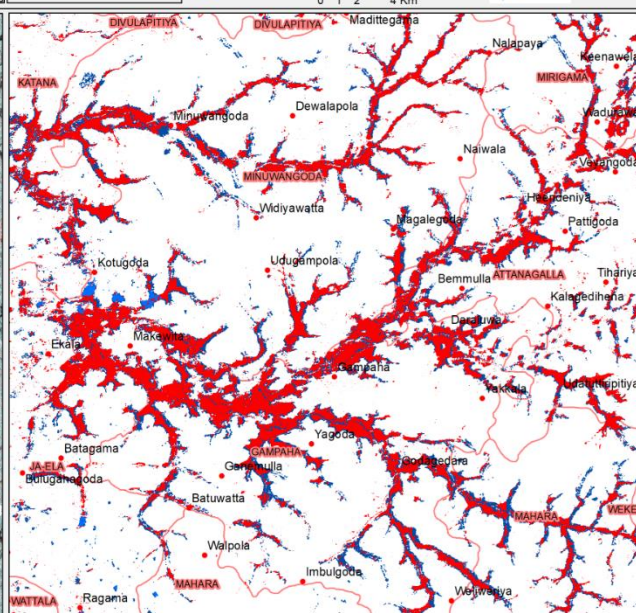
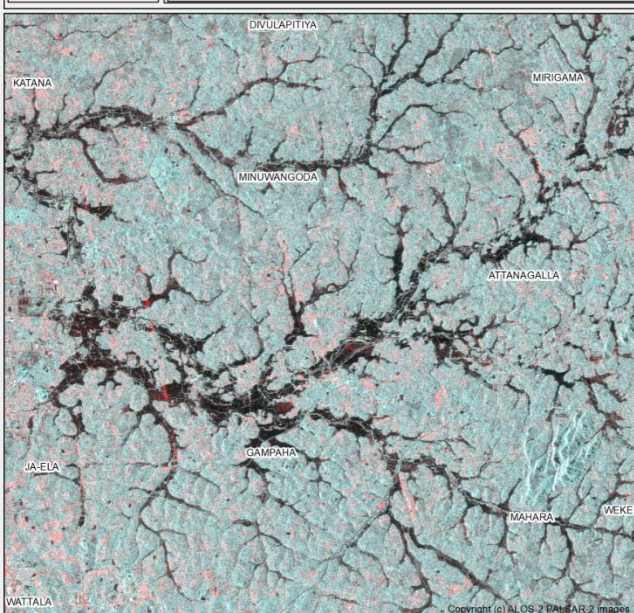


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Data Provider





Mapping Inundation extent for Colombo District in Western Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 6 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

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The satellite image from ALOS-2 PALSAR-2 taken on 23 May 2018 showing considerable inundation for Galle and reference to dark with deep water and dark grey color in the agriculture fields with water.


Legend

- Cities/Town
- SL DSD
- Current (23 May 2018)
- Historical Flood
- Permanent water


Satellite Image : ALOS-2 PALSAR-2
23 May 2018

24 May 2018 | FL-2018-0003-SL | Version 1

Map Prepared for




Map Prepared by

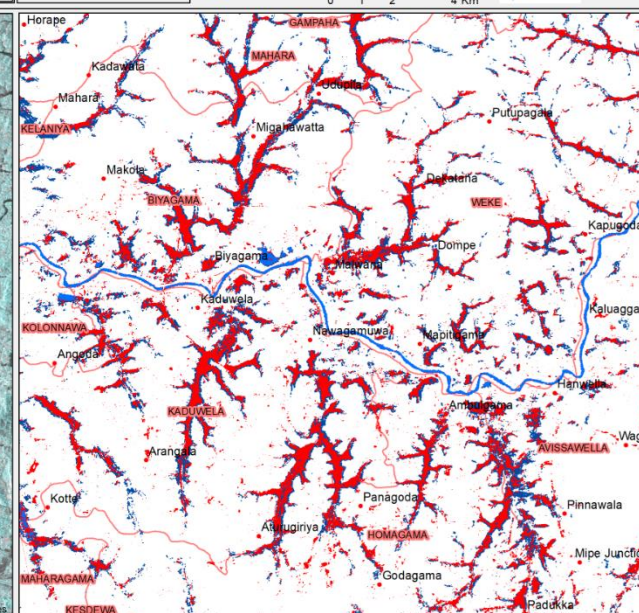
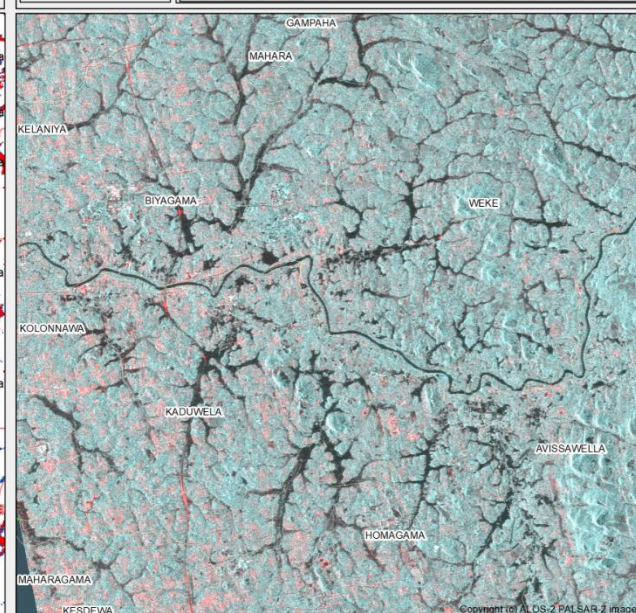


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Data Provider





DETAILED FLOOD INUNDATION EXTENT, WESTERN AND SOUTHERN PROVINCE, SRI LANKA 2018

Mapping Inundation extent for Kalutara District in Western Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 6 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

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Legend

Satellite Image : ALOS-2 PALSAR-2
23 May 2018


- Cities/Town
- SL DSD
- Current (23 May 2018)
- Historical Flood
- Permanent water

24 May 2018 | FL-2018-0002-SL | Version 1

Map Prepared for




Map Prepared by

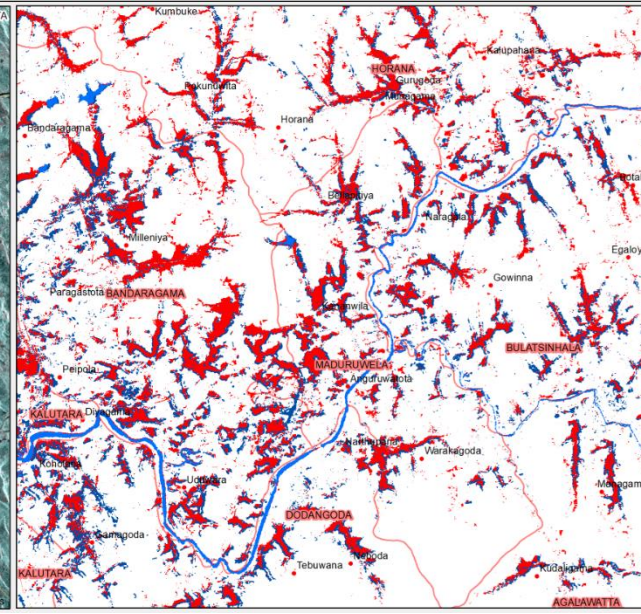
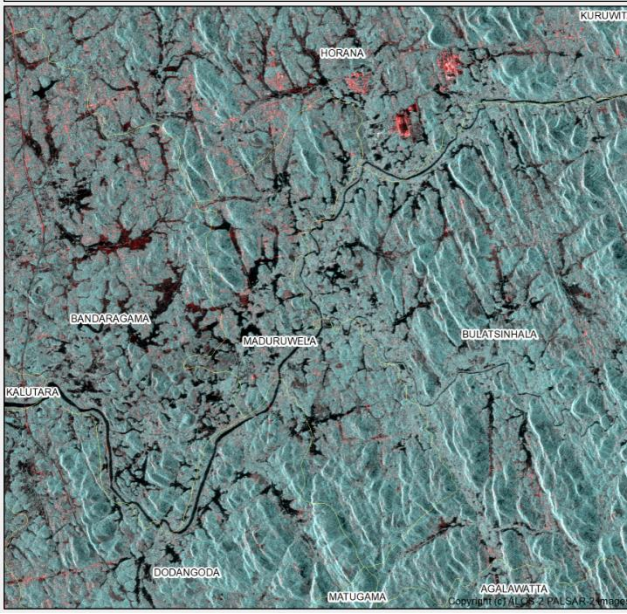


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Mapping Inundation extent for Galle District in Southern Province (Sri Lanka) using ALOS 2 PALSAR 2 Satellite Data (23 May 2018)



Heavy rainfall occurred on 20th and 21st May 2018 which has resulted in flooding forcing evacuation of people in low-lying areas where four Major rivers have reached flood levels, while 6 districts are on "red alert" for possible landslides. About 153,500 people have been affected by the floods. The death toll in Sri Lanka's monsoon rains has climbed to 12 as 24th May 2018 (DMC reports).

