

UN/Austria symposium "Space for climate action: experiences and best practices in mitigating and adapting to climate change and supporting sustainability on Earth."



Space data applications for quick response during recent hydro meteorological disasters

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VIT – Recognised as Institution of Eminence (IoE) by Government of India

Recent Significant Hydro Met Disasters

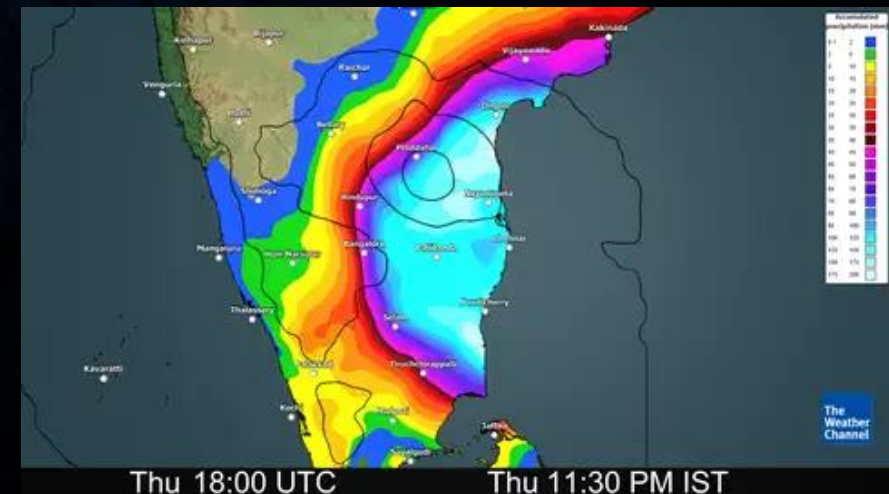
2015 Tamil Nadu Floods



2018 Kerala Floods

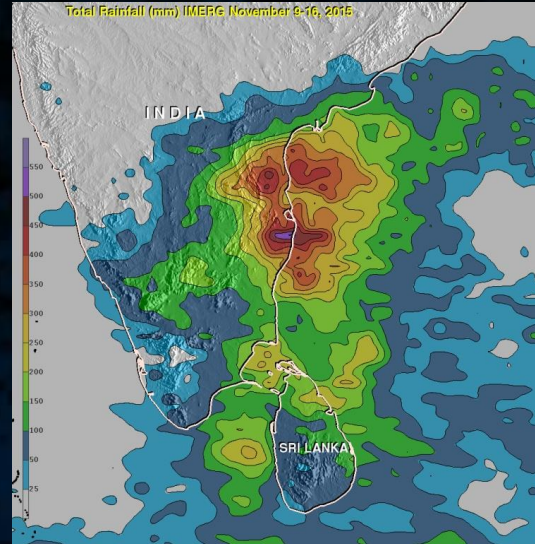


2020 Nivar Cyclone

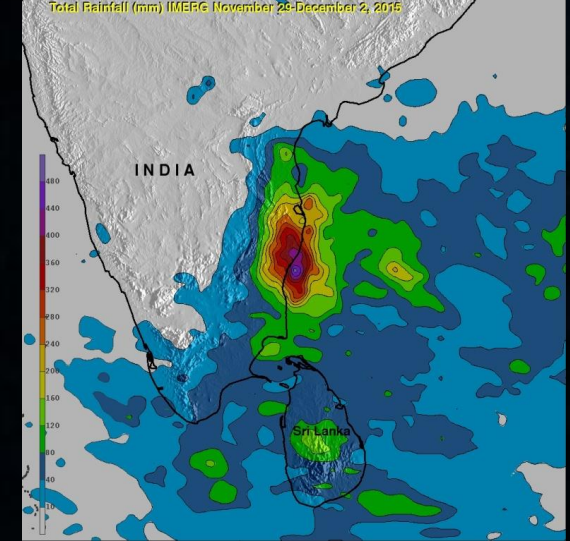


2015 South Indian floods

Source : NASA TRMM



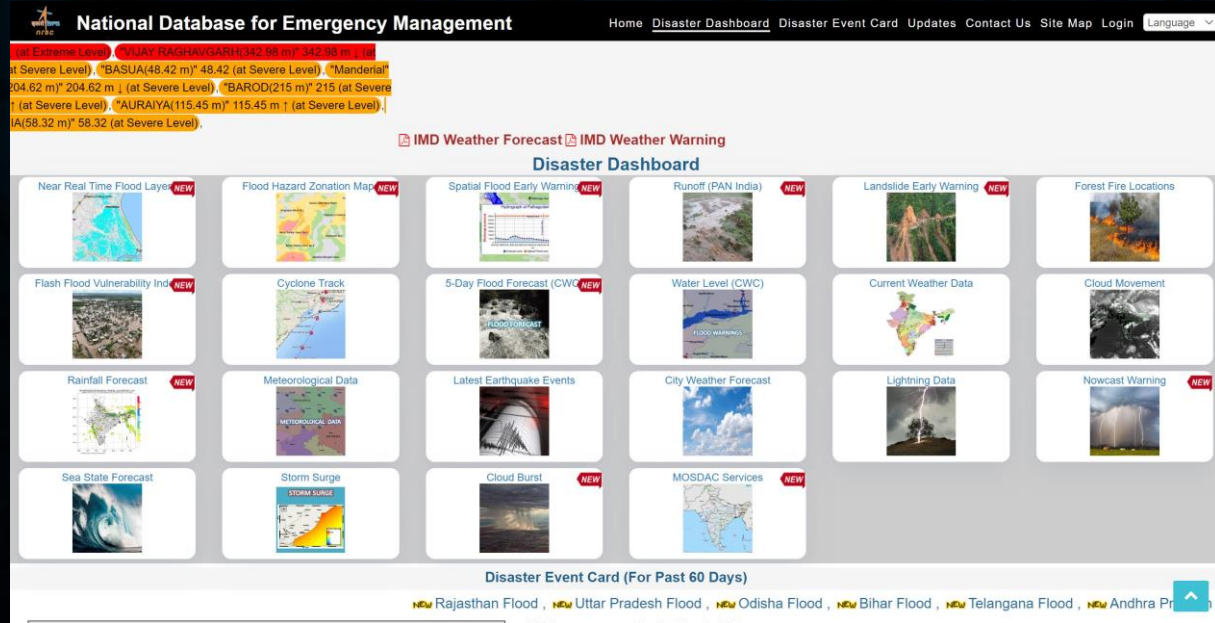
November 9 -16, 2015
Total Rainfall (mm)



