FLASH FLOOD CASE STUDY
INDIA

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India Meteorological Department
Follow-up Operations Workshop
South Asia Flash Flood Guidance System
5 – 7th June 2018
New Delhi, India
CONTENT

1. Introduction
2. Synoptic Conditions
3. Case Study
4. Conclusion
ACTIVE MONSOON SEASONS

• SOUTHWEST MONSOON
  (JUNE TO SEPTEMBER)

• NORTHEAST MONSOON
  (OCTOBER TO DECEMBER)
29th AUGUST 2017

Associated Synoptic situation

Low pressure Area and associated cyclonic circulation:

• On 29th August, a well-marked low pressure area lay over southwest Madhya Pradesh & neighbourhood and on 30th it lay over northern parts of Saurashtra and adjoining Gujarat region. The associated upper air cyclonic circulation extended up to 7.6 km above sea level titling southwestwards with height.

• Offshore Trough:
Another aiding factor for this extreme rainfall was an offshore trough at mean sea level running from south Maharashtra coast to north Kerala coast on 29th August, which was seen off Karnataka - Kerala coast on 30th August.
Satellite Images – 28th and 29th Aug
Merged Mean Areal Precipitation 29th Aug - 00UTC

MAP - 06 hr

2017-08-29 00:00 UTC

INDIA

MAP - 24 hr

2017-08-29 00:00 UTC

INDIA
Merged Mean Areal Precipitation 29th Aug - 06UTC

MAP - 06 hr
2017-08-29 06:00 UTC
INDIA

MAP - 24 hr
2017-08-29 06:00 UTC
INDIA
FORECAST 29th Aug - 00UTC
FORECAST 29th Aug - 06UTC
Average Soil Moisture 29th Aug – 00 & 06 UTC
Flash Flood Threat 29th Aug - 00UTC
Flash Flood Threat 29th Aug - 06UTC
Flash Flood Risk 29th Aug - 06UTC
MAPSERVER INTERFACE
ADVISORY

1) 29th August 2017 – 00 UTC valid till 06 UTC
2) 29th August 2017 – 06 UTC valid till 12 UTC

Generally, in time steps of 6 hours for next 12 hours with Watch (Be Updated) to Alert (Be Prepared) to Warning (Take Action).

Main area of concentration are Central India, West Coastal part of India
Rainfall (in mm) received over different stations in Mumbai on 30/08/2017 (SAFAR AWS Network)
As rain subsides, Mumbai floods death toll is five, 12 missing
RECENT CASE STUDY

29th MAY 2018
The well marked low pressure area lay over southeast Arabian sea and adjoining east central Arabian Sea off north Kerala Karnataka coasts. Associated cyclonic circulation extends upto 7.6 km above mean sea level.
MWGHE and GHE 29th May -00 UTC
MWGHE and GHE 29th May -06 UTC
Merged Mean Areal Precipitation 29\textsuperscript{th} May – 00\&06UTC
Merged Mean Areal Precipitation 29th May – 00&06 UTC
FORECAST 29th May - 06UTC
Average Soil Moisture 29\textsuperscript{th} May – 00 & 06UTC
Flash Flood Threat 29th May - 00UTC

IFFT - 06 hr  2018-05-29 00:00 UTC  REGIONAL

PFFT - 06 hr  2018-05-29 00:00 UTC  REGIONAL
Flash Flood Threat 29<sup>th</sup> May - 06UTC
Flash Flood Risk 29th May – 00UTC
ADVISORY

1) 29\textsuperscript{th} May 2018 – 00 UTC valid till 06 UTC
2) 29\textsuperscript{th} May 2018 – 06 UTC valid till 12 UTC

Generally, in time steps of 6 hours for next 12 hours with **Watch (Be Updated)** to **Alert (Be Prepared)** to **Warning (Take Action)**.

Main area of concentration is Coastal Karnataka.
## Rainfall Observation on 30th May’18

### District: Dakshina Kannada

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### District: Udupi

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Mangaluru: Heavy downpour leaves city in a shambles

Major areas that saw inundation were Kodiaiguthu, Kottara Chowki, PVS, Kadri Kambala, Panjimoguru, Adyar, Yeekuru and other areas. Most of the roads in the city were ankle deep water due to either drains being full or lack of drains.

MANGALURU: Torrential rains that lashed that the city on Tuesday morning inundated most of the low lying areas in the city. The rains which started at 9am left the city in a shambles with the steady drizzle turning to a downpour by mid-afternoon. Many low lying areas in the city witnessed artificial flooding and water entered many compounds – making it difficult for residents to venture out or come in.

South west monsoon: Heavy rains lash Mangaluru, schools to be closed tomorrow

MANGALURU: The south west monsoon had hit the Karnataka coast earlier than usual. Mangalore and areas around it have been receiving heavy rains since Monday night. Although there was a sigh of relief for the locals during the early hours of Tuesday, there has been unabated rainfall since 9:30 am, according to a report by The Hindu. Various low-lying areas including Kottara Chowki and Ballal Bagh experienced waterlogging on Day 1 of the season.

One Air India, one SpiceJet and one Air India Express was diverted from Karnataka’s Mangalore airport due to rain and poor visibility. Air traffic control (ATC) says ‘it will improve soon’. Rescue operations are underway in Mangalore’s Panambur as streets got water-logged following pre-monsoon rains.

The Mangaluru Central Railway Station and the adjacent Railway Mail Service office were completely inundated with rainwater and overflowing sewage.
Acknowledgments

• World Meteorological Organisation
• Hydrologic Research Centre, San Diego, United States
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• Upper Air Instrument Division, India Meteorological Department, New Delhi
• Satellite Meteorology Division, India Meteorological Department, New Delhi
• Surface Instrument Division, CRS, Pune
• Regional Meteorological Centre, Mumbai
• Meteorological Centre, Bangaluru