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Legend

Satellite Image : ALOS-2 PALSAR-2
23 May 2018


- Cities/Town
- SL DSD
- Current (23 May 2018)
- Historical Flood
- Permanent water

24 May 2018 | FL-2018-0003-SL | Version 1

Map Prepared for




Map Prepared by

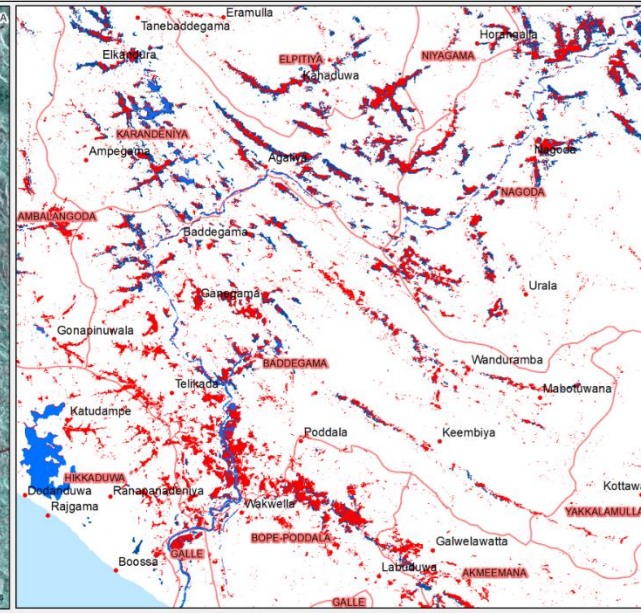
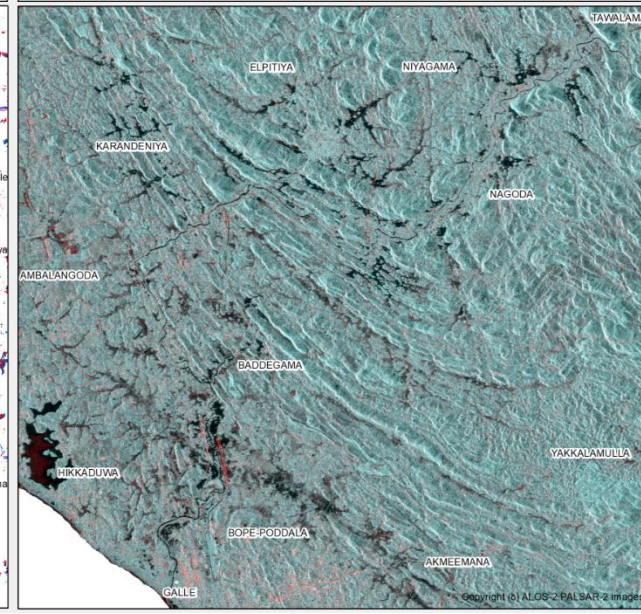


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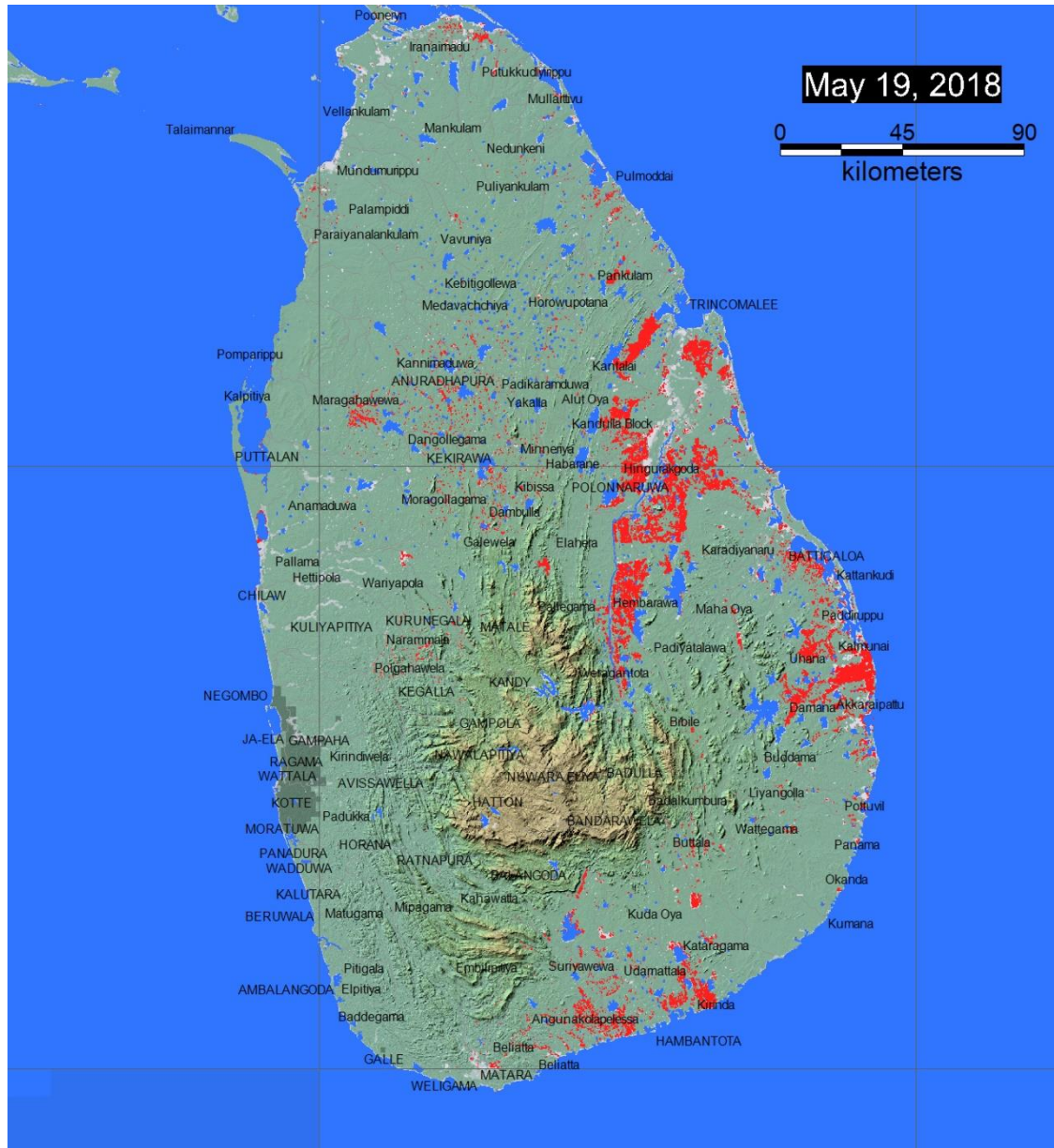
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COUNTRY LEVEL FLOOD INUNDATION EXTENT, SRI LANKA 2018



A storm that swept across several parts of Sri Lanka between 20 and 21 May, 2018, caused flash floods in several areas, with Southern, Western and Sabaragamuwa Provinces the worst affected. Parts of North Western Province also recorded heavy rainfall. Mapped areas in red are captured by remote sensing data dated May 19, 2018 inundated croplands and habitat. Unfortunately the satellite footprint for southern and western province is not available still expected by today to map precise inundated area and crop damages.

Red is flooding mapped from Copernicus Sentinel 1 SAR data provided by the European Space Agency. **Blue** is a reference normal water extent. Light gray is all previously mapped flooding.