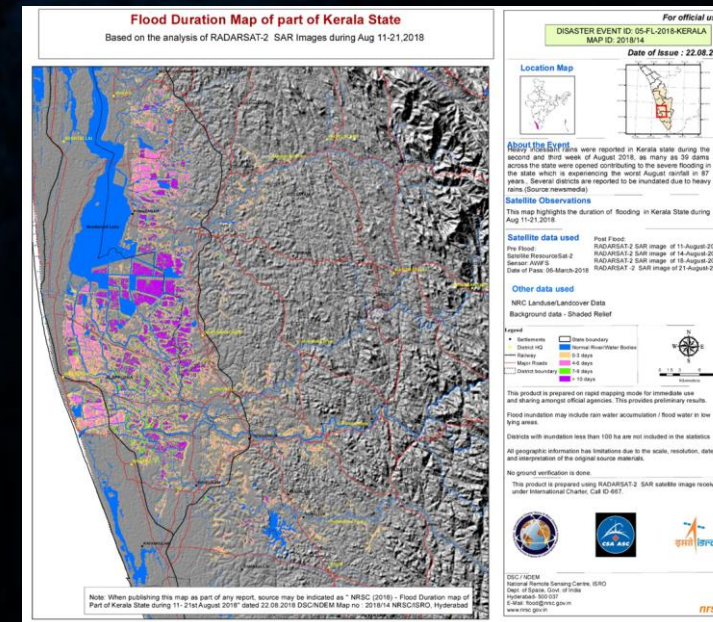
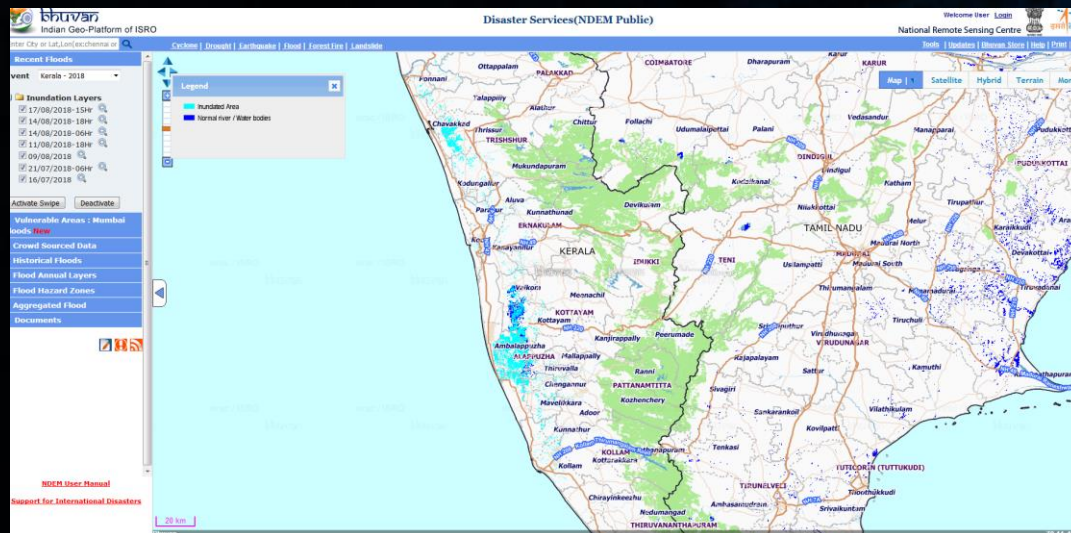
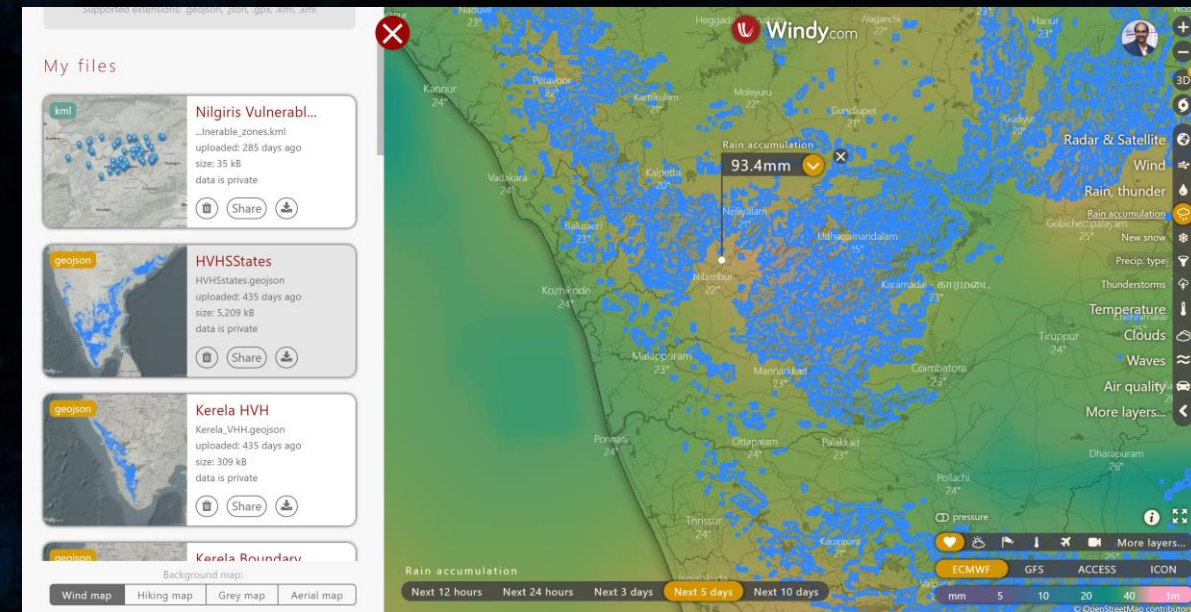
November 29 – December 2, 2015
Total Rainfall (mm)

- The 2015 South Indian floods resulted from heavy rainfall generated by the annual northeast monsoon in November–December 2015.
- More than 500 people were killed and over 1.8 million people were displaced.
- Losses ranging from nearly 200 billion (US\$3 billion) to over 1 trillion (US\$15 billion), the floods were the costliest to have occurred in 2015 in India

