

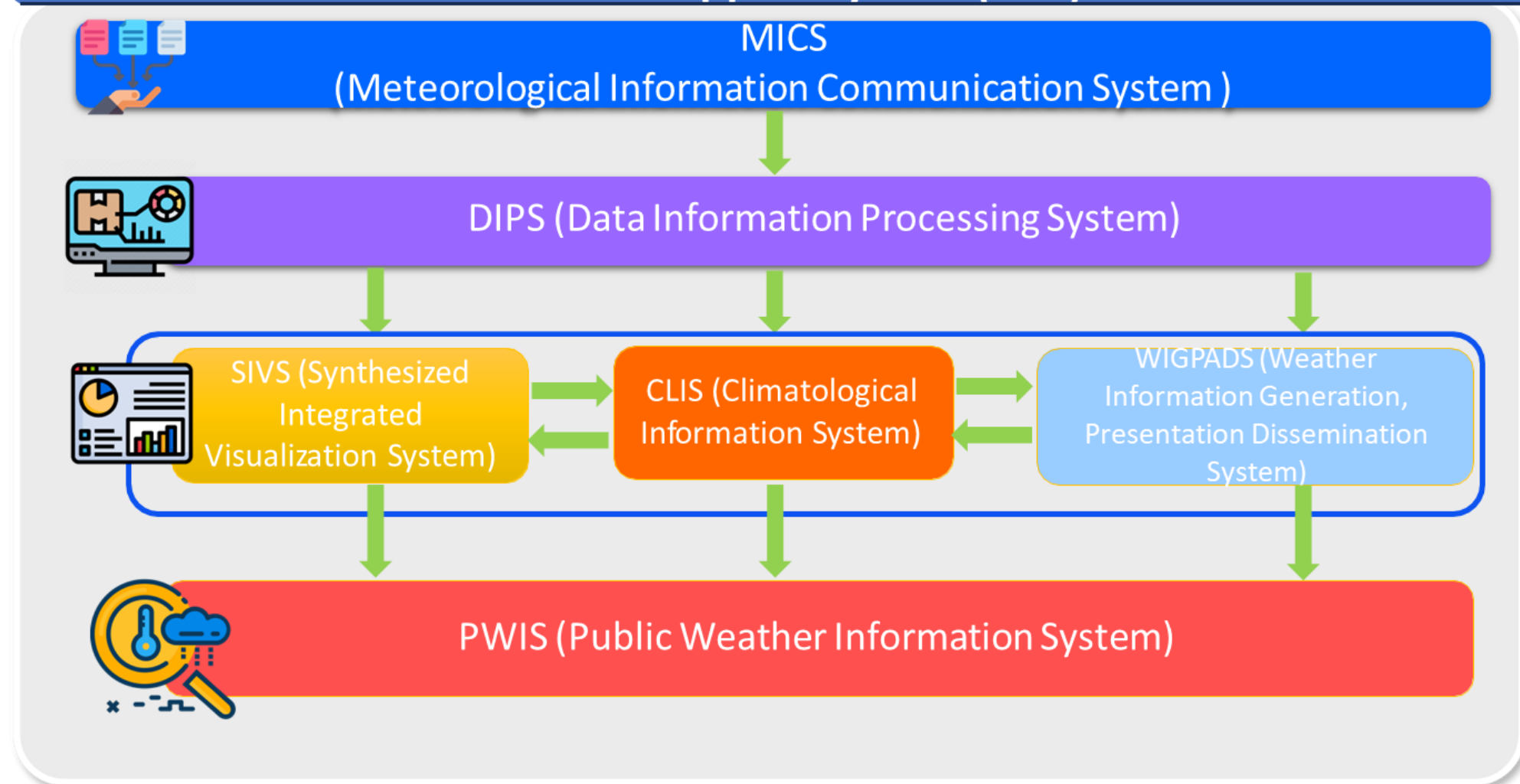


Role of indigenously developed decision support system of India Meteorological Department in understanding and prediction of monsoon circulation and associated severe weather over Indian region

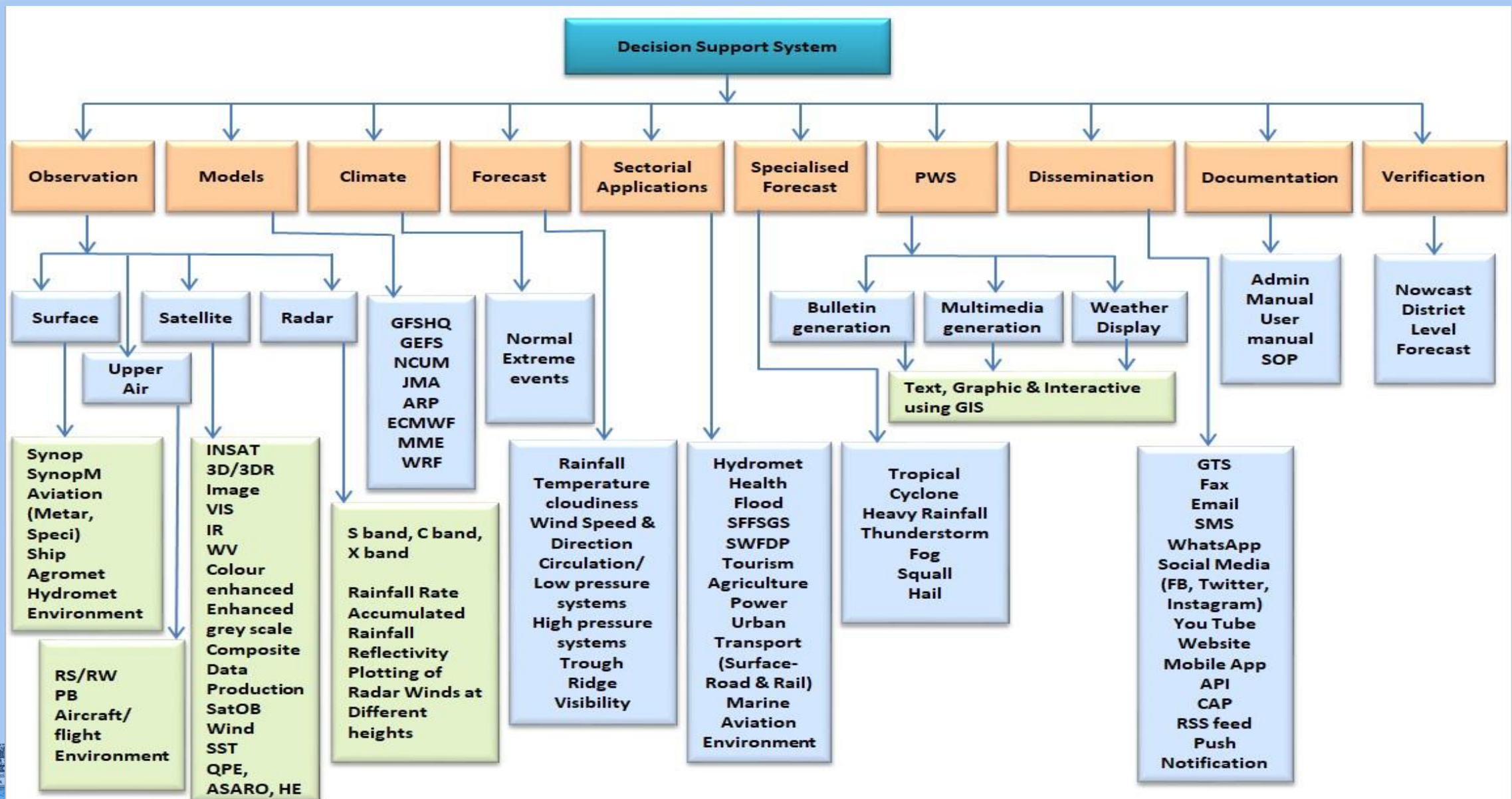
Suman Gurjar, Anshul Chauhan, Kuldeep Srivastava, Muthukumarasamy Iyyappan, Mrutyunjay Mohapatra & DSS team



Weather Analysis and Forecast Enabling System (WAFES) Decision Support System (DSS)