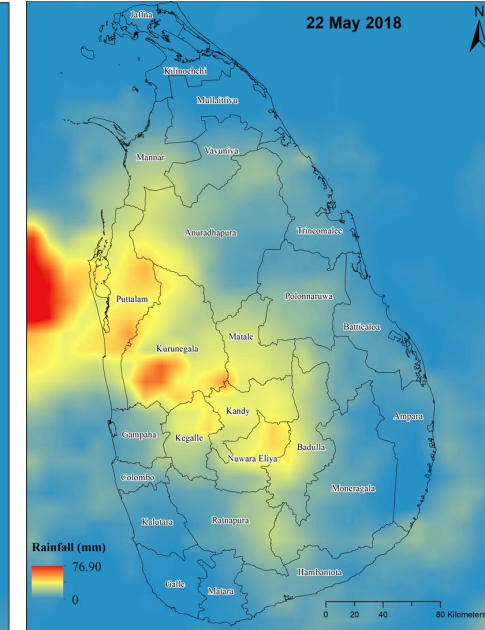
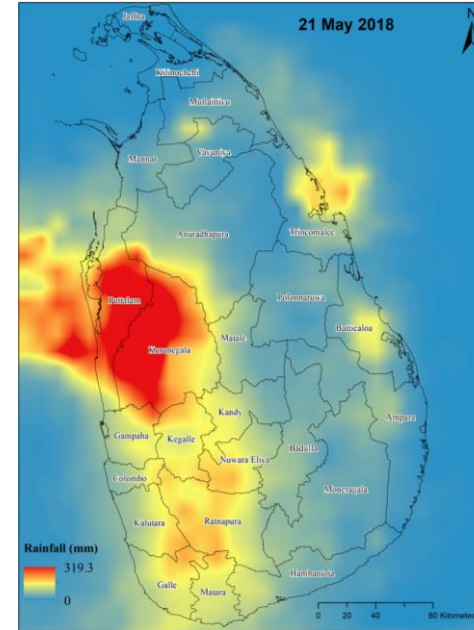
Map Produced by Dartmouth Flood Observatory, University of Colorado, USA

FLOOD MONITORING USING SATELLITE RAINFALL ESTIMATION SRI LANKA IN 2018

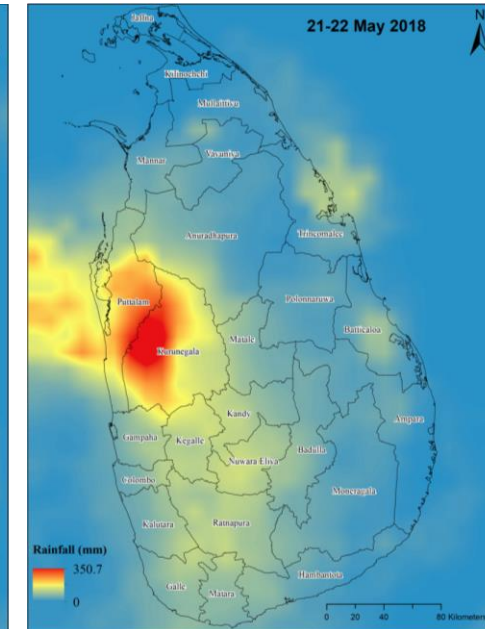
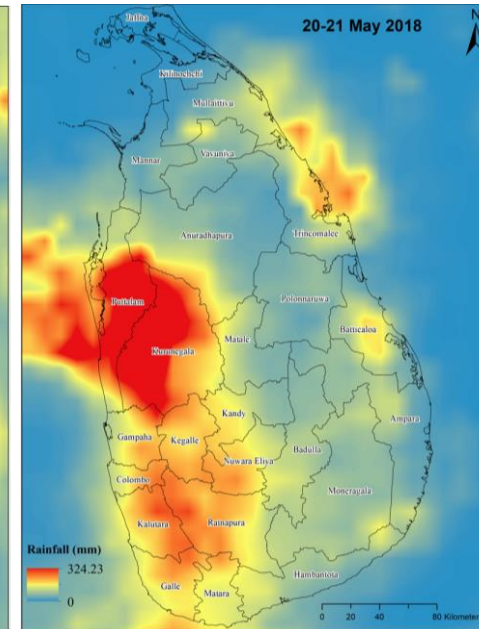
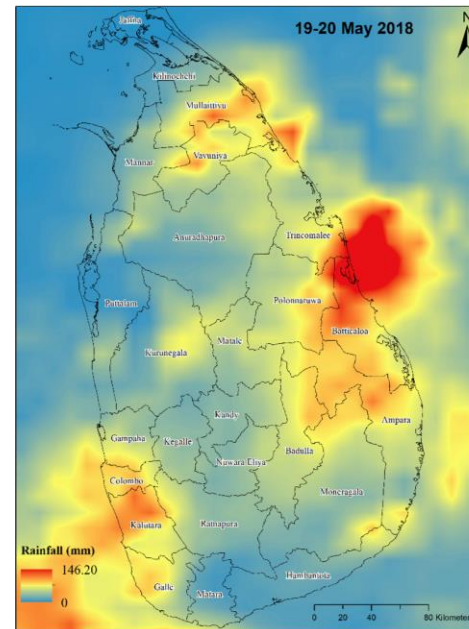
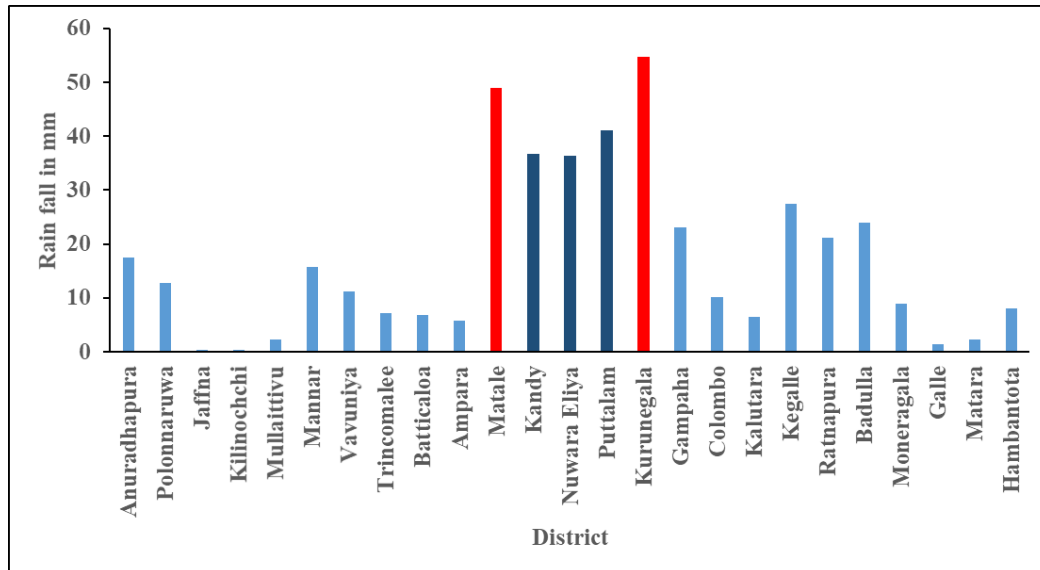
Satellite rainfall estimation from Global Precipitation Mission (GPM) revealed high rainfall in Sri Lanka caused by the usual strong monsoon over the period of two days (20 to 22 of May 2018). Fifteen districts have been already affected by extreme rainfall and several major rivers as Kelani Ganga, Kalu Ganga, Gin Ganga, Nilwala Ganga have started to overflow and still under minor flood level. In addition main rivers, Mahaoya, Attanagalu Oya overflow and few major tanks spill are reported in Kurunagala and Puttalam district.

In last 24 hours (22 of May 2018) as per GPM estimates, precipitation has reduced and only five districts have recorded more than 30mm precipitation, which are as follows **Kurunagala (54.36 mm), Matale (48.90mm)**, Puttalam (41.08mm), Nuwara Eliya (36.4 mm) and Kandy (36.64 mm).