National Database for Emergency Management



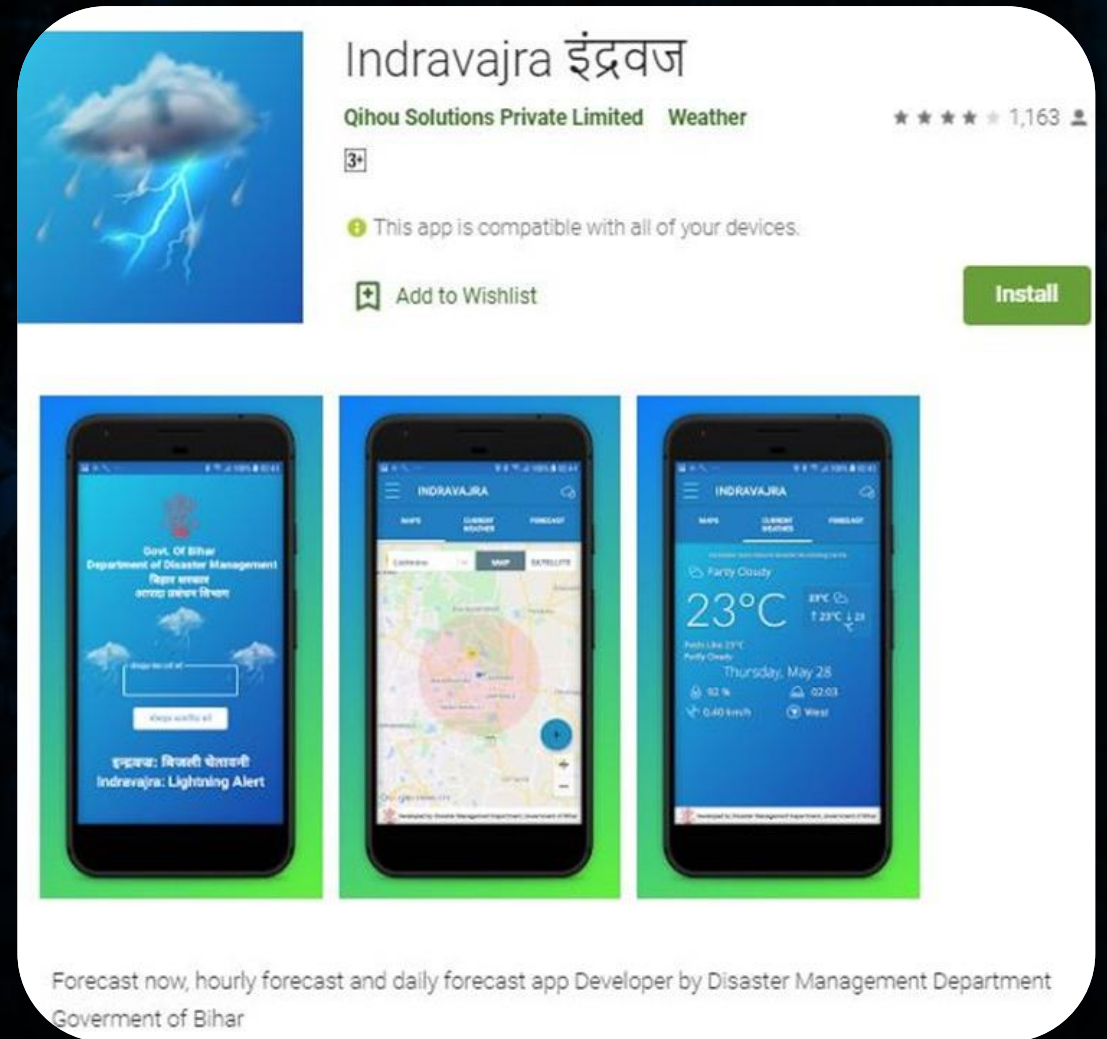
Windy with Hazard Layers



International Disaster Charter

ISRO Bhuvan Data Portal

Emergency management Apps





Ministry of Earth Sciences

India Meteorological Department (Ministry of Earth Sciences)

Regional Specialized Meteorological Centre-Tropical Cyclones, New Delhi



India Meteorological Department

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DATE/TIME IN UTC IST +UTC+0530

L: LOW PRESSURE AREA
WML: WELL MARKED LOW PRESSURE AREA
D: DEPRESSION (17-27 KT / 32-51 kmph)
DD: DEEP DEPRESSION (28-33 KT / 52-61 kmph)
CS: CYCLONIC STORM (34-47 KT / 62-87 kmph)
VCS: SEVERE CYCLONIC STORM (48-63KT / 88-117 kmph)
VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT / 118-165 kmph)
ESCS: EXTREMELY SEVERE CYCLONIC STORM (100-119 KT / 186-221 kmph)
SUPER: SUPER CYCLONIC STORM (≥ 120KT / ≥ 222 kmph)



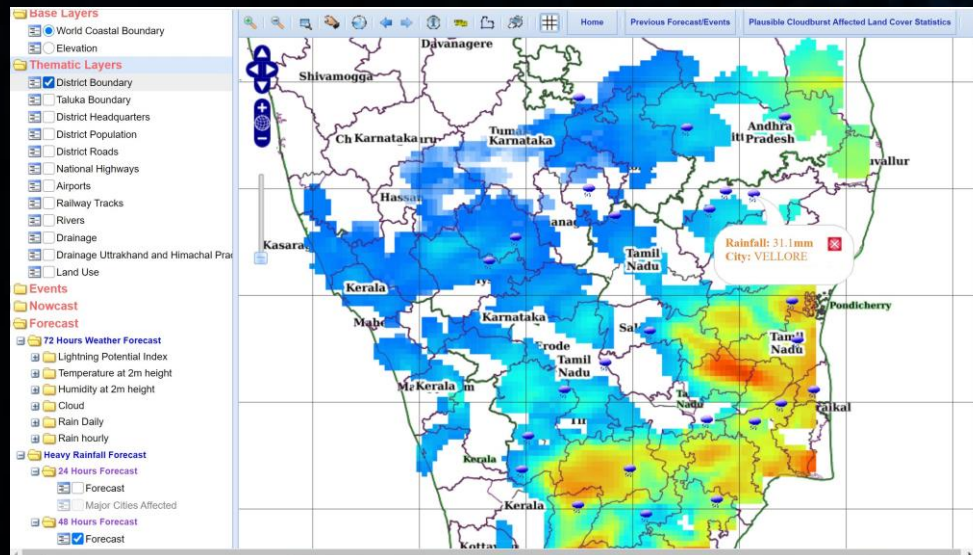
AREA OF MAXIMUM SUSTAINED WIND SPEED

28-33 KT (52-61 KMPH)
34-49 KT (62-91 KMPH)
50-63 KT (92-117 KMPH)
≥ 64 KT (≥118 KMPH)

IMPACT OVER THE SEA

MSW (KNOT/KMPH)	IMPACT	ACTION
28-33 (52-61)	VERY ROUGH SEAS	TOTAL SUSPENSION OF FISHING OPERATIONS
34-49 (62-91)	HIGH TO VERY HIGH SEAS	TOTAL SUSPENSION OF FISHING OPERATIONS
50-63 (92-117)	VERY HIGH SEAS	TOTAL SUSPENSION OF FISHING OPERATIONS
≥ 64 (≥118)	PHENOMENAL	TOTAL SUSPENSION OF FISHING OPERATIONS

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CHRS data Portal

The current operational PERSIANN (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks) system developed by the Center for Hydrometeorology and Remote Sensing (CHRS) at the University of California, Irvine (UCI) uses neural network function classification/approximation procedures to compute an estimate of rainfall rate at each $0.25^\circ \times 0.25^\circ$ pixel of the infrared brightness temperature image provided by geostationary satellites. An adaptive training feature facilitates updating of the network parameters whenever independent estimates of rainfall are available. The PERSIANN system was based on geostationary infrared imagery and later extended to include the use of both infrared and daytime visible imagery. The PERSIANN algorithm used here is based on the geostationary infrared imagery to generate global rainfall. Rainfall product covers 60°S to 60°N globally. [Further reading.](#)