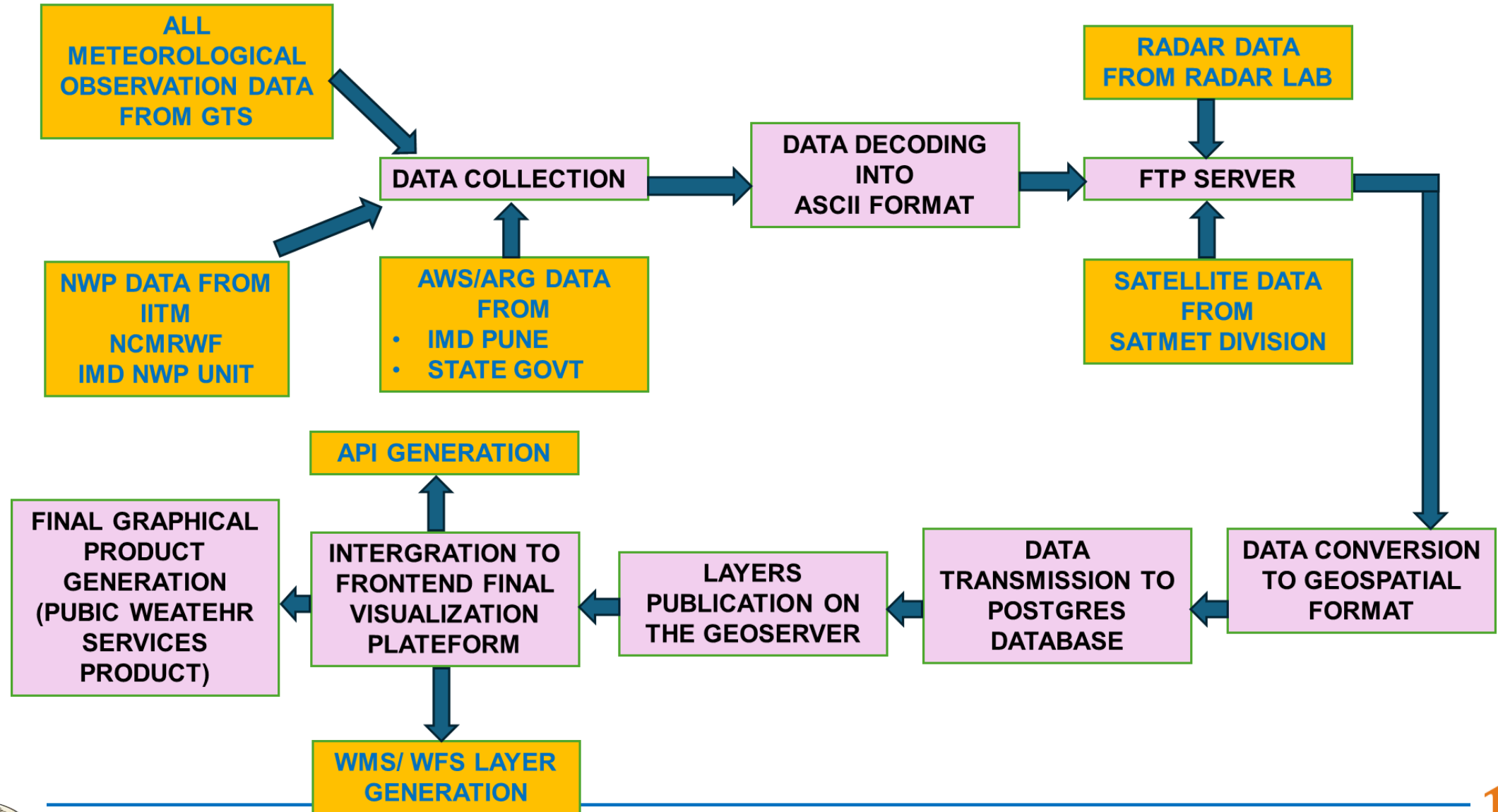
Dataset and Components of DSS



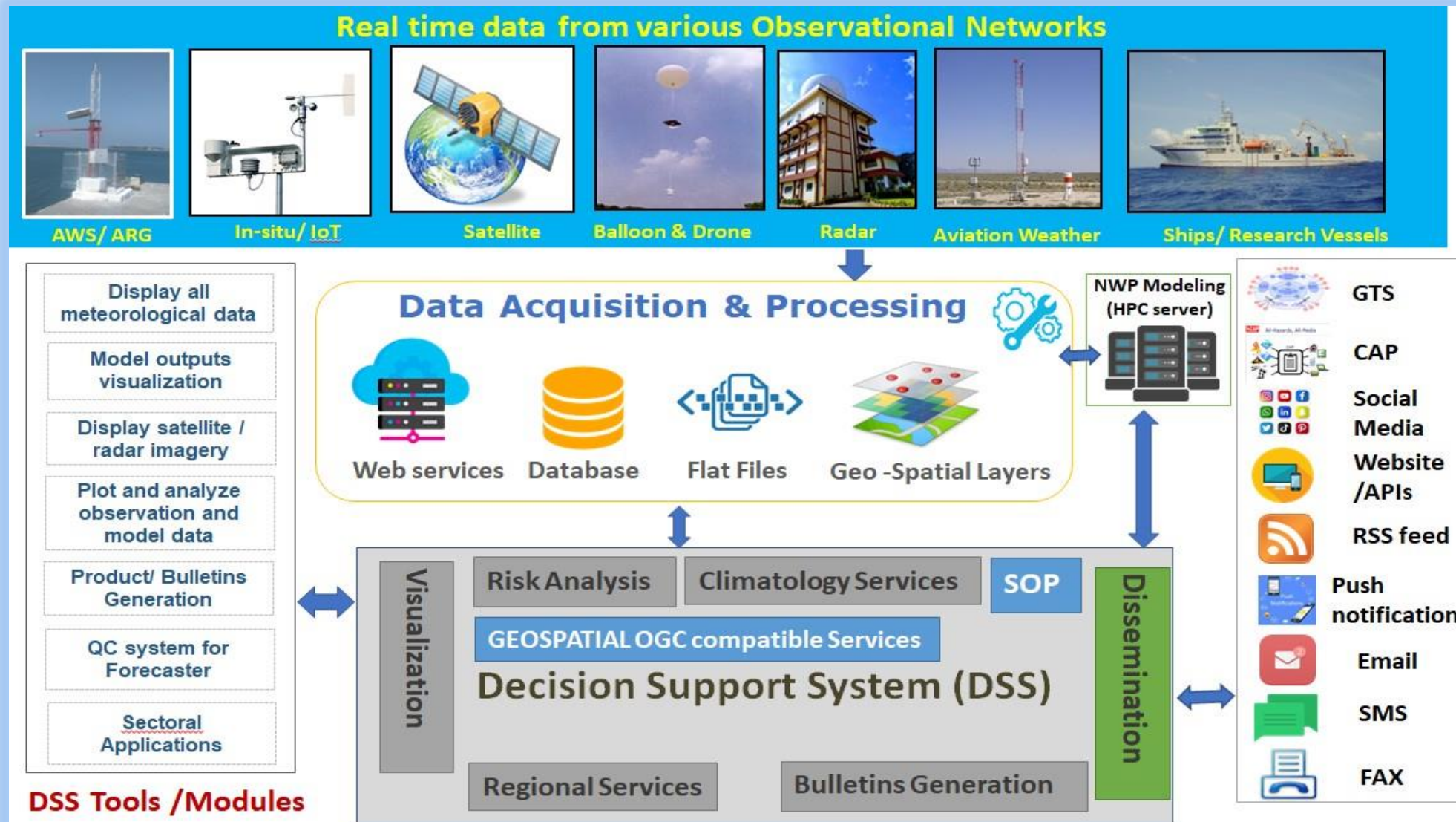
Information Management



MICS – Data Communication

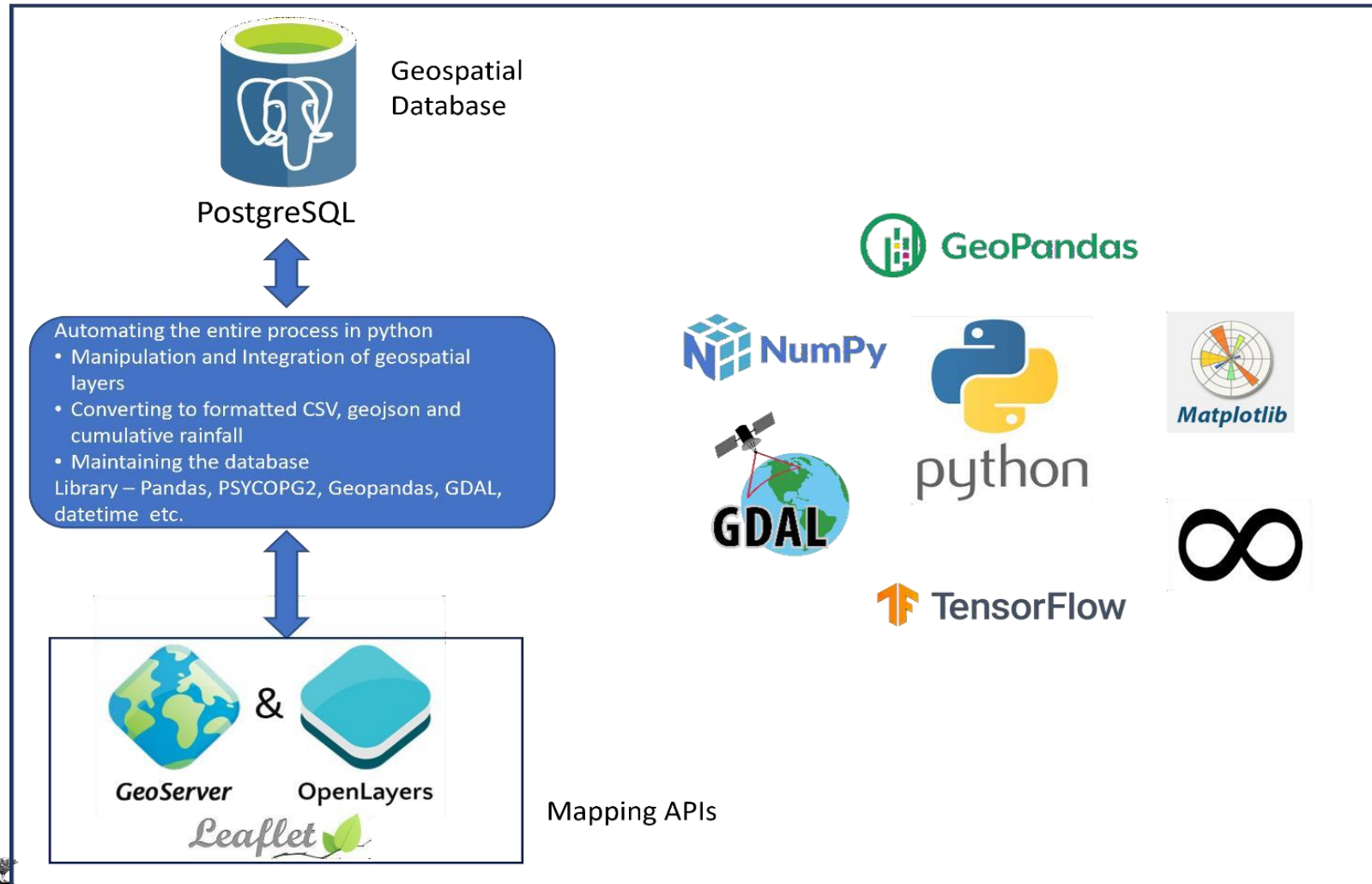


High Level architecture for Decision Support System



Tools and technologies

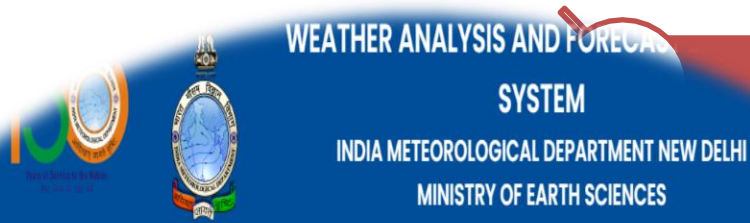
Back-End



Front-End



Major Functionalities



Geovisualization of all layers

Data Monitoring

Data processing

Data and impact analysis tools

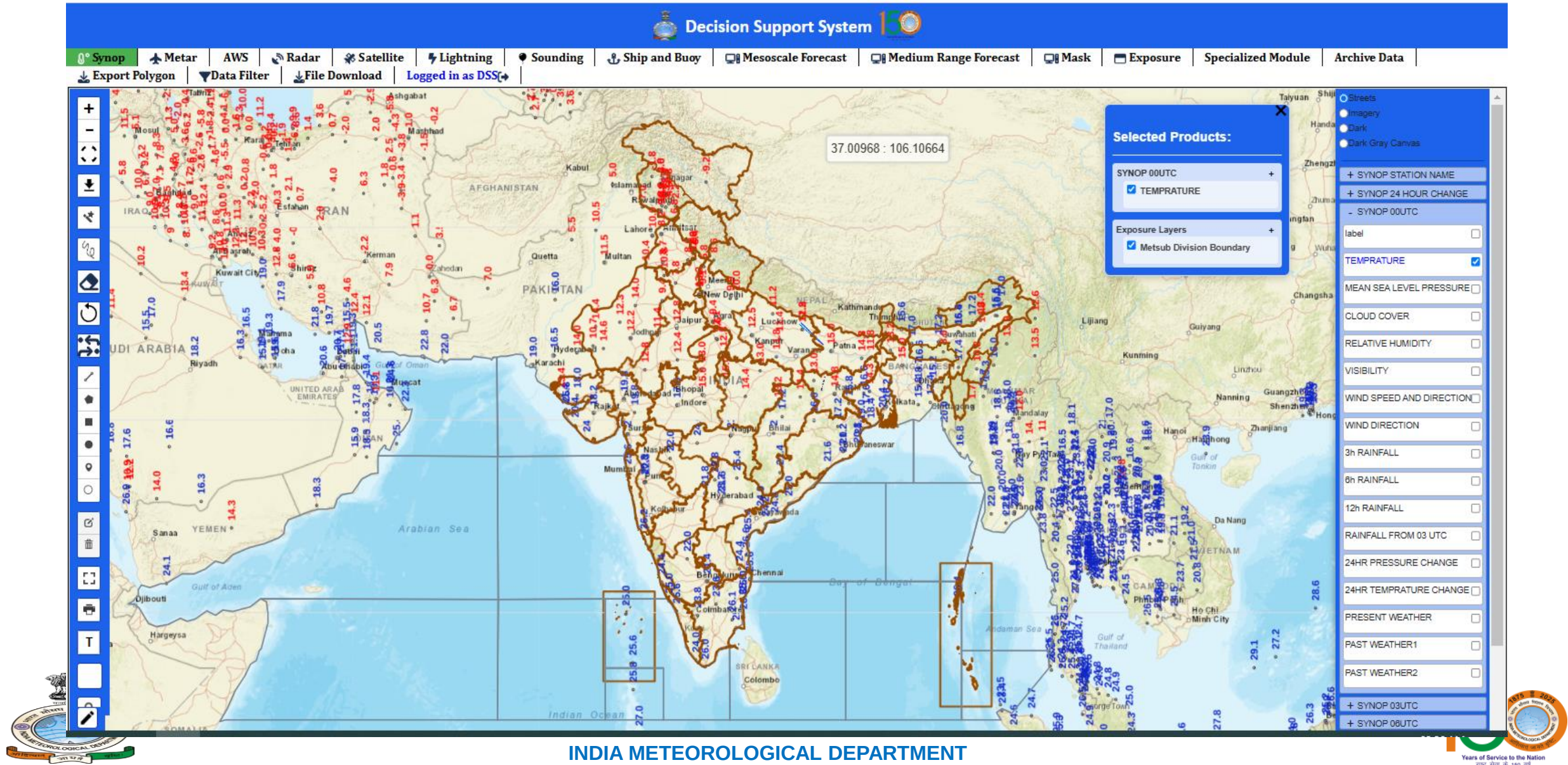
Verification of forecast

Automatic text and sms warning alerts

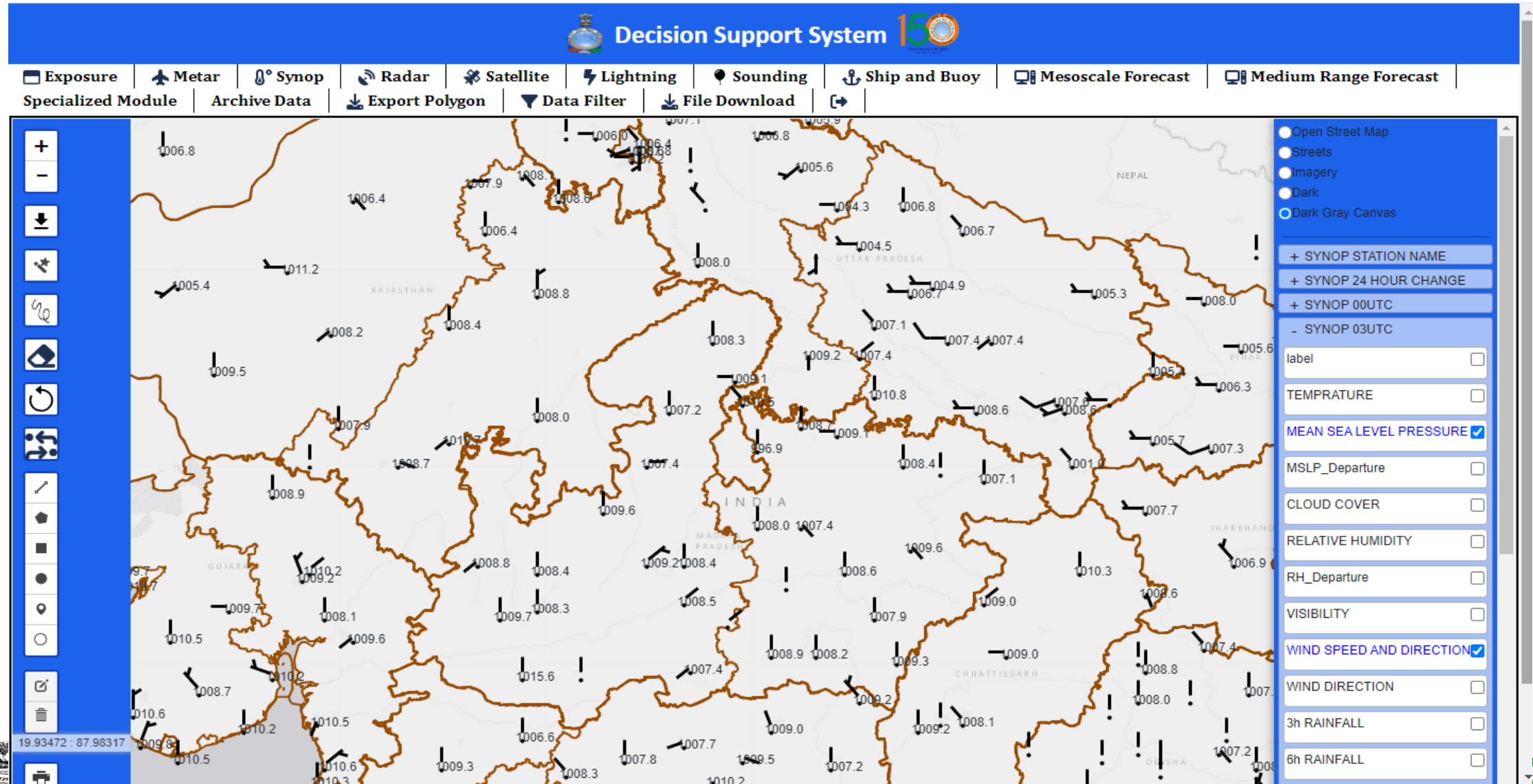
Automatic Bulletin generation