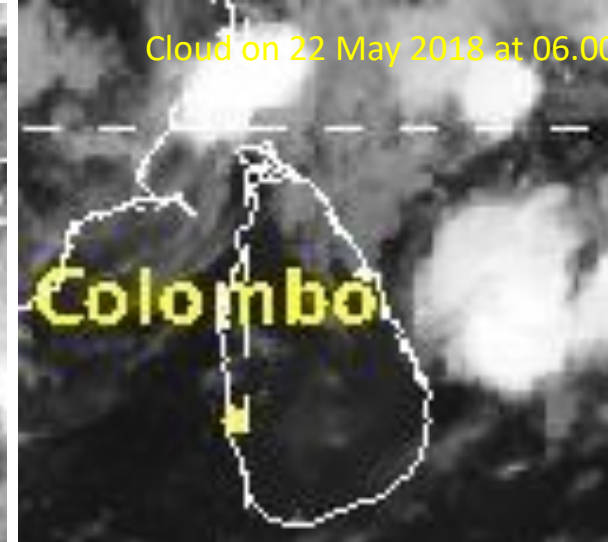
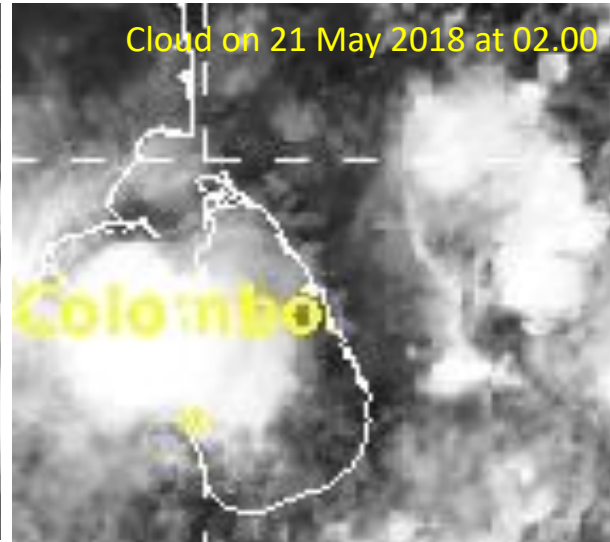
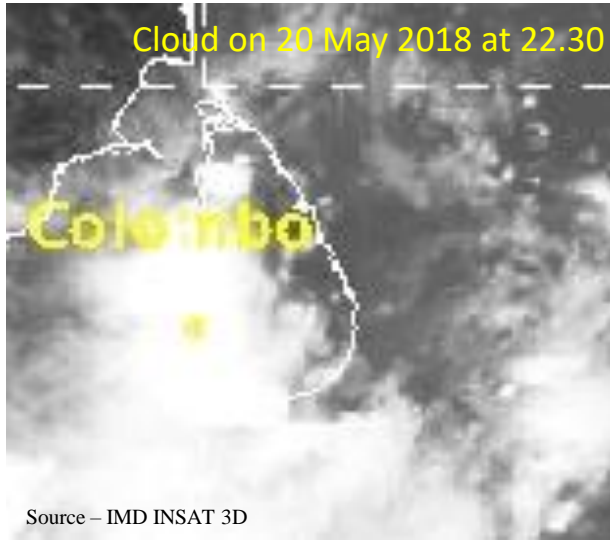
According to the Disaster Management Center (DMC) reports on 22nd May 2018 at 10.00hrs, totally 84943 peoples have been affected while 10 casualties reported so far.



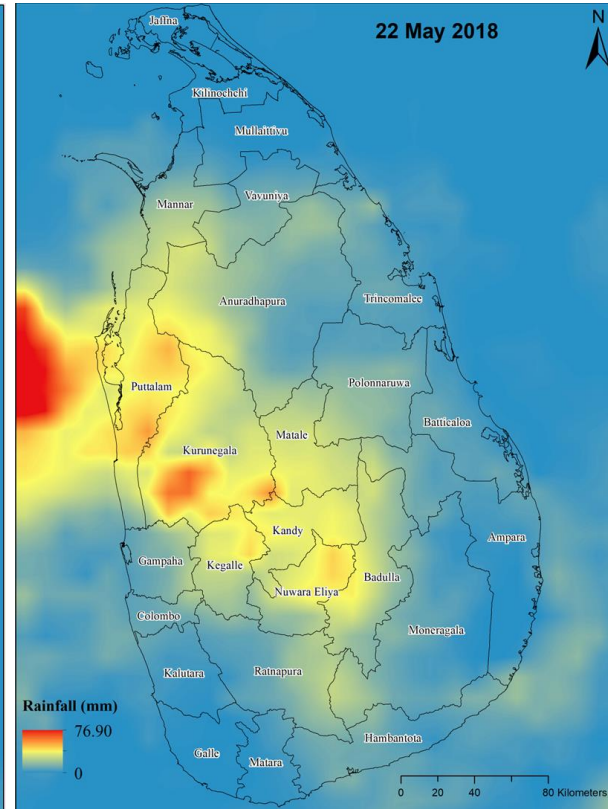
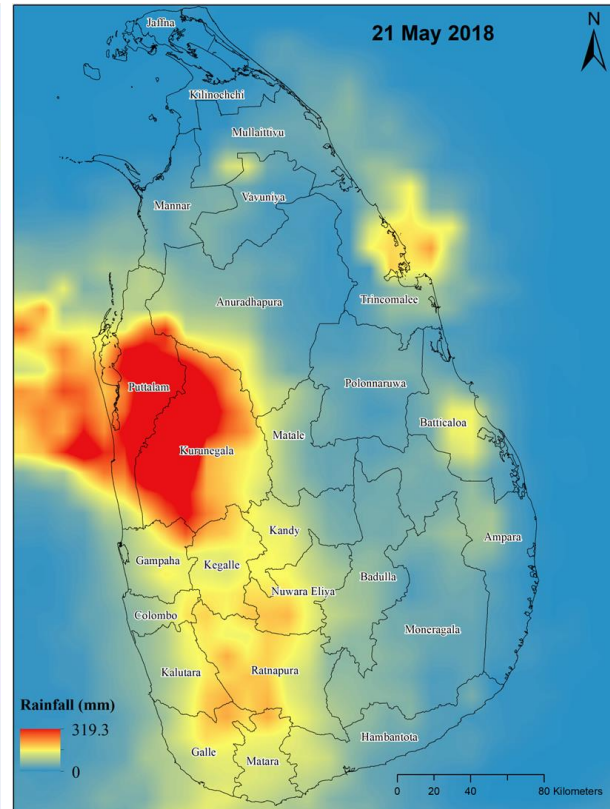
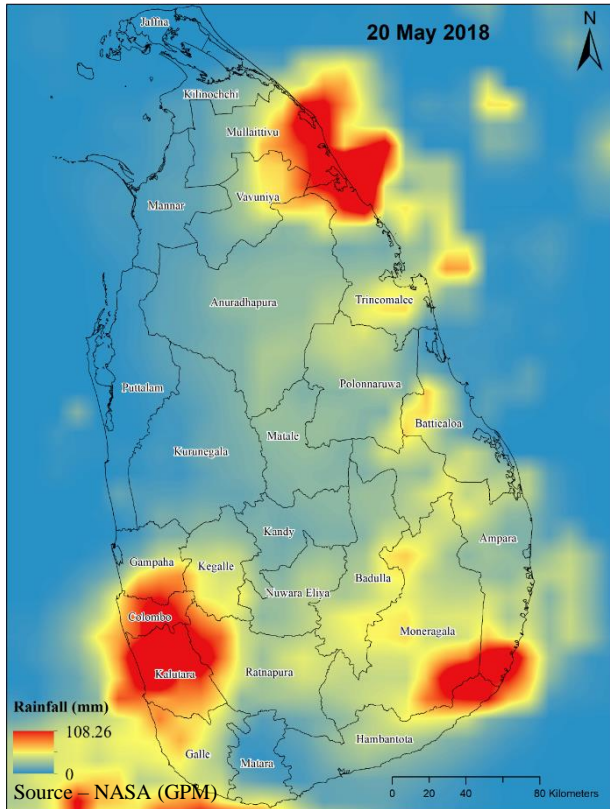
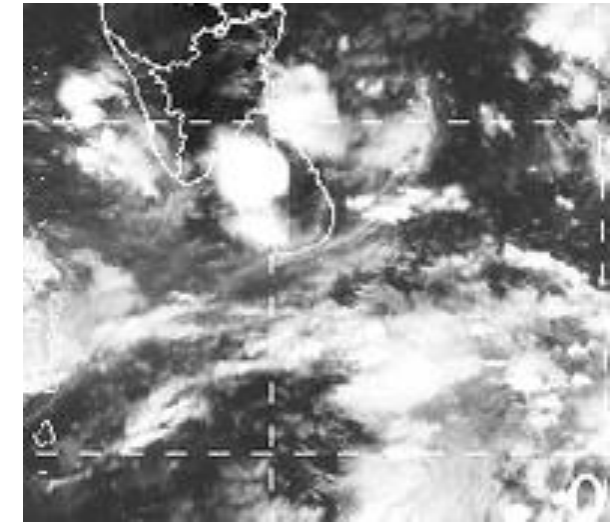
Accumulated rainfall of 22 May 2018