Data Period: March 2000 - Present

Coverage: 60°S to 60°N

Resolution: $0.25^\circ \times 0.25^\circ$

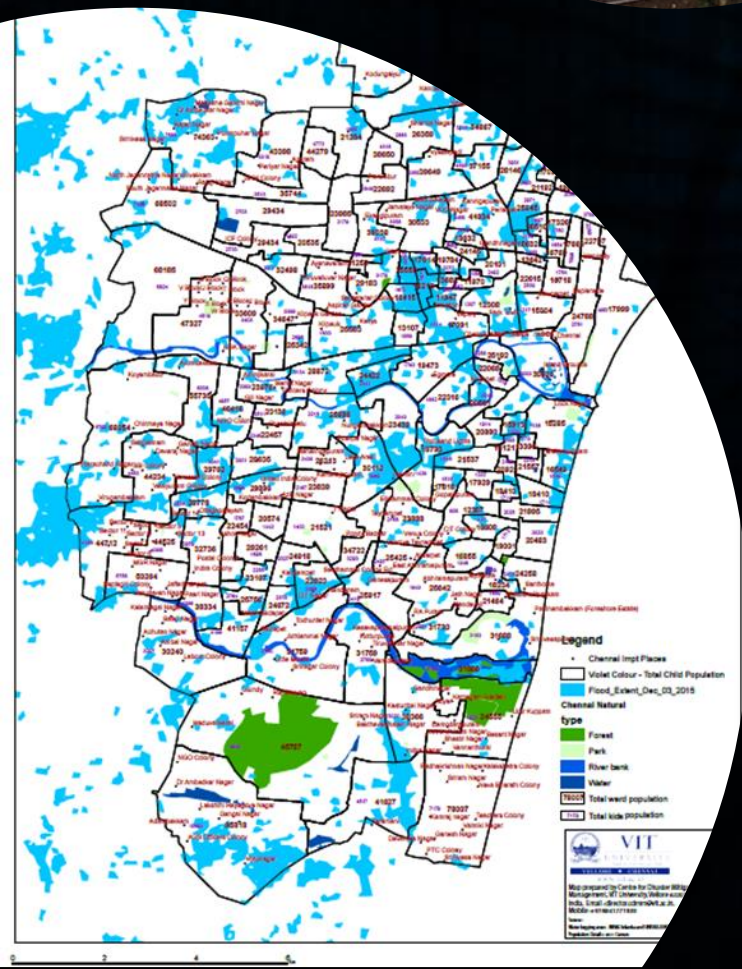
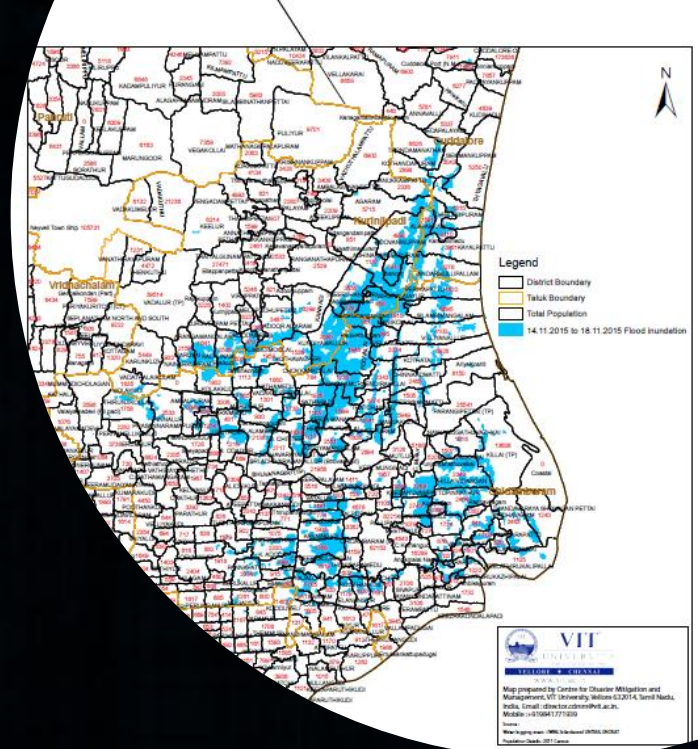
HTTP Download (full globe): [hourly](#), [3-hourly](#), [6-hourly](#), [daily](#), [monthly](#), [yearly](#)

FTP also available: <ftp://persiann.eng.uci.edu/CHRSdata/PERSIANN>

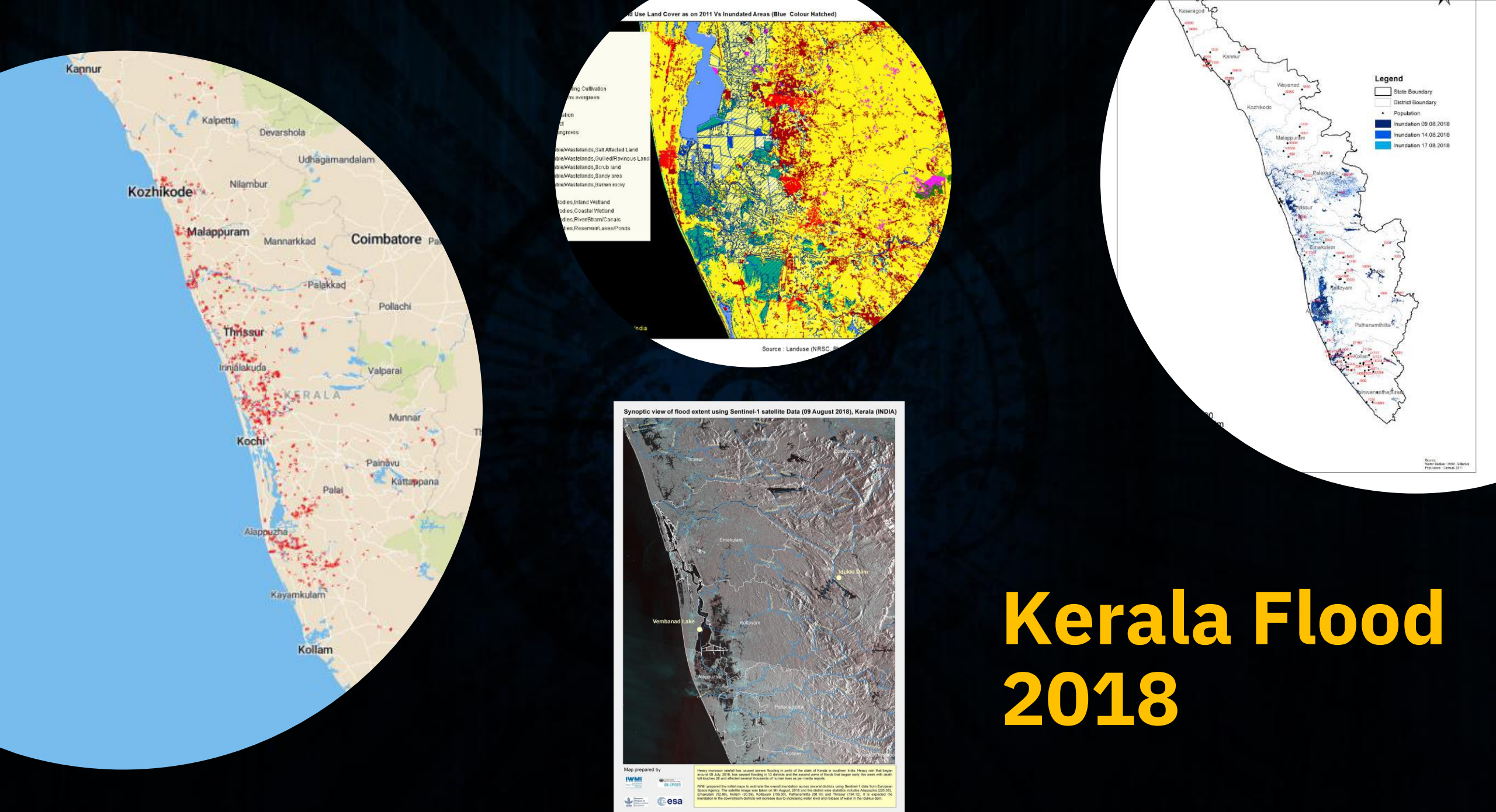
Latest Update: Near real-time with 2 day delay