DSS for weather monitoring and forecasting



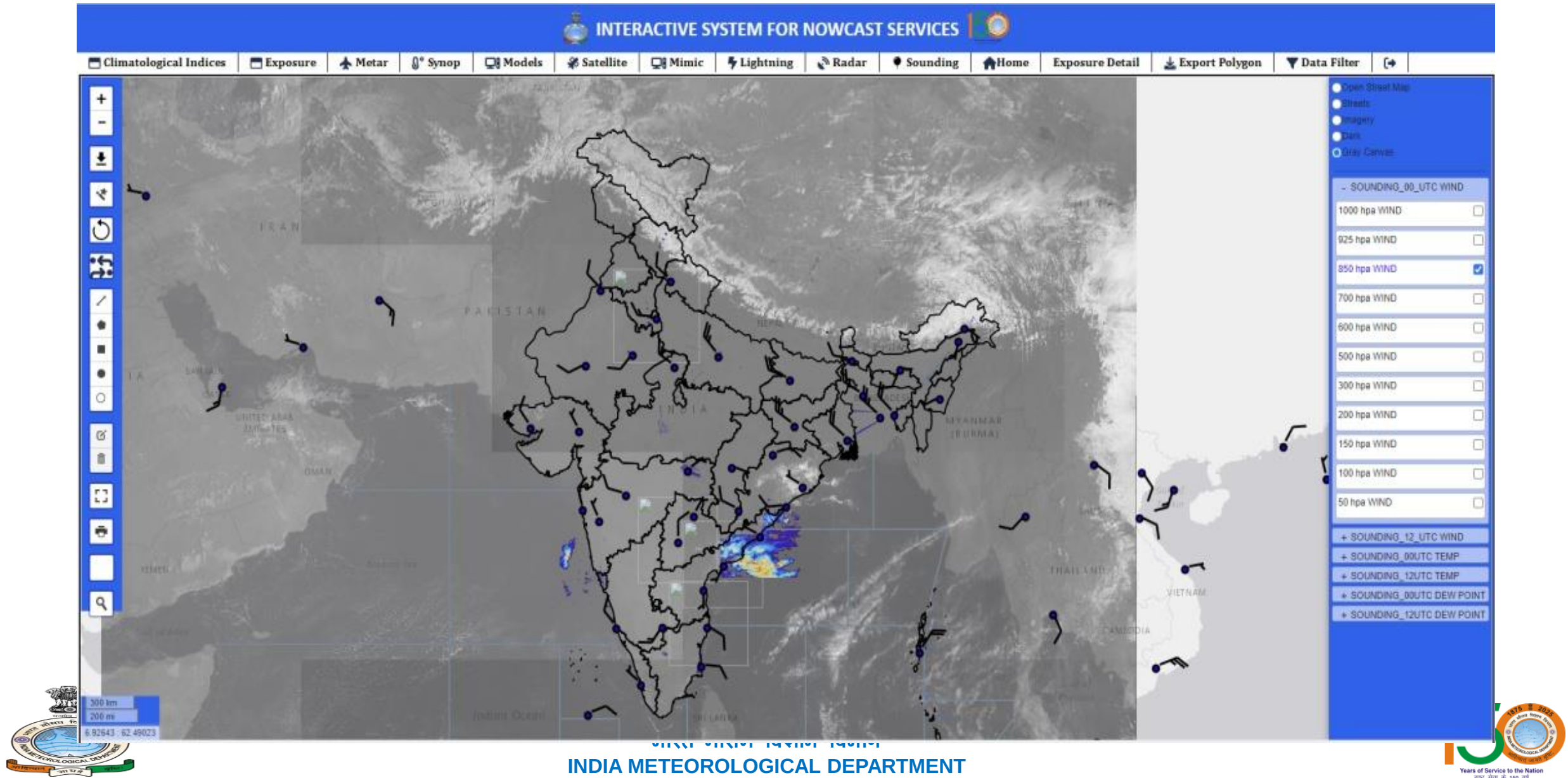
DSS Products: SURFACE CHART



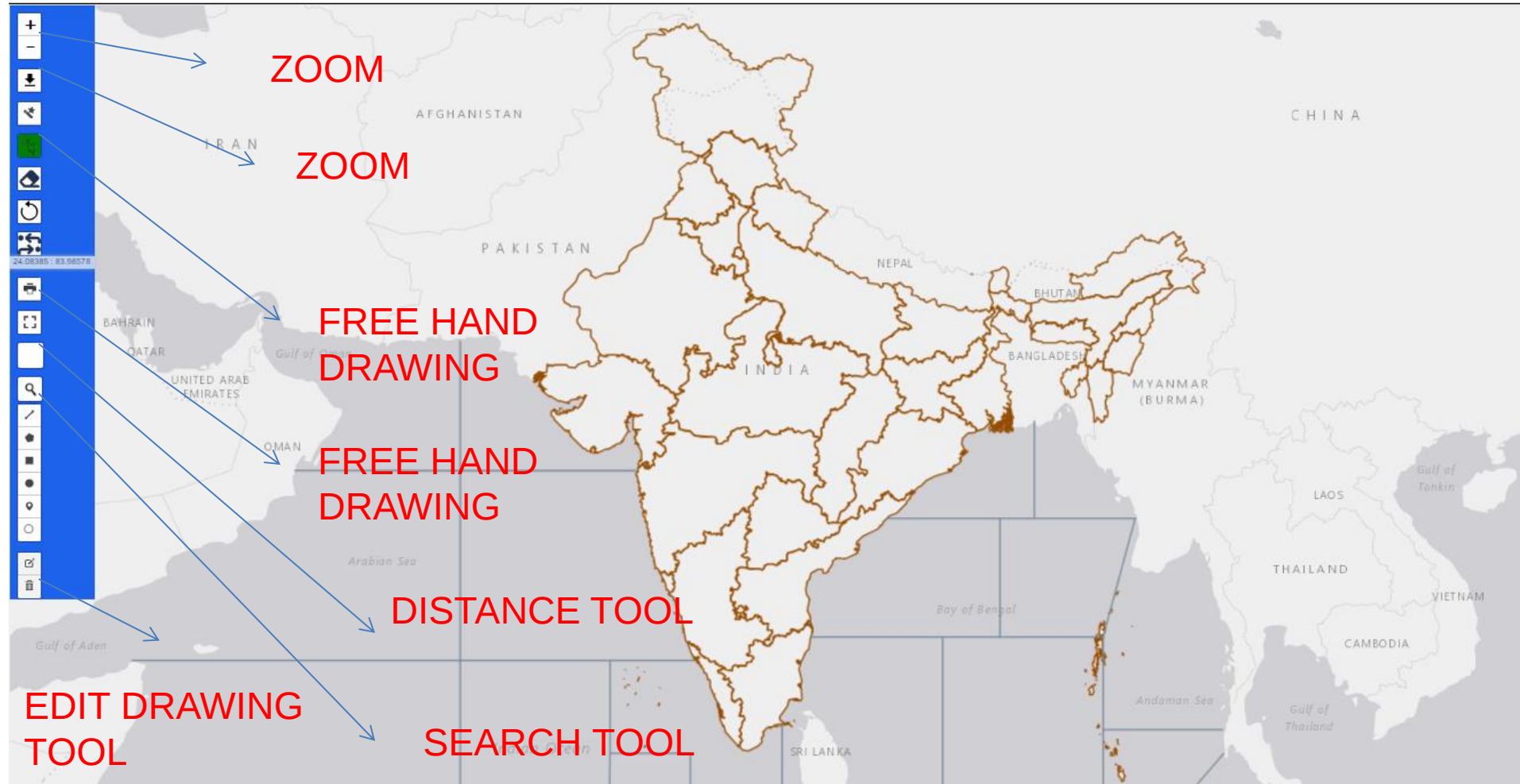
भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT



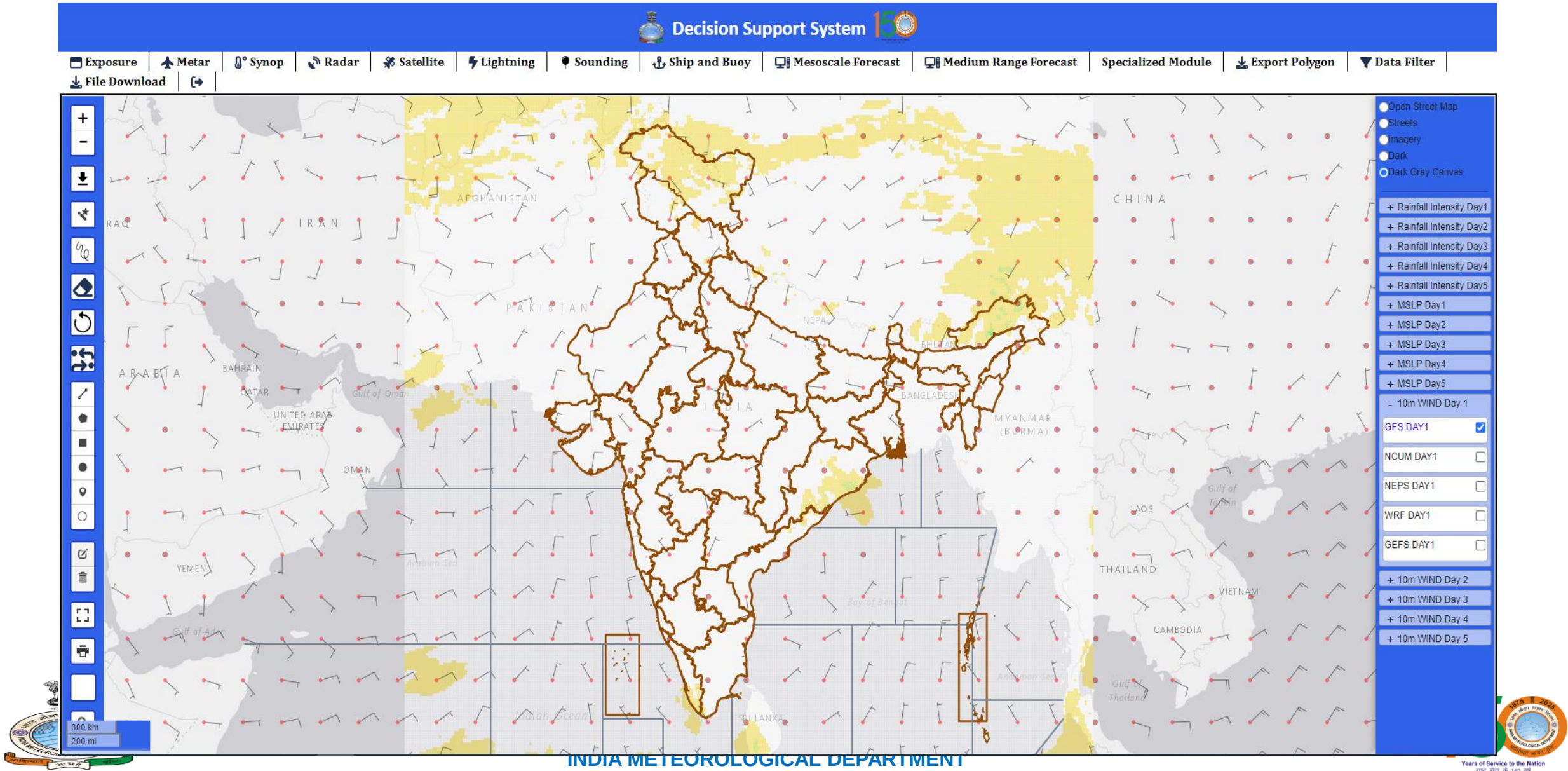
DSS Products: radar and sounding winds overlaid over satellite



DSS Products: Tools

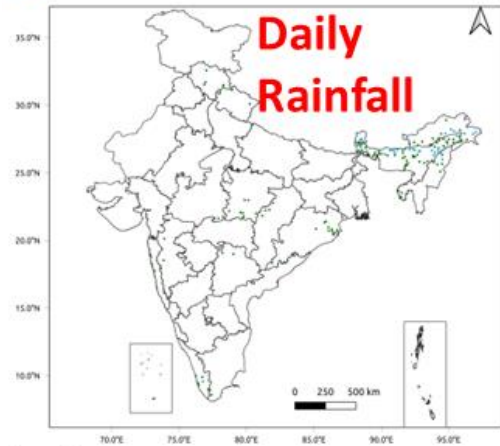


DSS Products: NUMERICAL WEATHER MODELS



DSS Products: PUBLIC WEATHER INFORMATION SYSTEM

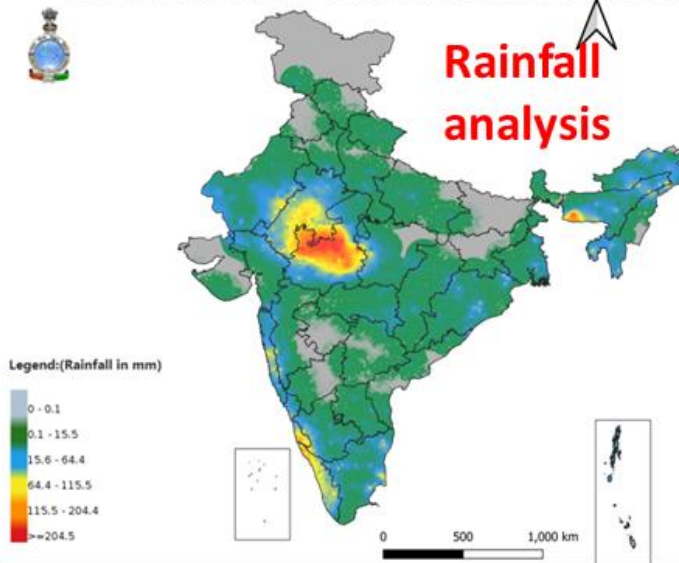
24 Hr cumulative rainfall recorded over different stations during 0830 IST of 16-4-2024 to 0830 IST of 17-4-2024



Legends