FLOOD MONITORING USING SATELLITE RAINFALL ESTIMATION SRI LANKA IN 2018

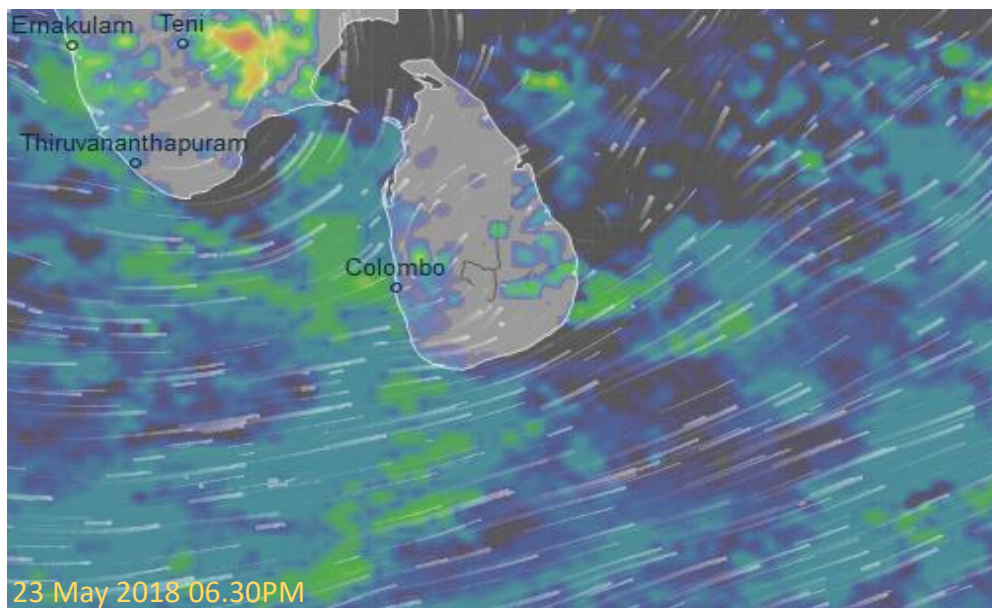


Development of cloud in
23 May 2018 09.30-09.57

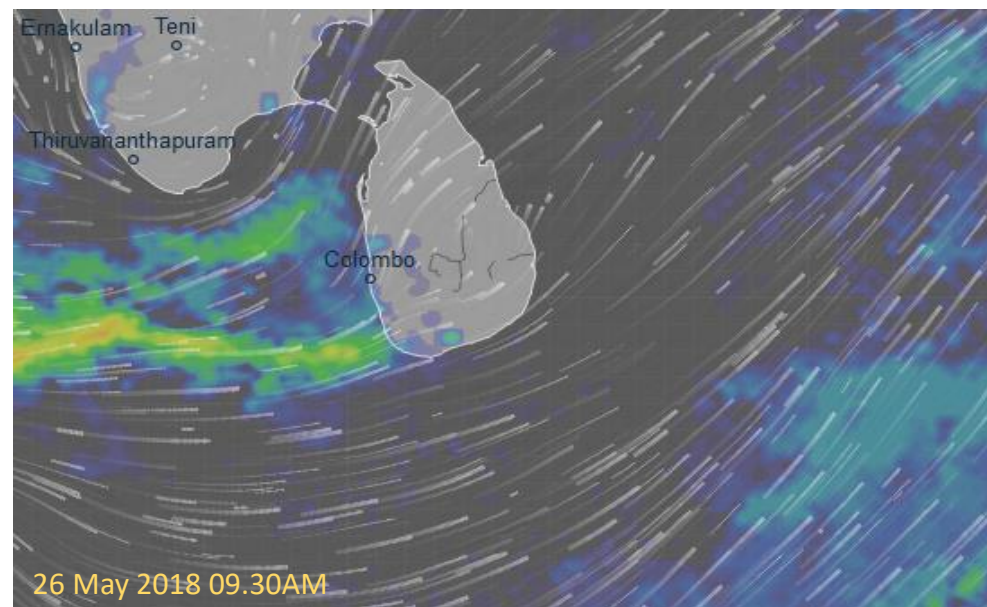
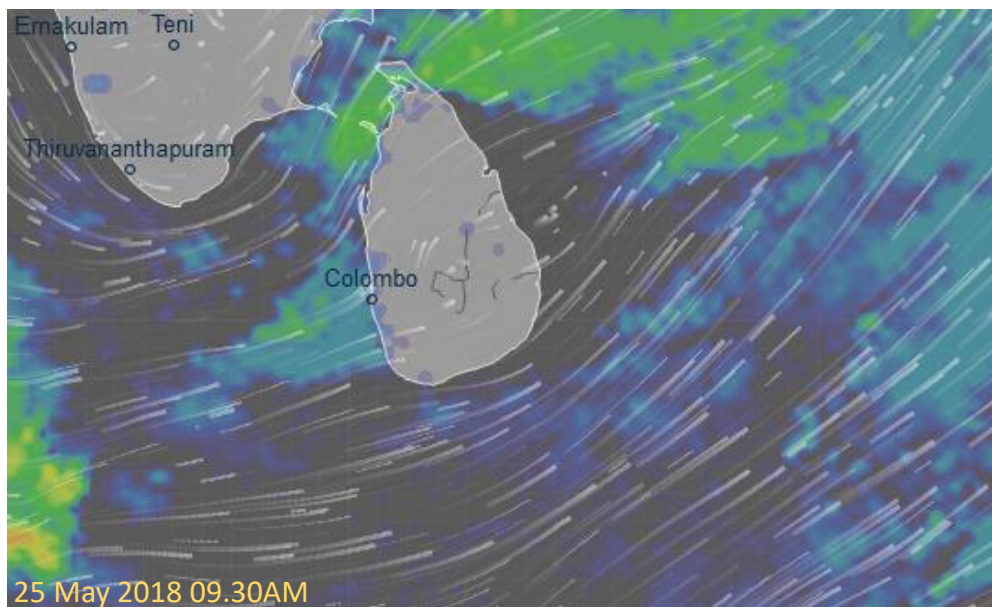
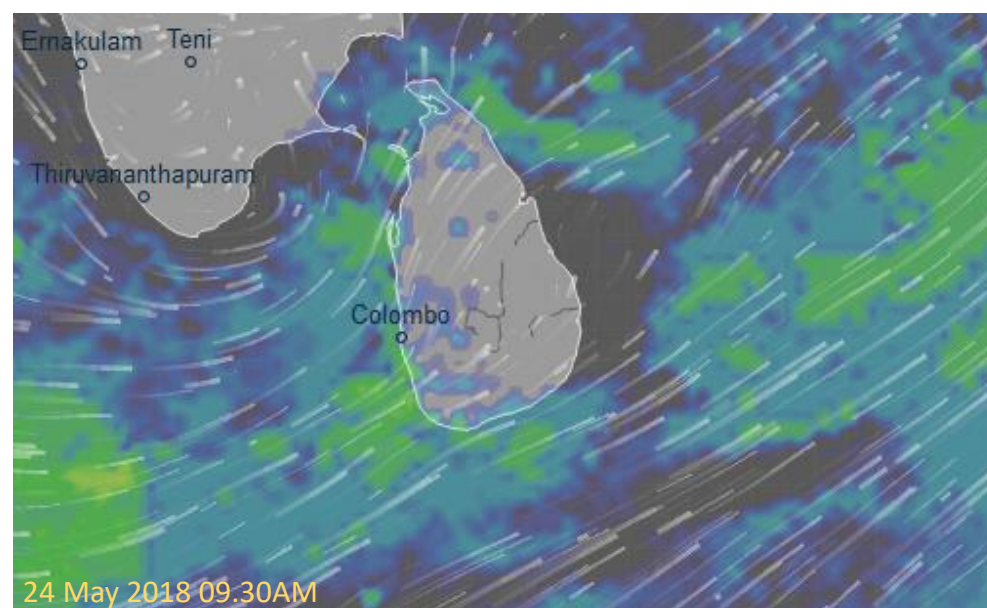