Precipitation Stats

Max	410.12 mm
Min	51.63 mm
Mean	217.59 mm
Median	222.37 mm

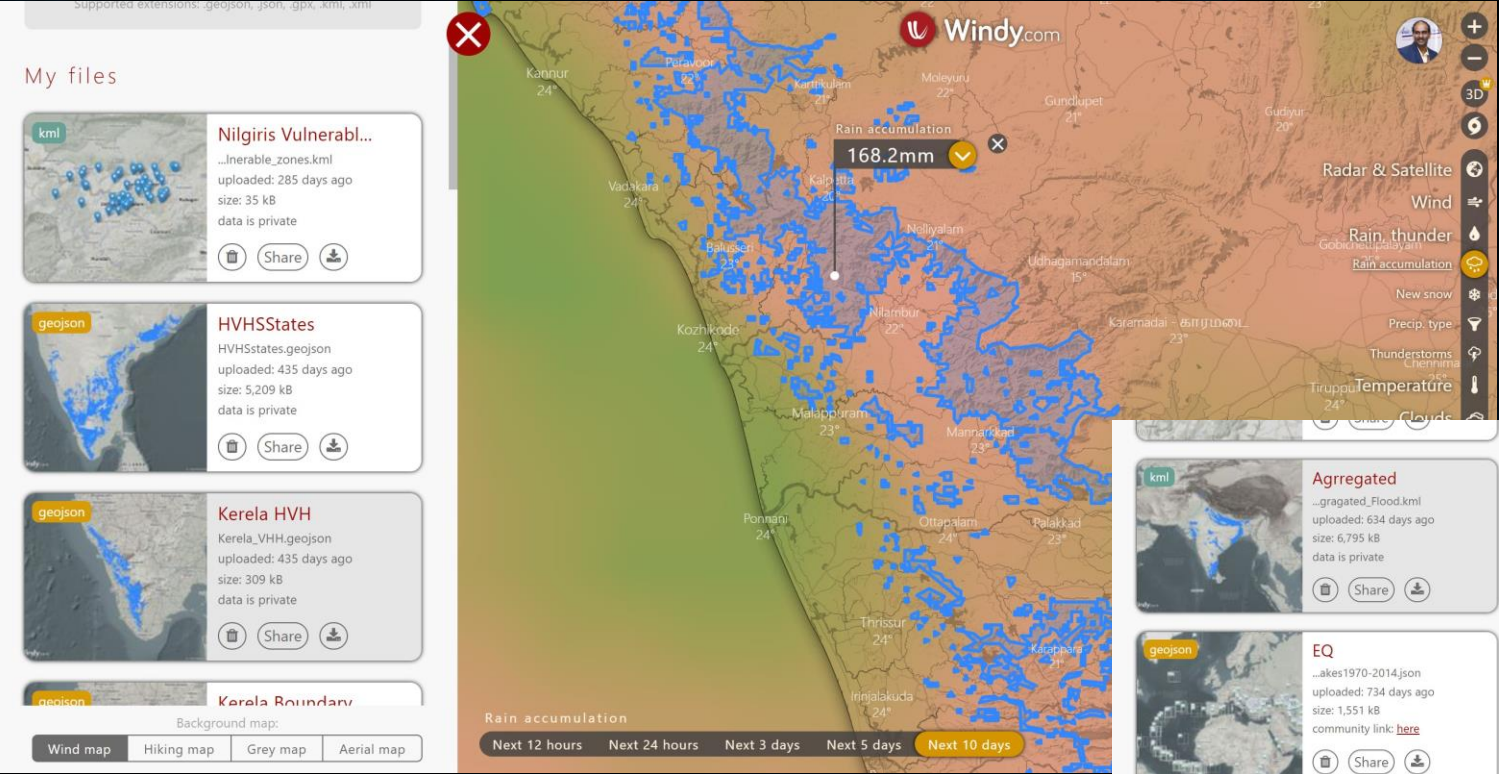


Chennai Floods- 2015

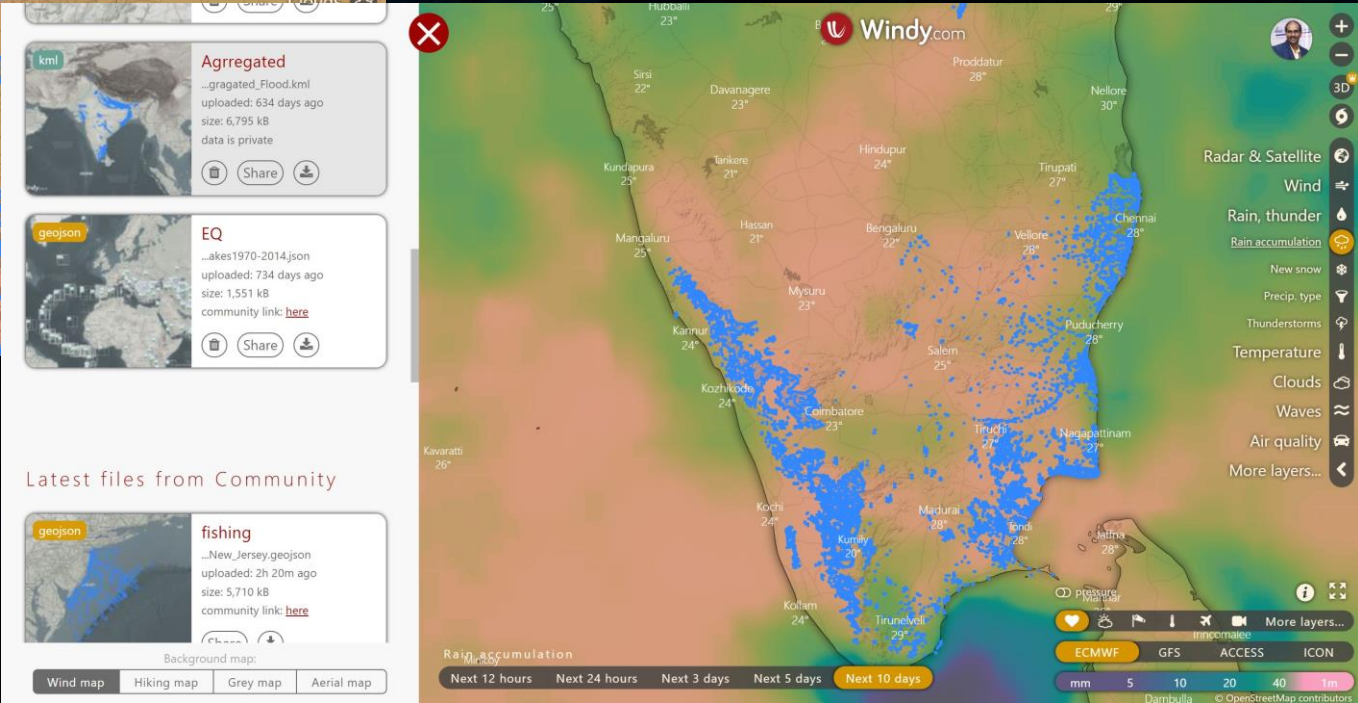


Data Sources : Twitter | Period : 16th and 17th August