- Very Light to Light Rainfall (0.1 - 15.5 mm)
- Moderate Rainfall (15.6 - 64.4 mm)
- Heavy Rainfall (64.5 - 115.5 mm)
- Very Heavy Rainfall (115.6 - 204.4 mm)
- Extremely Heavy Rainfall (>=204.5 mm)

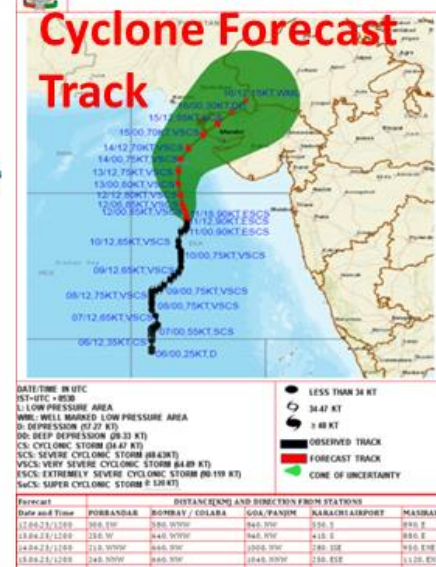
Rainfall analysis maps from 24 HR cumulative rainfall recorded over different stations during 0830 IST of 22-08-2022 to 0830 IST of 23-08-2022



Legend:(Rainfall in mm)

- 0 - 0.1
- 0.1 - 15.5
- 15.6 - 64.4
- 64.5 - 115.5
- 115.6 - 204.4
- >=204.5

OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF EXTREMELY SEVERE CYCLONIC STORM "BIPARJOY" OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC (1730 IST) OF 11th JUNE 2023.