FLOOD MONITORING USING SATELLITE RAINFALL ESTIMATION SRI LANKA IN 2018

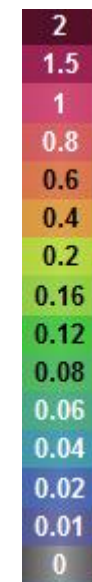
Current rainfall estimation



Future rainfall estimation

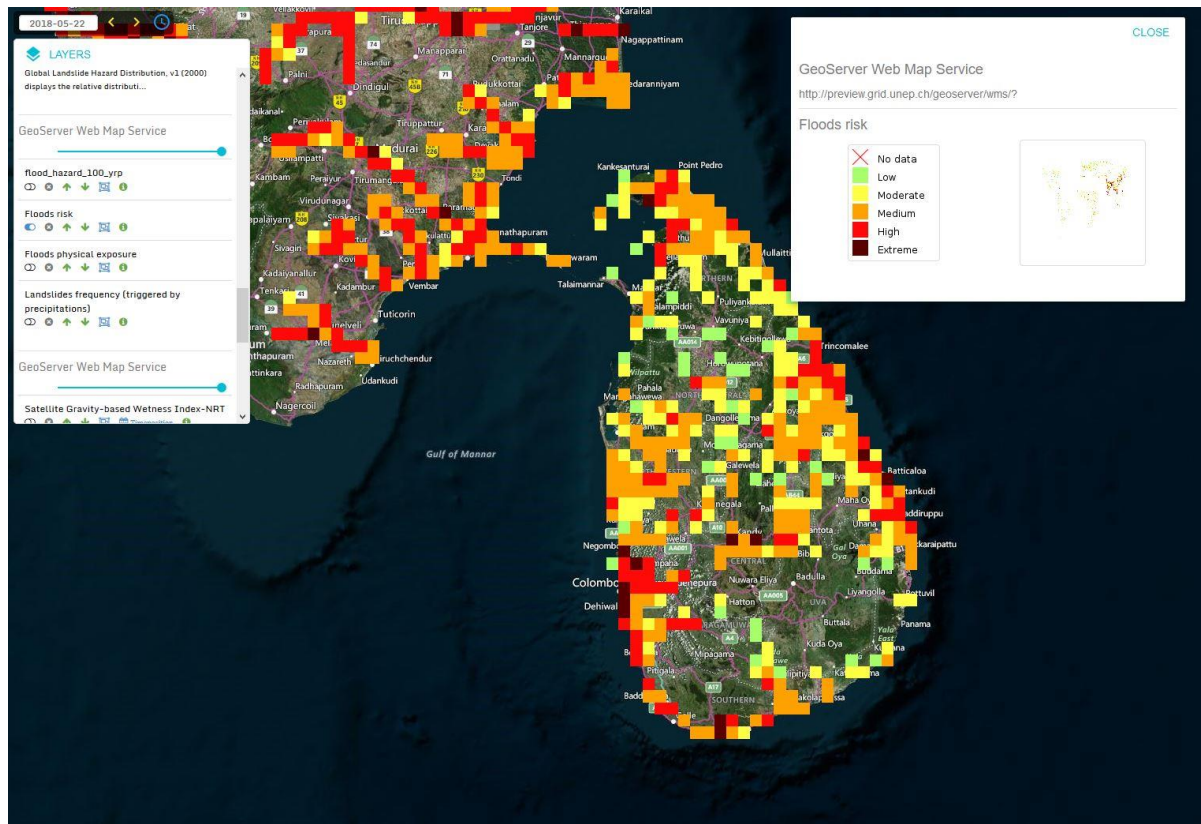


Rain in Inch

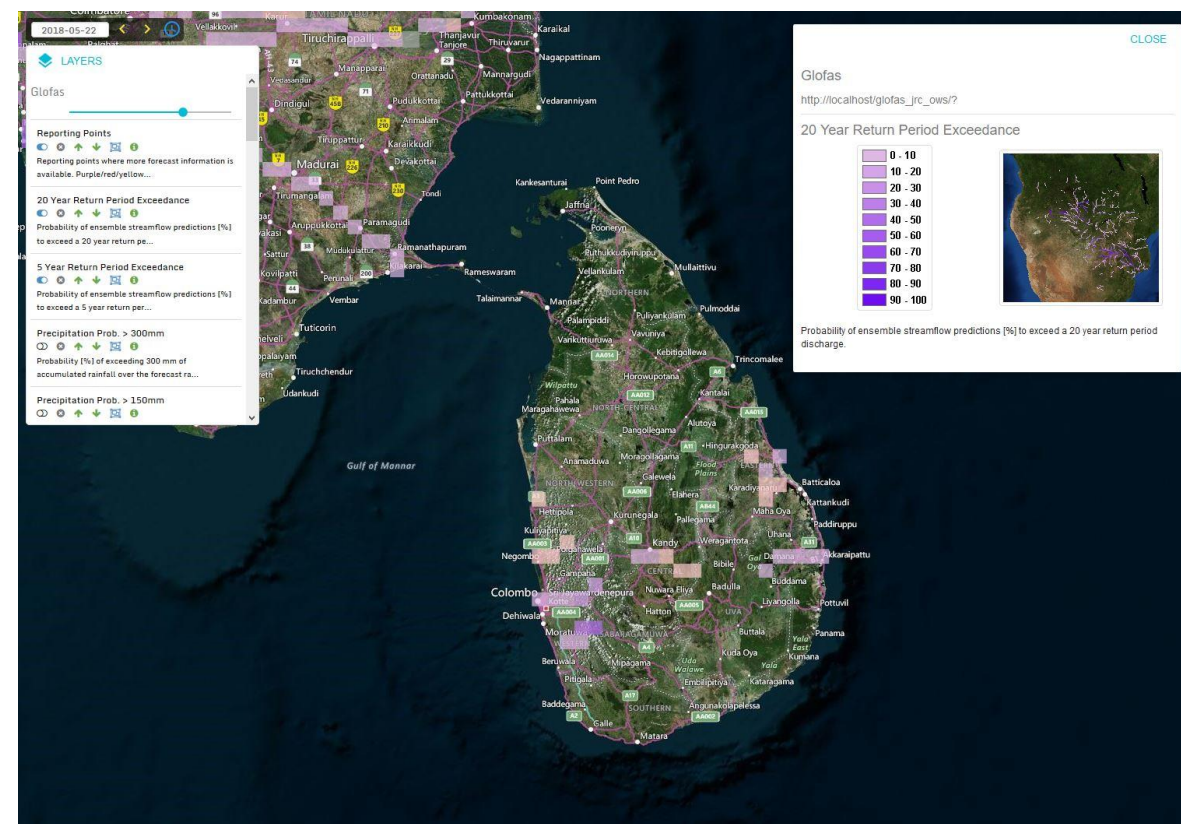


FLOOD MONITORING AND FORECAST SRI LANKA IN 2018

GloFAS Predicted Flood Risk Map with Moderate to High Flood Category



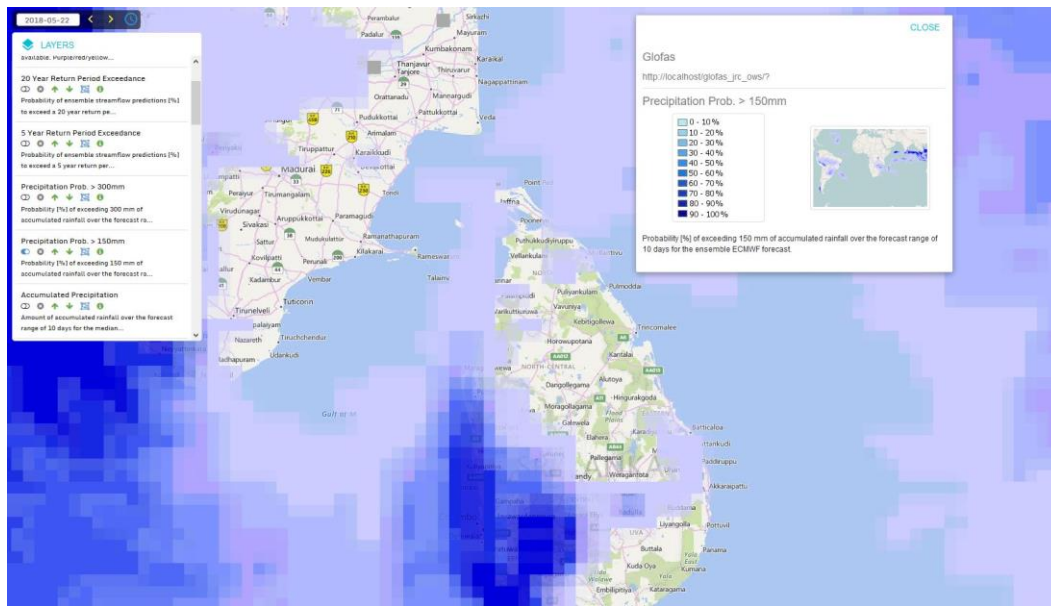
GloFAS 20yr Flood Return Period Exceedance limit



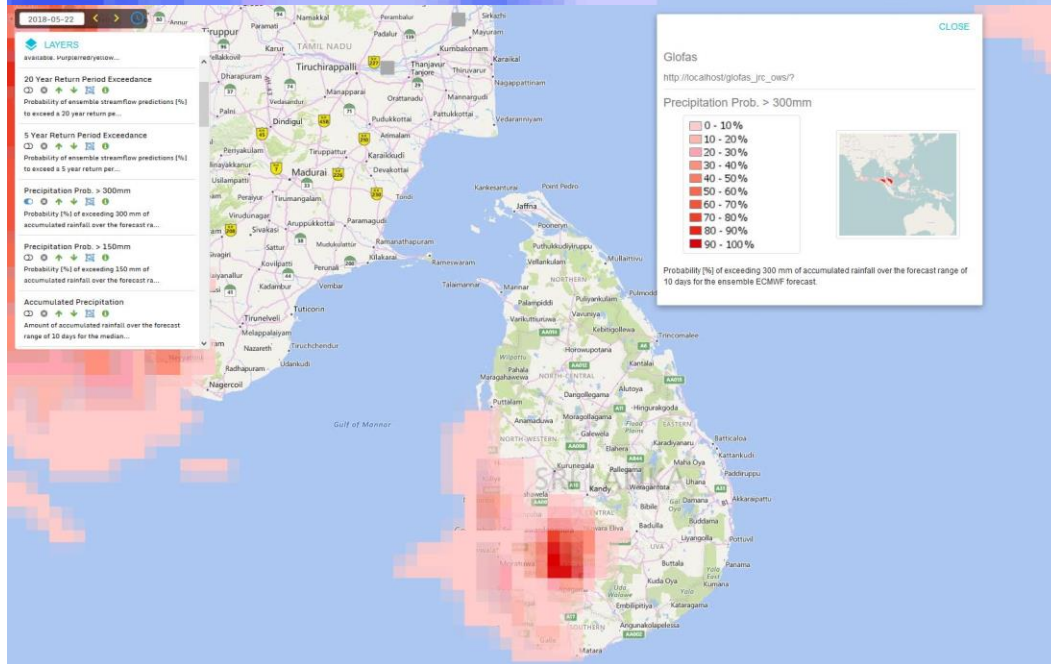
Source: Joint Research Centre / European Commission