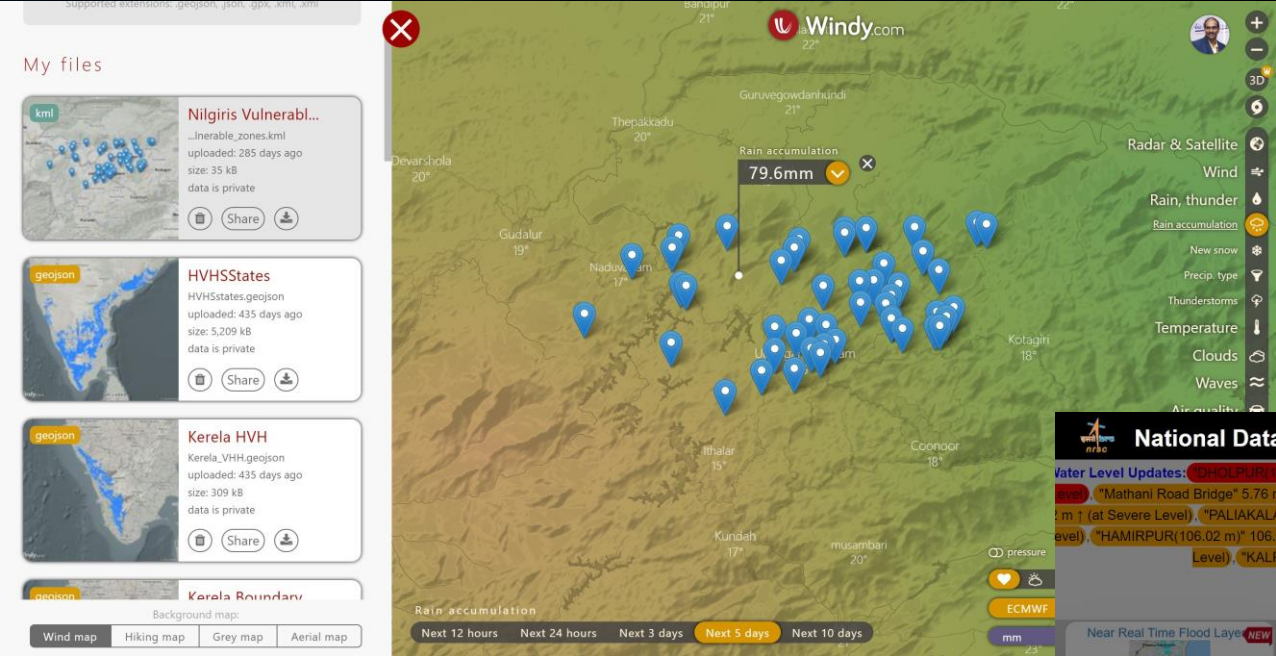
High and Very High Landslide Prone Areas in 10days expected Rain fall Accumulation



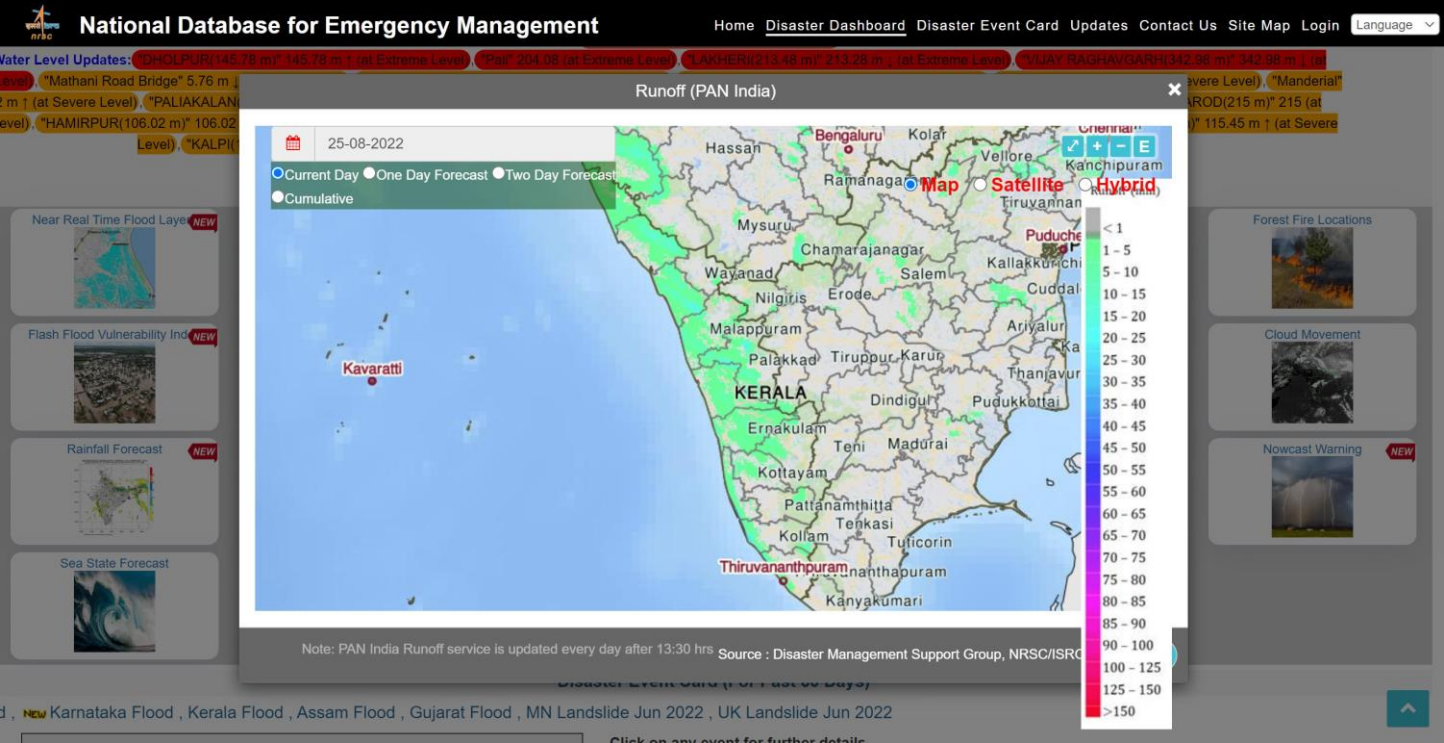
100 Years Aggregated Flood Prone Areas in 10days expected Rain fall Accumulation