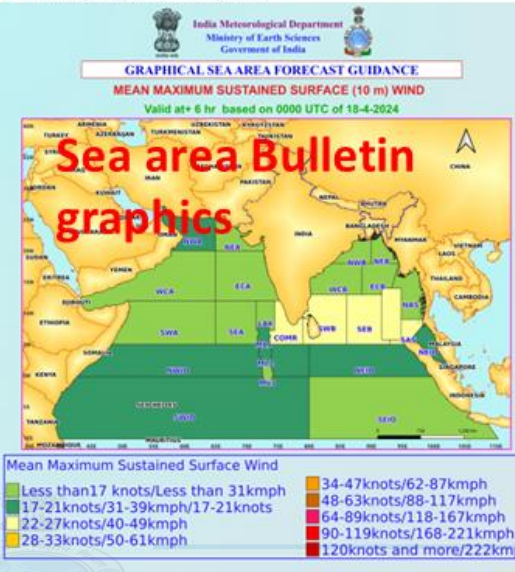
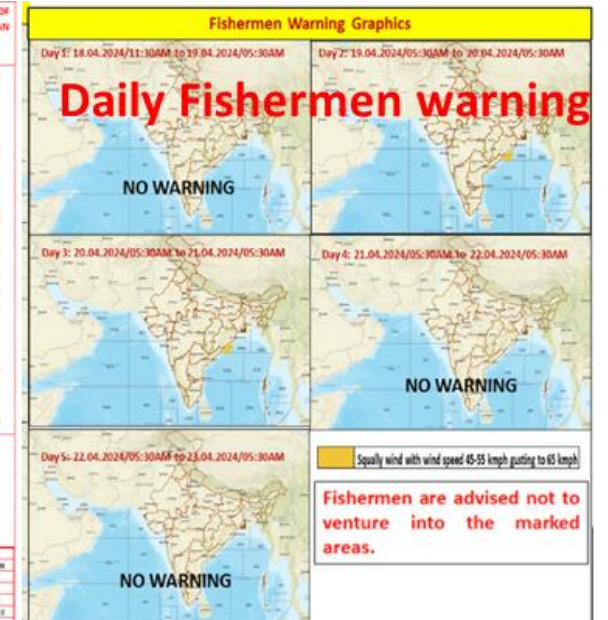


Cyclone Forecast Track



DATE/TIME IN UTC
15th JUNE 2023

LESS THAN 34 KT
34-47 KT
48-63 KT
64-75 KT
76-85 KT
86-100 KT
101-119 KT
120-137 KT
138-155 KT
156-173 KT
174-191 KT
192-209 KT
210-227 KT
228-245 KT
246-263 KT
264-281 KT
282-299 KT
300-317 KT
318-335 KT
336-353 KT
354-371 KT
372-389 KT
390-407 KT
408-425 KT
426-443 KT
444-461 KT
462-479 KT
480-497 KT
498-515 KT
516-533 KT
534-551 KT
552-569 KT
570-587 KT
588-605 KT
606-623 KT
624-641 KT
642-659 KT
660-677 KT
678-695 KT
696-713 KT
714-731 KT
732-749 KT
750-767 KT
768-785 KT
786-803 KT
804-821 KT
822-839 KT
840-857 KT
858-875 KT
876-893 KT
894-911 KT
912-929 KT
930-947 KT
948-965 KT
966-983 KT
984-1001 KT
1002-1019 KT
1020-1037 KT
1038-1055 KT
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1920-1937 KT
1938-1955 KT
1956-1973 KT
1974-1991 KT
1992-2009 KT
2010-2027 KT
2028-2045 KT
2046-2063 KT
2064-2081 KT
2082-2099 KT
2100-2117 KT
2118-2135 KT
2136-2153 KT
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2172-2189 KT
2190-2207 KT
2208-2225 KT
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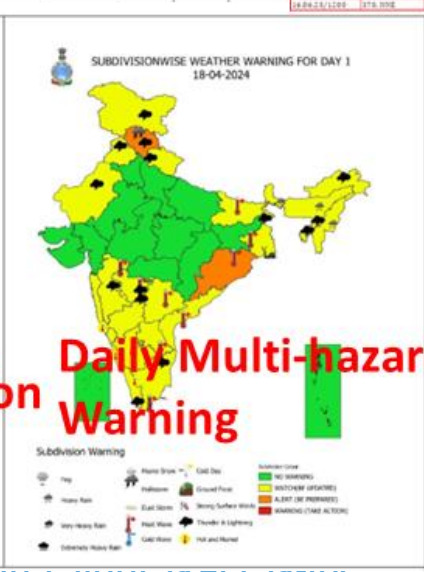


Mean Maximum Sustained Surface Wind

Less than 17 knots/Less than 31 kmph	34-47 knots/62-87 kmph
17-21 knots/31-39 kmph	48-63 knots/88-117 kmph
22-27 knots/40-49 kmph	64-89 knots/118-167 kmph
28-33 knots/50-61 kmph	90-119 knots/168-221 kmph
	120 knots and more/222 kmph

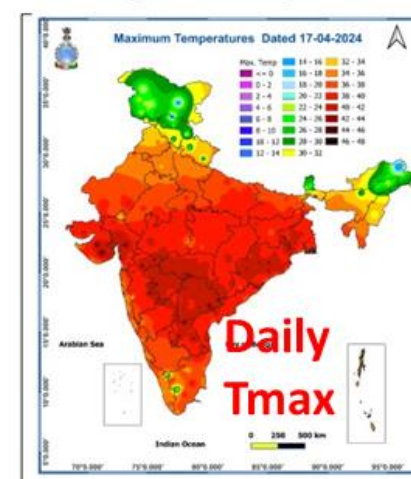


Rainfall distribution Forecast



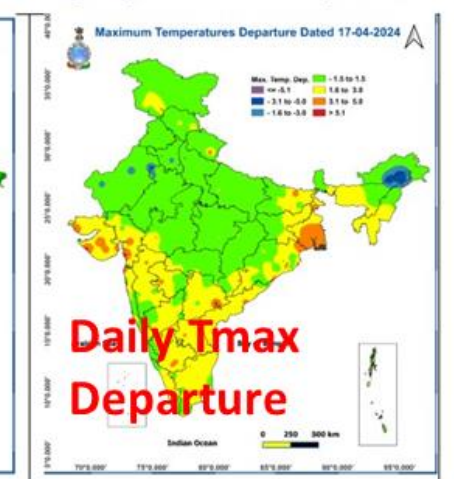
Daily Multi-hazard Warning

Fig. 1: Maximum Temperatures



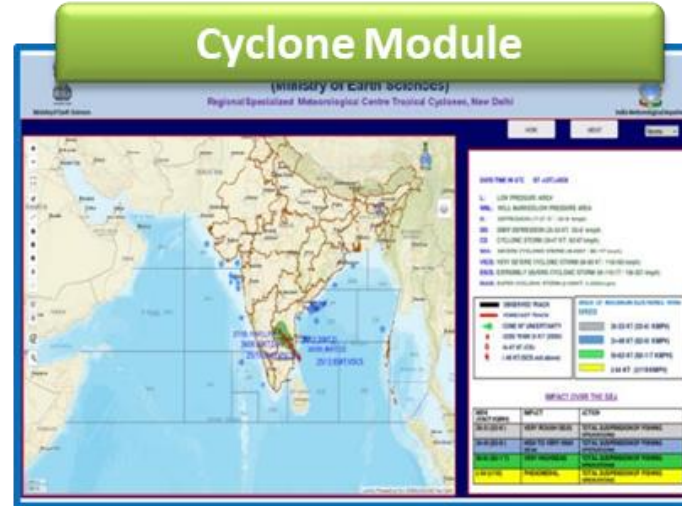
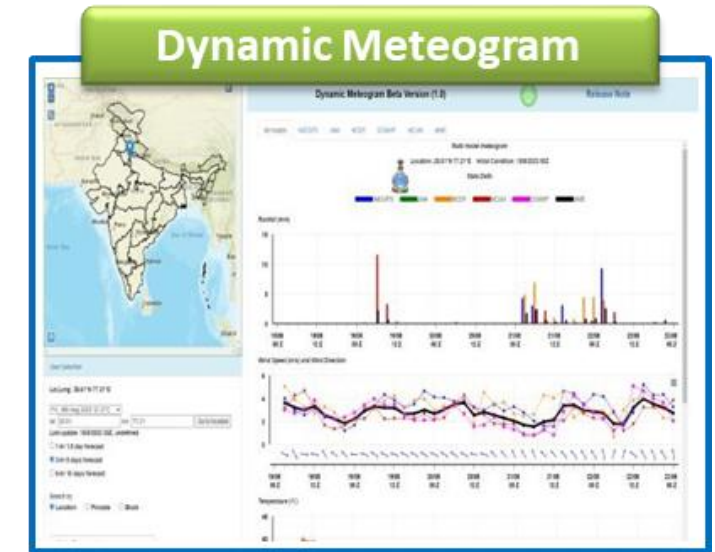
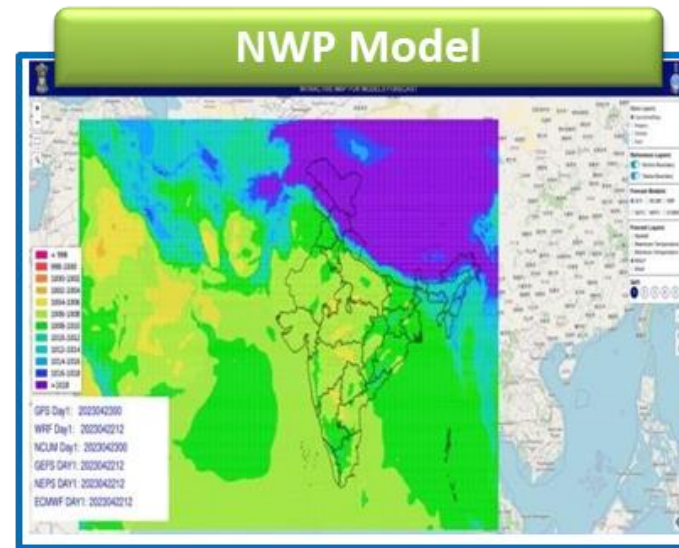
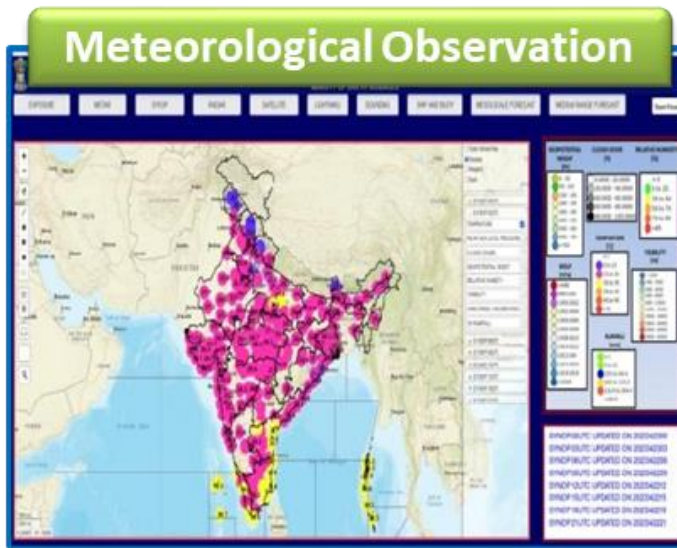
Daily Tmax