Note : ECMWF ensemble predictions in GloFAS show a medium to high probability to exceed 300mm of rain within the next 10 days affecting mostly the south western part of Sri Lanka (see attached GloFAS screenshots GloFAS_Precip_Prob_300mm ; GLOFAS_Precip_Prob_150mm; GloFAS_Precip_accum). GloFAS river flow forecast predict a low to medium probability to exceed a 20 yr return period river flow (Also see attached GloFAS screenshot GloFAS_20yr_returnperiod_exceedance) possibly affecting Colombo and surrounding areas where the flood risk according to the Global Assessment Report (GAR) is high (see GAR_Flood_risk). Note that GloFAS is uncalibrated in this region due to the lack of hydrologic observations!

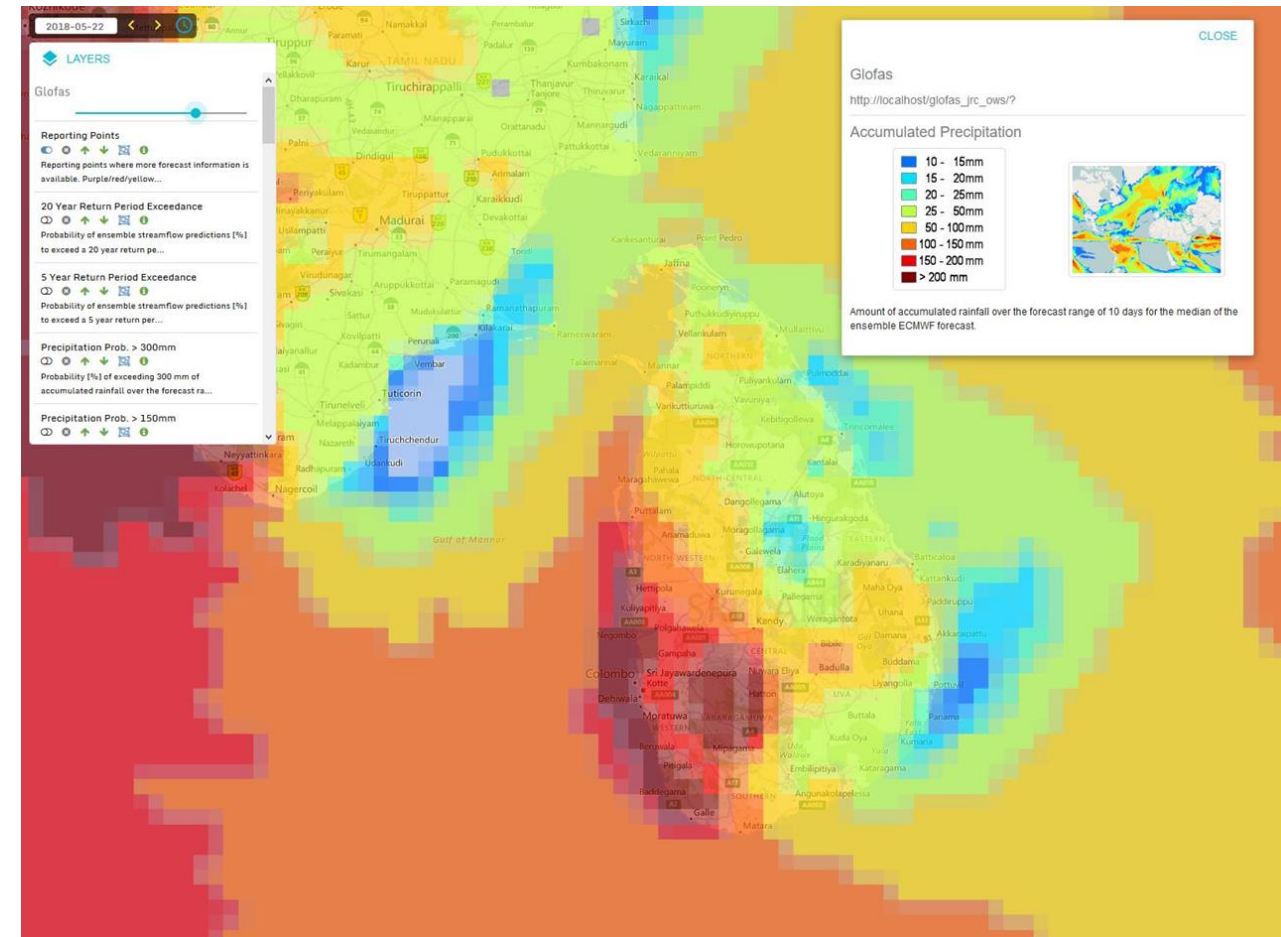
FLOOD MONITORING AND FORECAST SRI LANKA IN 2018



GloFAS Precipitation Probability over 50mm

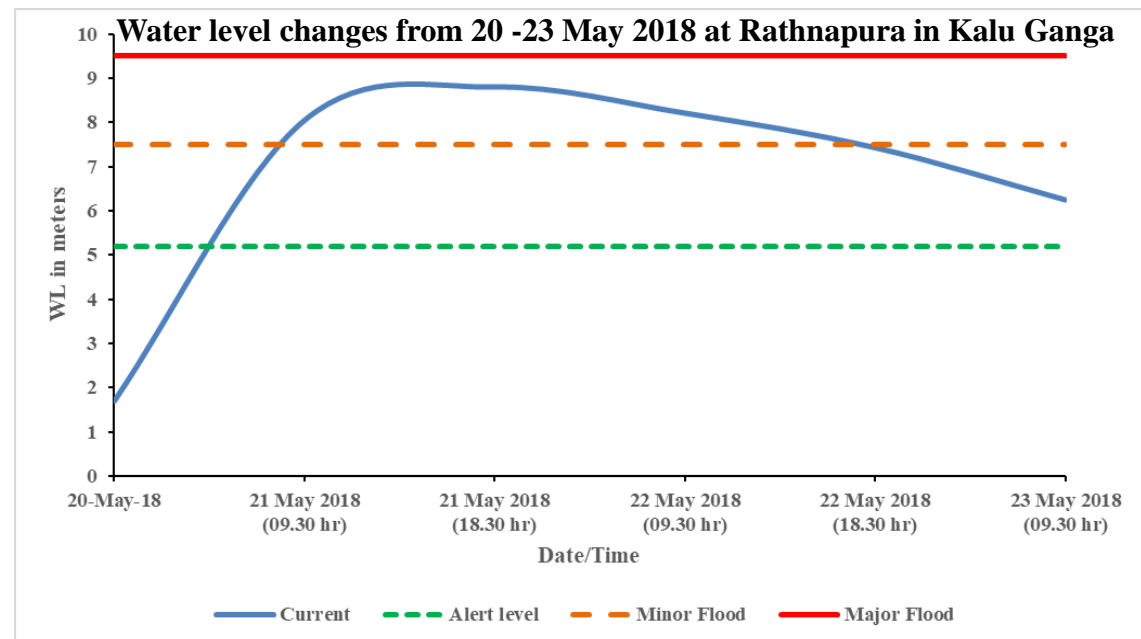
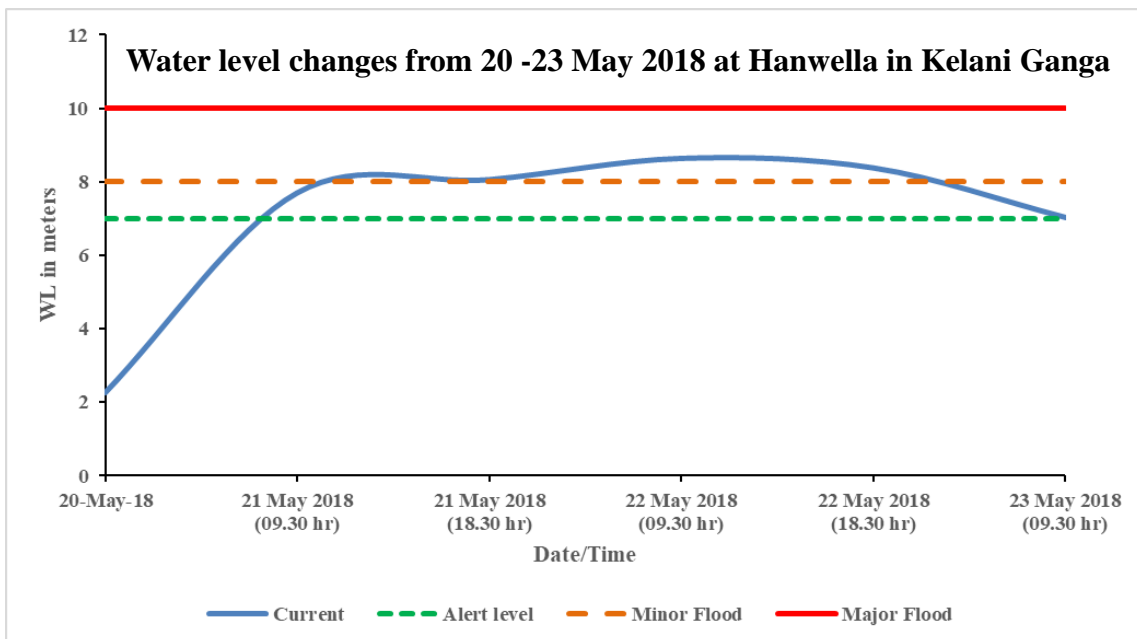
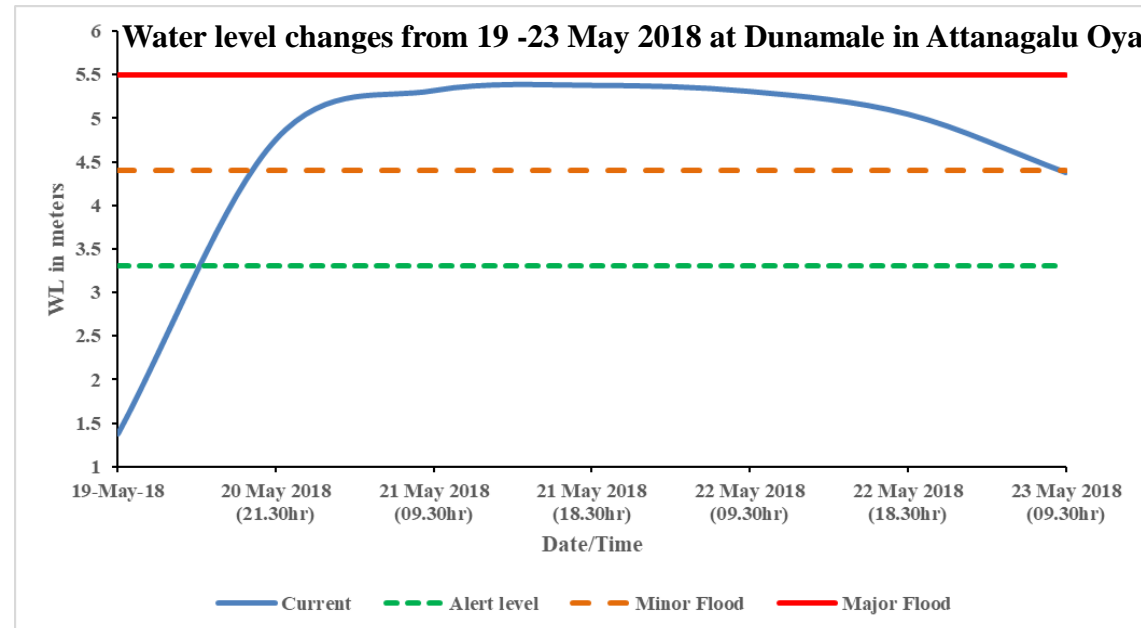
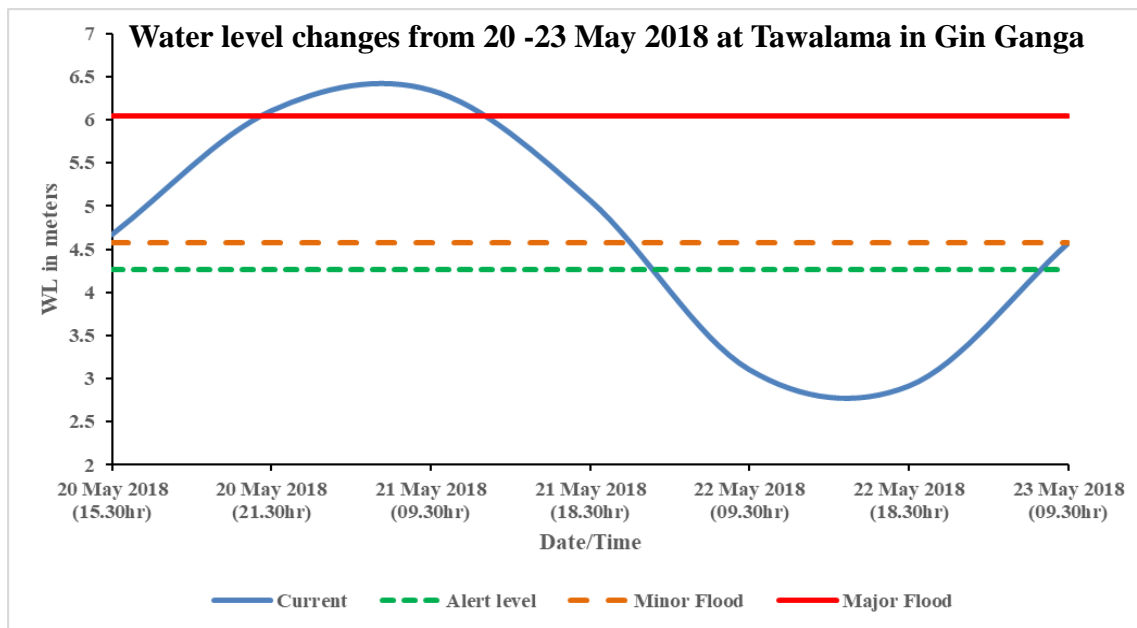


GloFAS Precipitation Probability over 300mm



GloFAS Accumulated Precipitation using Ensemble ECMWF Forecast Data

FLOOD MONITORING USING GAUGE WATER LEVEL DATA SRI LANKA IN 2018