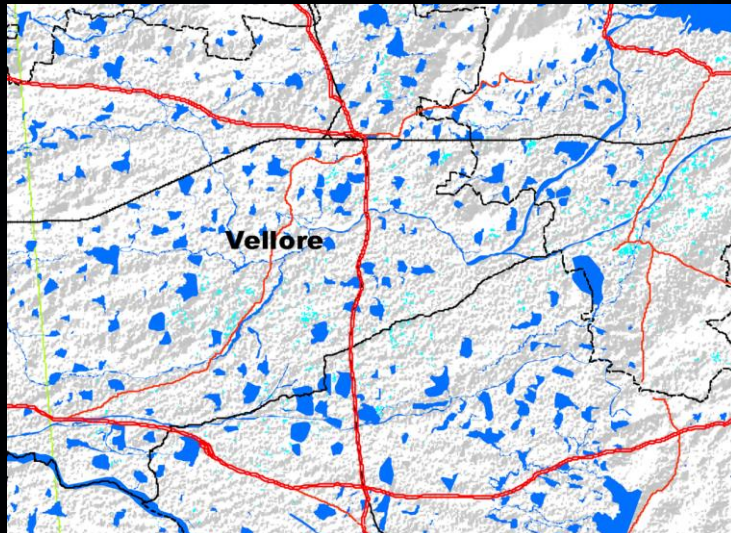
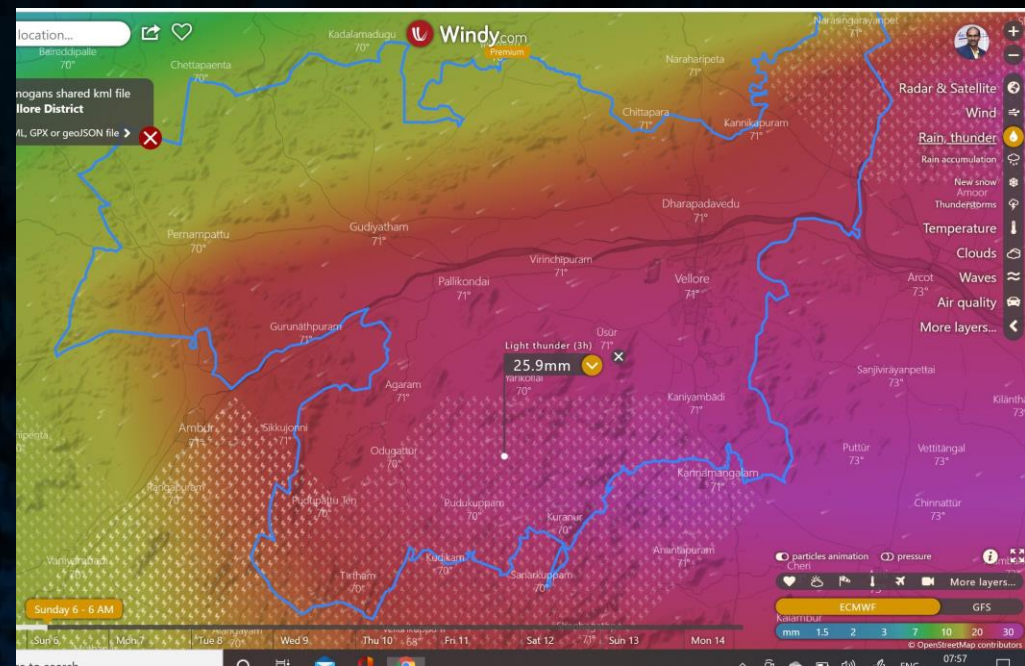