Fig. 2: Departure of Maximum Temperatures

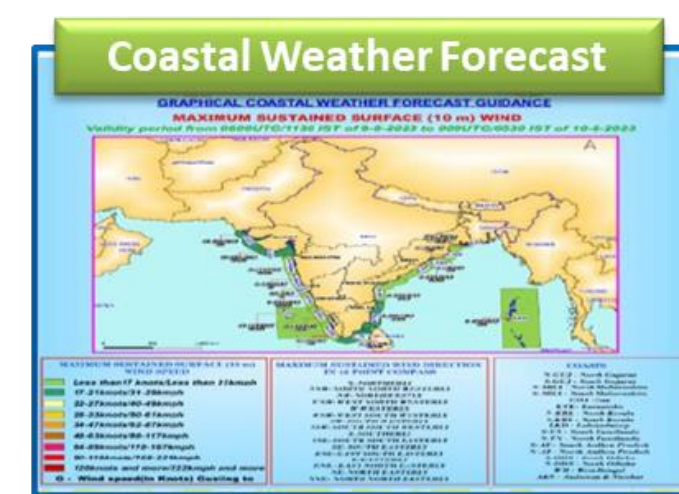
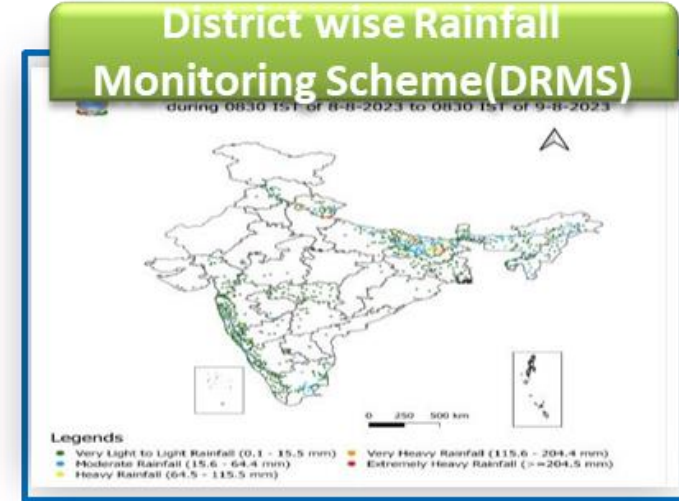
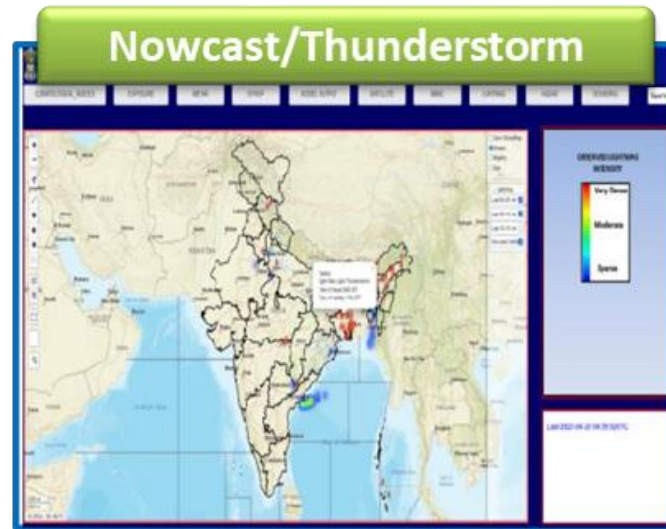
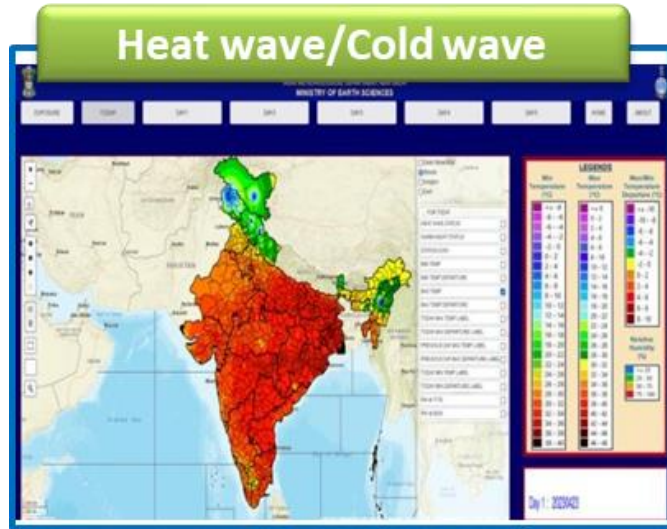