FLOOD MONITORING USING GAUGE RAINFALL DATA SRI LANKA IN 2018

District-wise Gauge Rainfall Data

Stations	RF (in mm)
Anuradhapura	1.7
Badulla	26.2
Bandarawela	21.5
Baticaloa	1.3
Colombo	9.3
Galle	22.7
Hambanthota	1.9
Jaffna	0
Moneragala	10.5
Katugasthota	47
Katunayake	34.3
Kurunagala	98.3
Maha Illuppallama	8.8
Mannar	TR
Polonnaruwa	18.3
Nuwara Eliya	58.5
Pothuvil	0
Puttalam	87.1
Rathmalana	24
Rathnapura	181.3
Trincomalee	9.6
Vavuniya	0
Mattala	2.6

Reservoir Gauge Rainfall Data

Stations (Reservoir)	RF (in mm)
Castlereigh	95.4
Norton	166
Maussakele	113
Canyon	130
Lakshapana	18
Upper Kotmale	89
Kotmale	98.5
Victoriya	12.3
Randenigala	1.5
Rantambe	1
Bowatenna	5.2
Ukuwela	25.2
Samanala Wawa	35
Kukuleganaga	227
Maskeliya	135.8
Neboda	NA

Other Rainfall Station

Station Name	RF (in mm)
Anamaduwa	353.8
Andigama	339
Thamankaduwa	316
Kamalasram	302
Mathale-PWD	267.5
Kudawe	232.6
Kuliyapitiya	232.5
Horagasgara	232
Dummalasooriya	217.4
Delwala Tea	203.5
Dampalessa	196.8
Poddiwela Farm	190.8
Niwithigala Tea	190.8
Kuttapitiya Tea	174.6
Nikaweratiya	168.4
Mellawa	167.2
Batuwangala	163
Warakapola	162.8
Benthotawatta	161.3
Palugaswewa Estate	161

Data source – Department of Meteorology Sri Lanka (Data received on 23 May 2018)