Landslide Vulnerable locations and 5 days expected Rainfall Accumulation

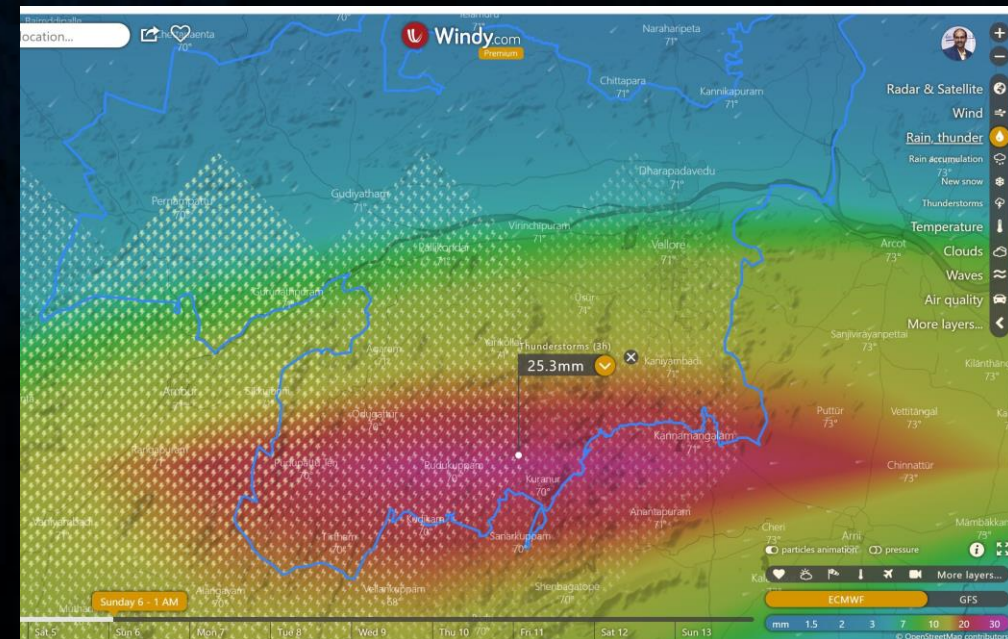


Runoff from NDEM Database

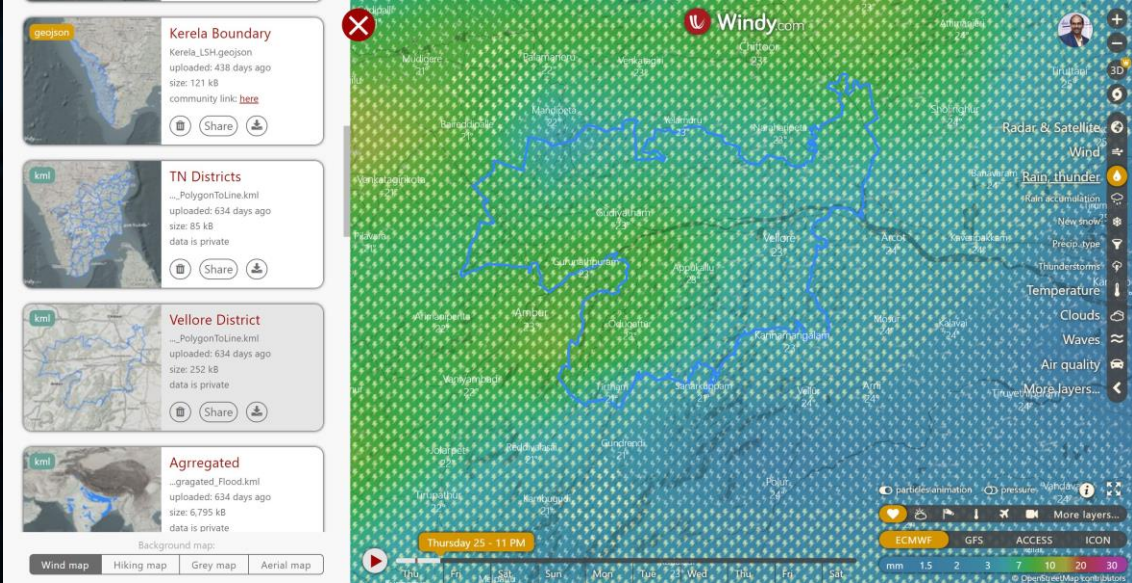




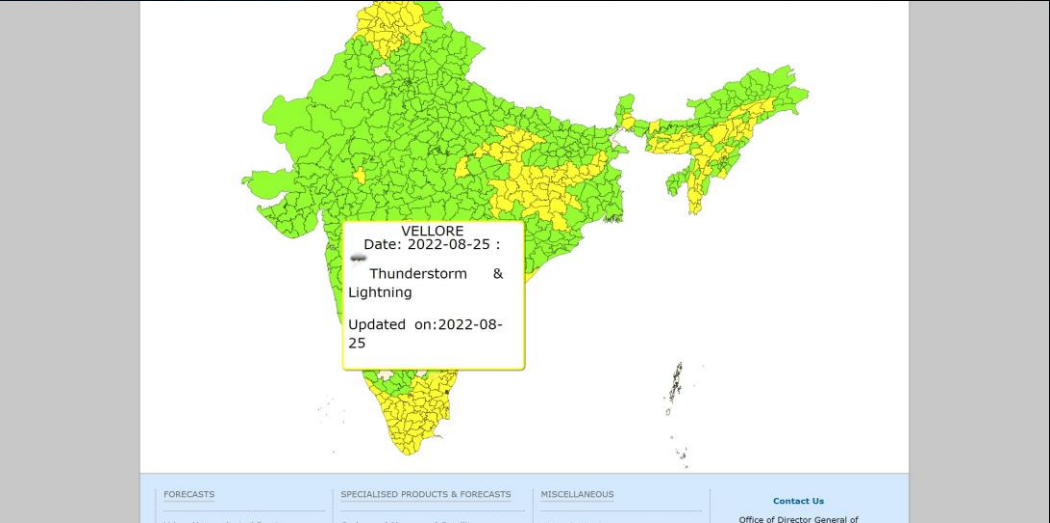
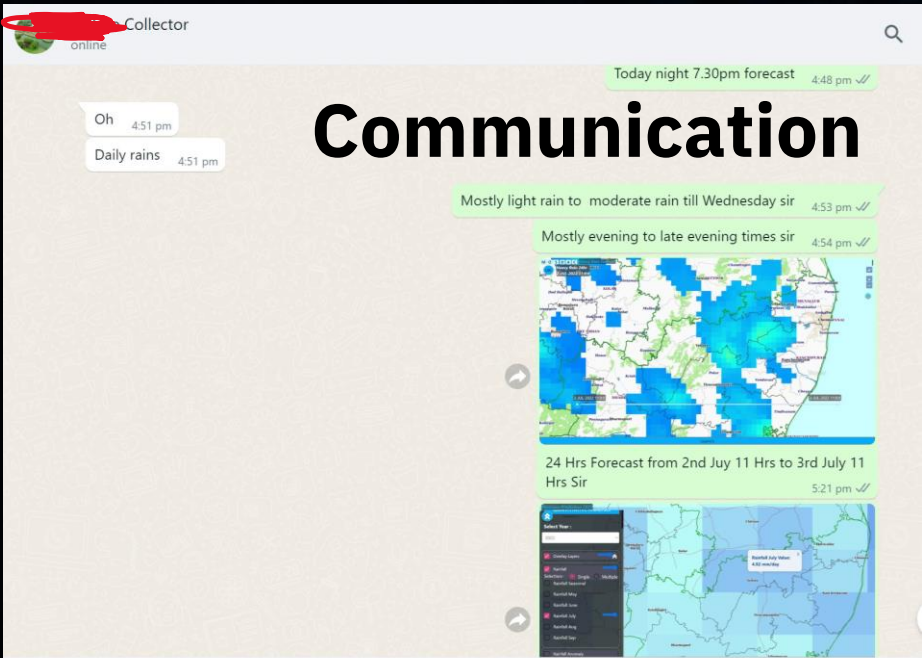
Hourly Rainfall Forecasting for District Level Windy, IMD and Disaster Charter



At Dam site - 10days expected Rain fall Accumulation

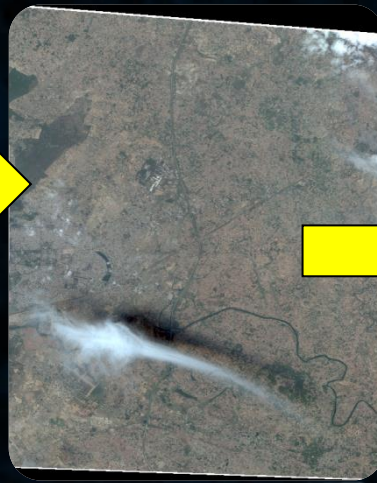


Hourly Rainfall Forecasting for District Level Windy and IMD

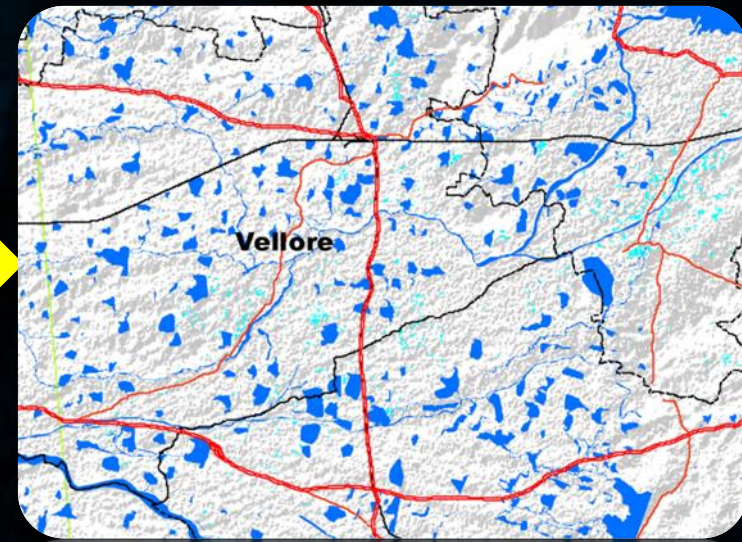




Satellite



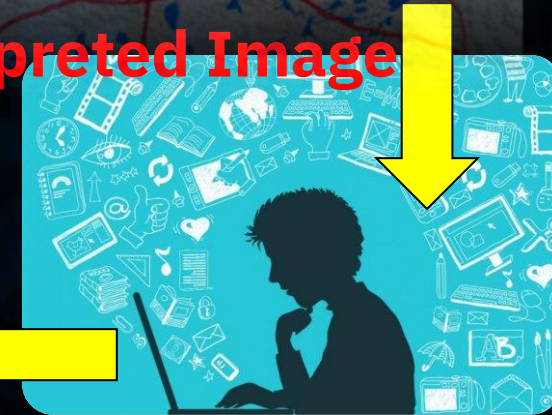
Raw Data



Interpreted Image



Social Media



Internet

- The satellite data is used effectively to quickly respond during disaster
- It is observed that the Social Media and other digital platforms are helps to quickly reach the ground level workers during disasters

Destination - Disaster Risk Free World

*Thank
You*