Daily Tmax Departure

DSS Products: Sectorial Applications

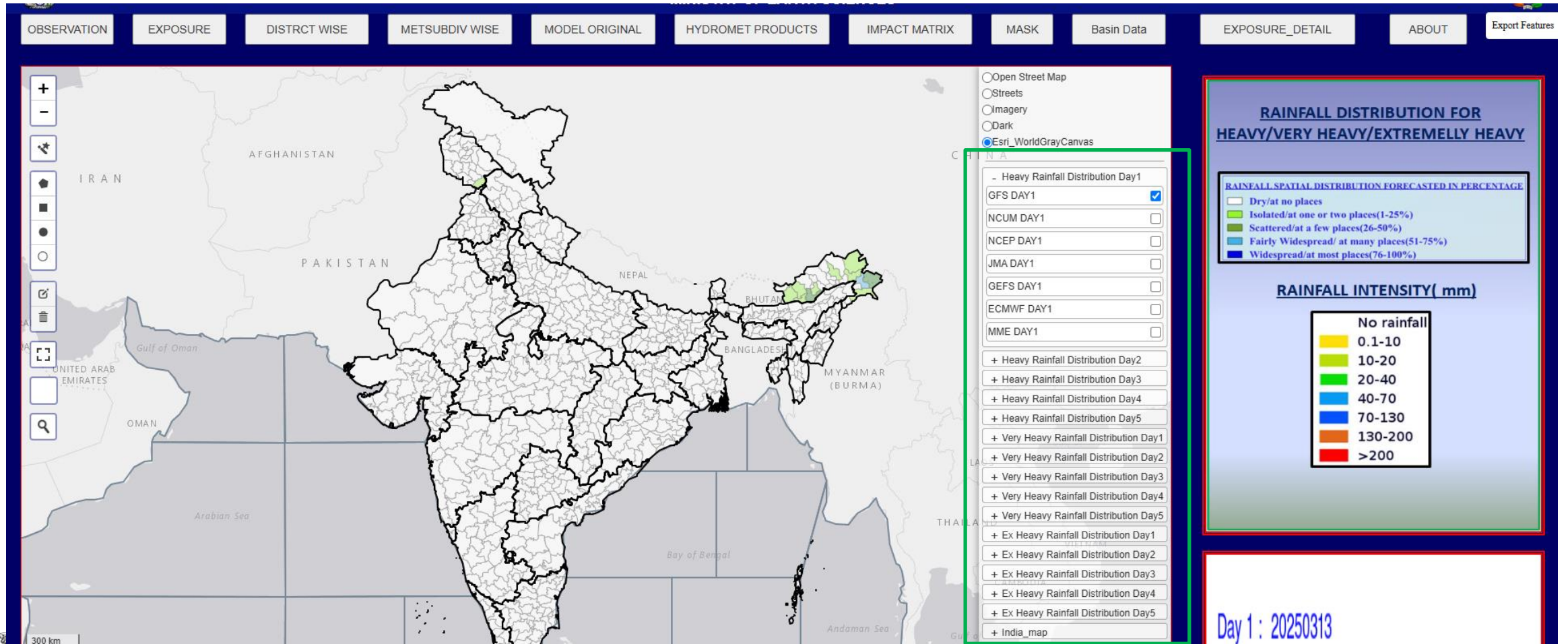


DSS Products: Sectorial Applications



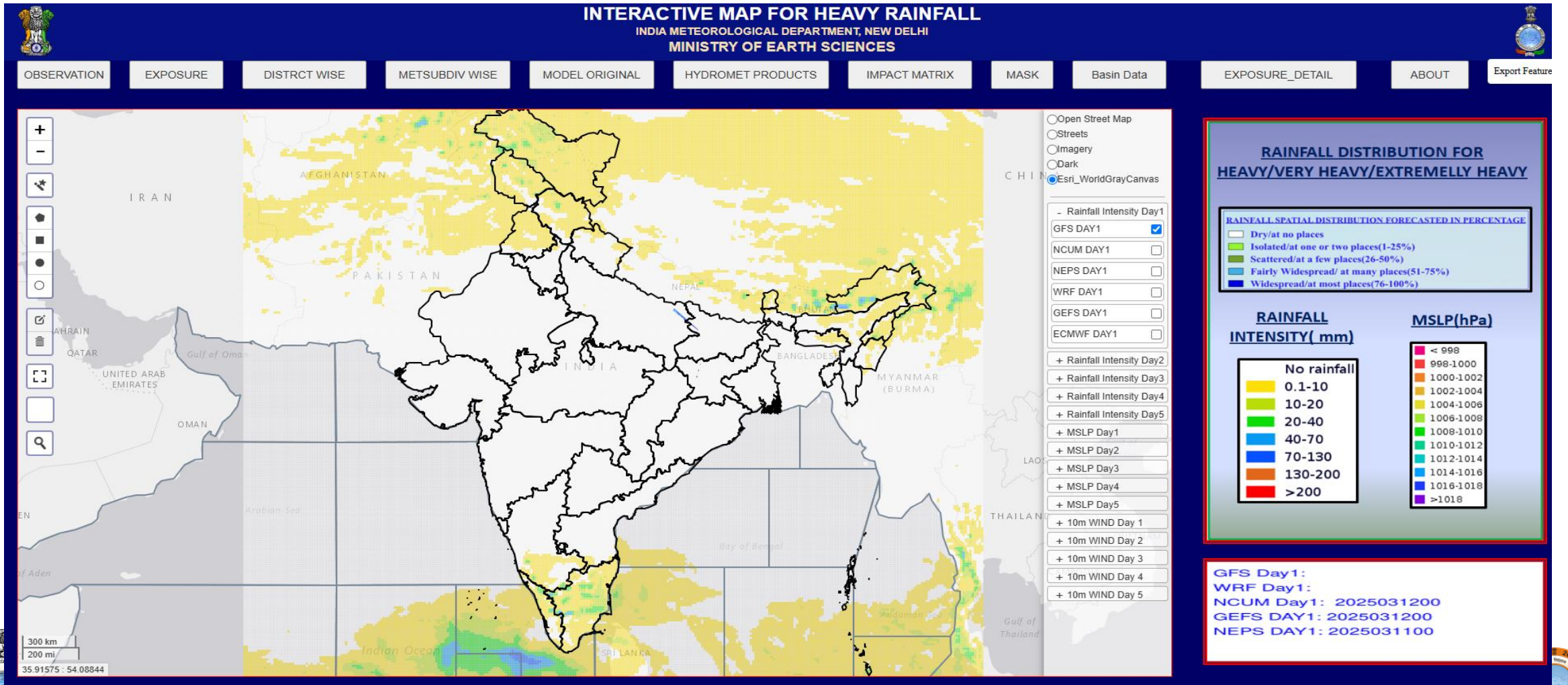
Specialized Module: Heavy Rainfall

District wise model based rainfall distribution



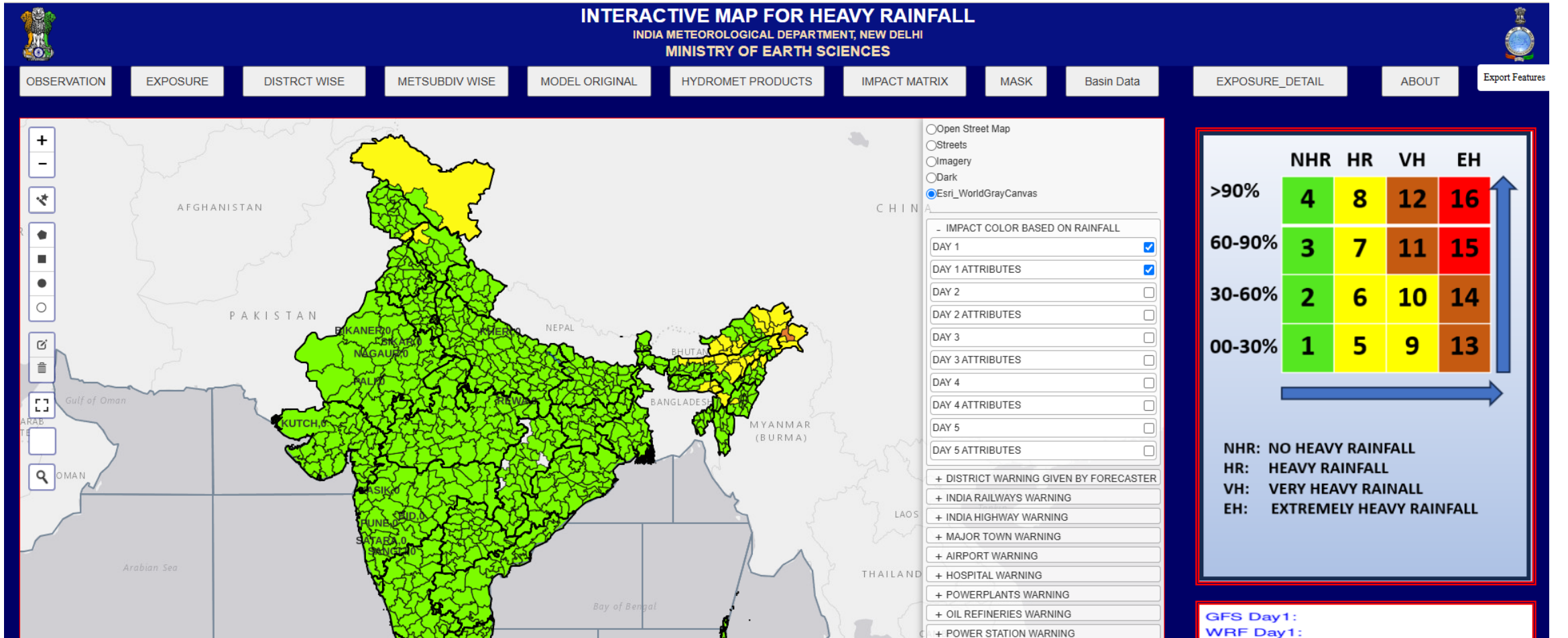
Specialized Module: Heavy Rainfall

Model based rainfall intensity



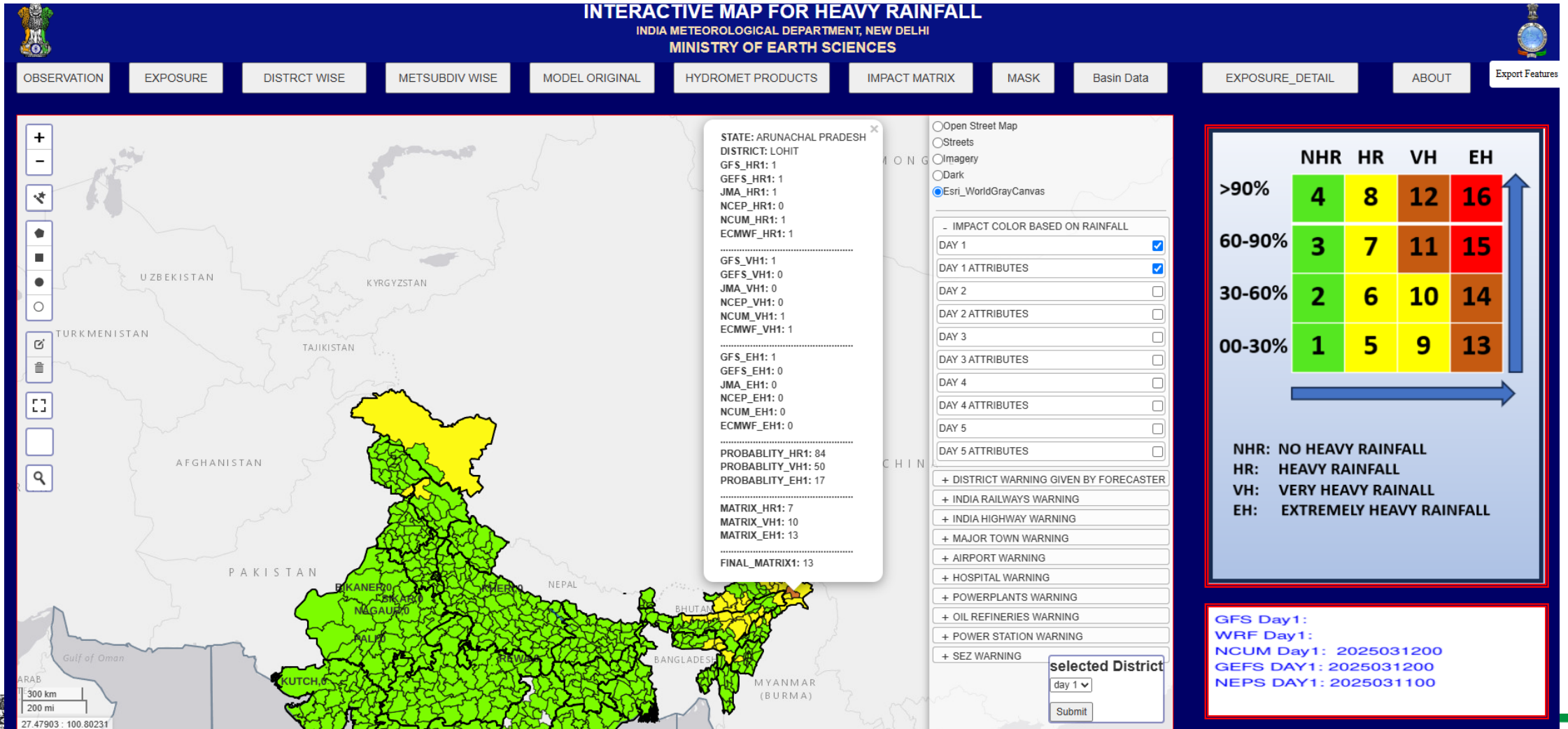
Specialized Module: Heavy Rainfall

Impact matrix based on model guidance

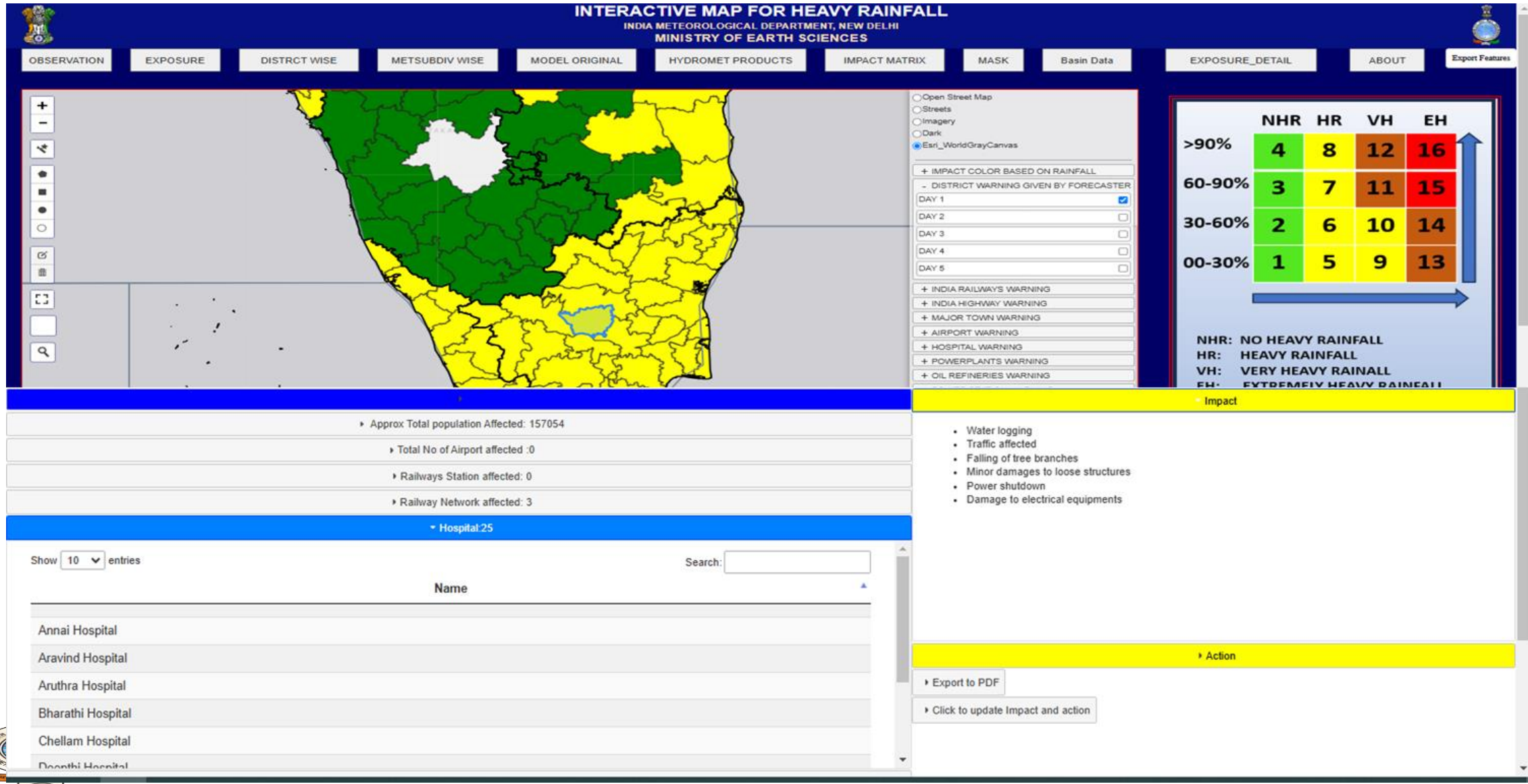


Specialized Module: Heavy Rainfall

Impact matrix based on model guidance



DSS: Impact based forecasting



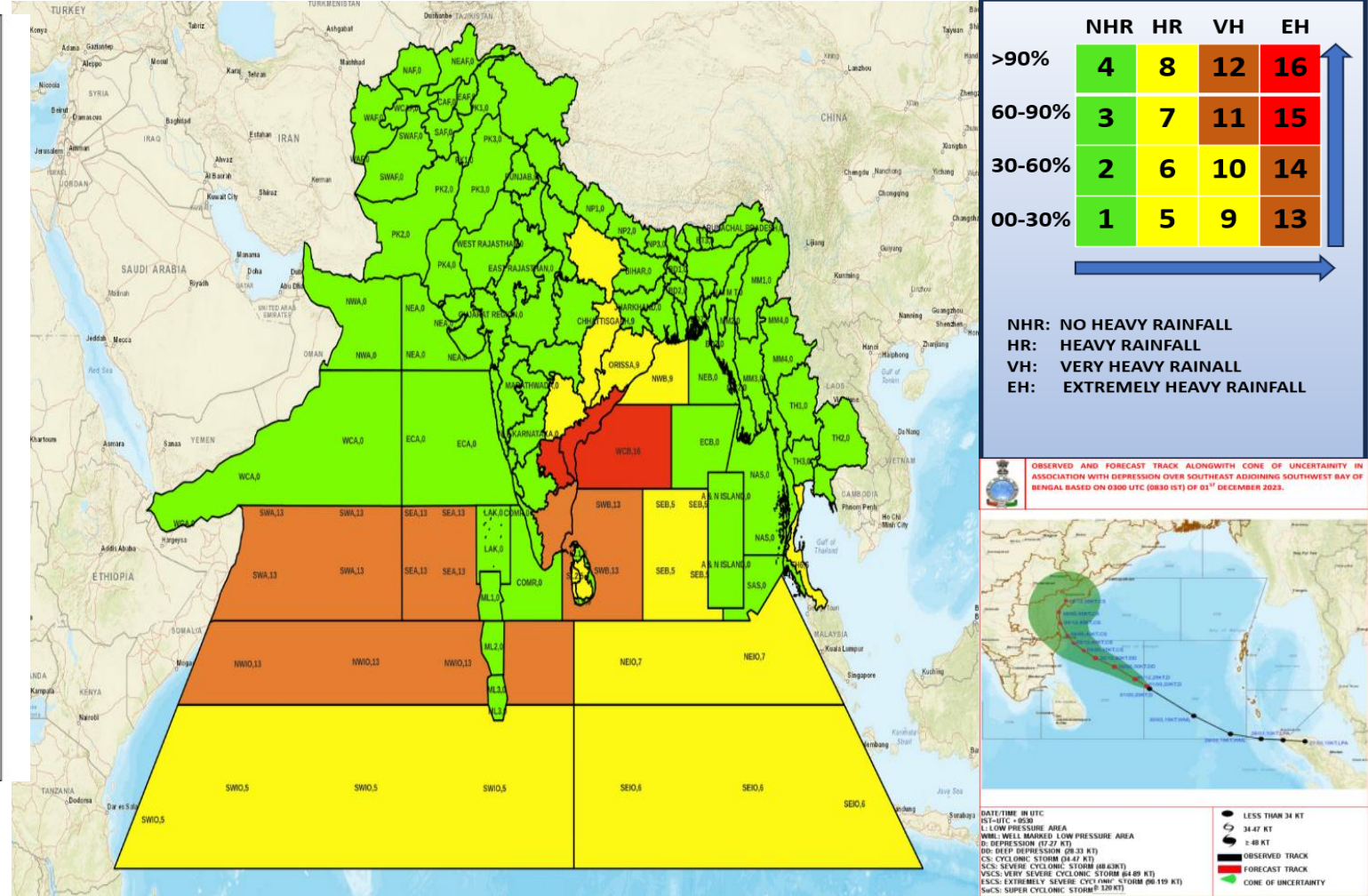
Severe Weather Forecasting Programme (SWFP)-South Asia module

SEVERE WEATHER FORECASTING PROGRAMME(SWFP)-SOUTH ASIA REGIONAL SPECIALISED METEOROLOGICAL CENTRE, NEW DELHI SHORT RANGE GUIDANCE DAY-1: 17.04.2024/0600 UTC to 18.04.2024/0600 UTC

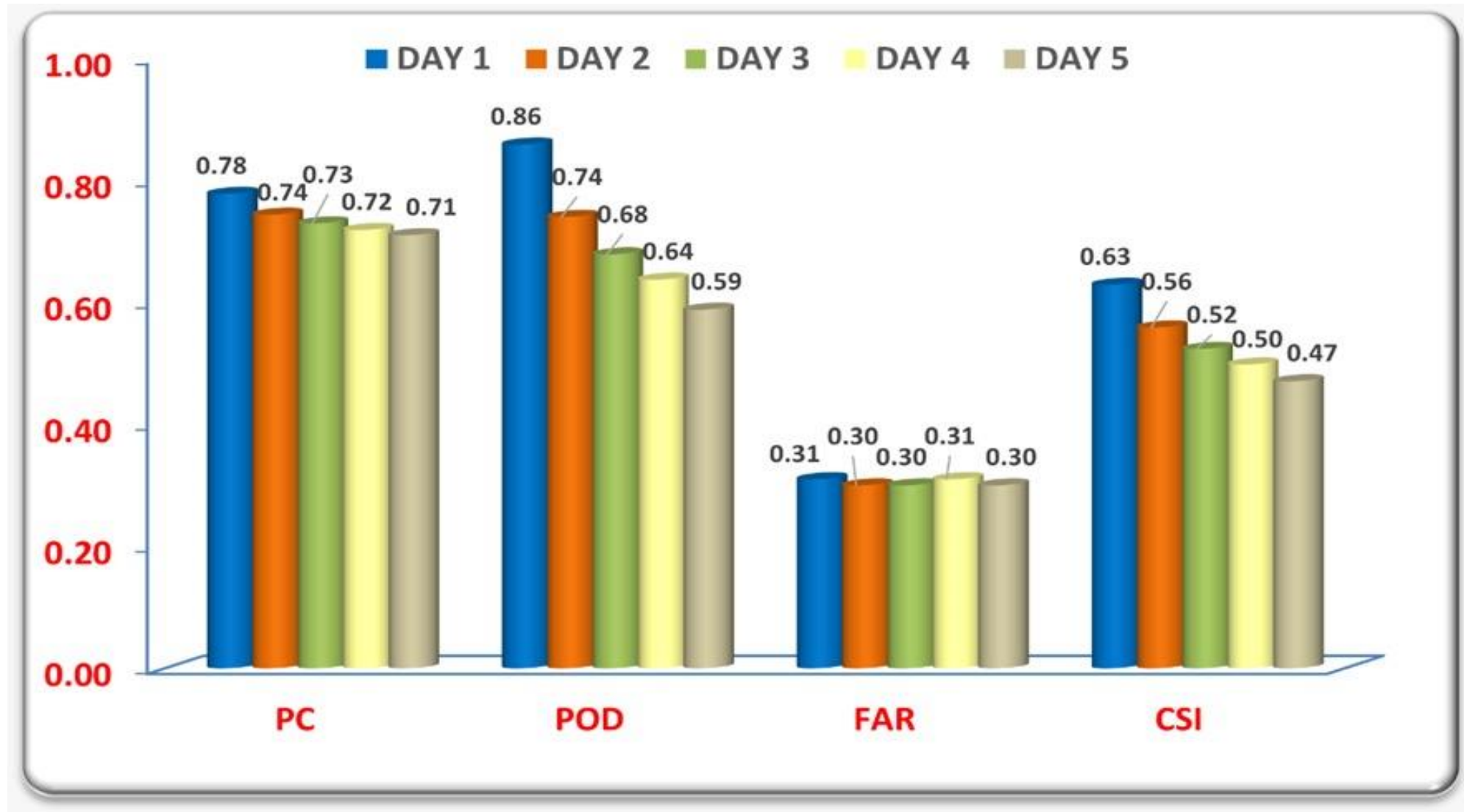


24 Hrs. Rainfall	
≥ 50mm	
≥ 100mm	
Squally weather	
Squally Winds	
17-27 KT(32-51 KMPH)	
28-33KT(52-61 KMPH)	
Gale wind	
34-49KT(62-91 KMPH)	
50-63KT(92-117 KMPH)	
≥ 64 KT(≥ 118 KMPH)	
High Waves ≥ 2.5 m	
Storm Surge ≥ 1 m	

NWA	Northwest Arabian Sea
NEA	Northeast Arabian Sea
ECA	Eastcentral Arabian Sea
SEA	Southeast Arabian Sea
WCA	Westcentral Arabian Sea
SWA	Southwest Arabian Sea
LAK	Lakshadweep
MAL	Maldives
COM	Comorin Area
NWB	Northwest Bay of Bengal
WCB	Westcentral Bay of Bengal
SWB	Southwest Bay of Bengal
NEB	Northeast Bay of Bengal
ECB	Eastcentral Bay of Bengal
SEB	Southeast Bay of Bengal
NAS	North Andaman Sea
SAS	South Andaman Sea



Skill Score: 2024



भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT



Benefits of DSS

- Real-Time Updates
- Enhanced Accuracy in Forecasting
- Disaster Management and Early Warning Systems
- User-Friendly and Collaborative Decision-Making



THANK YOU

