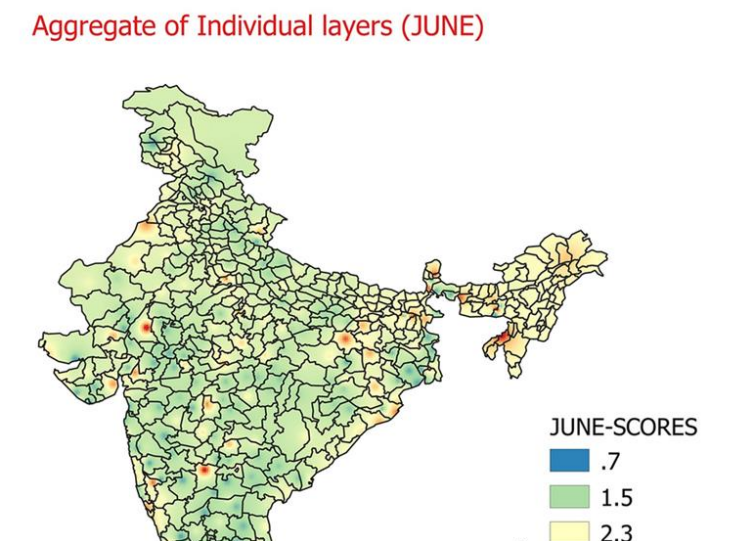
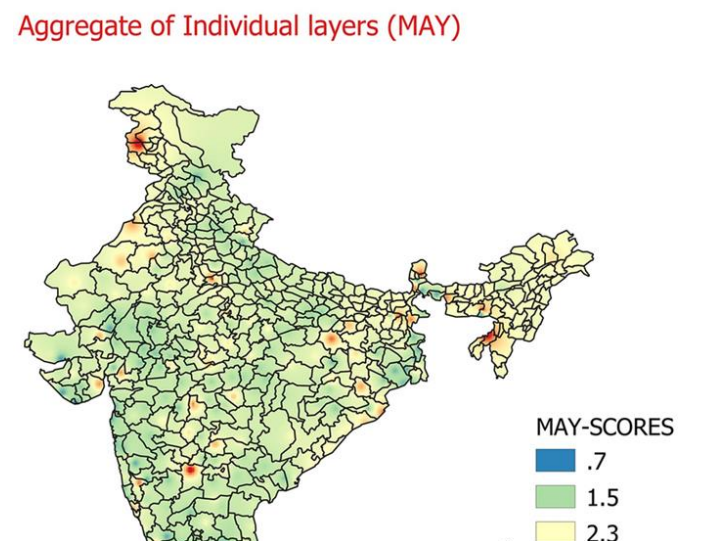
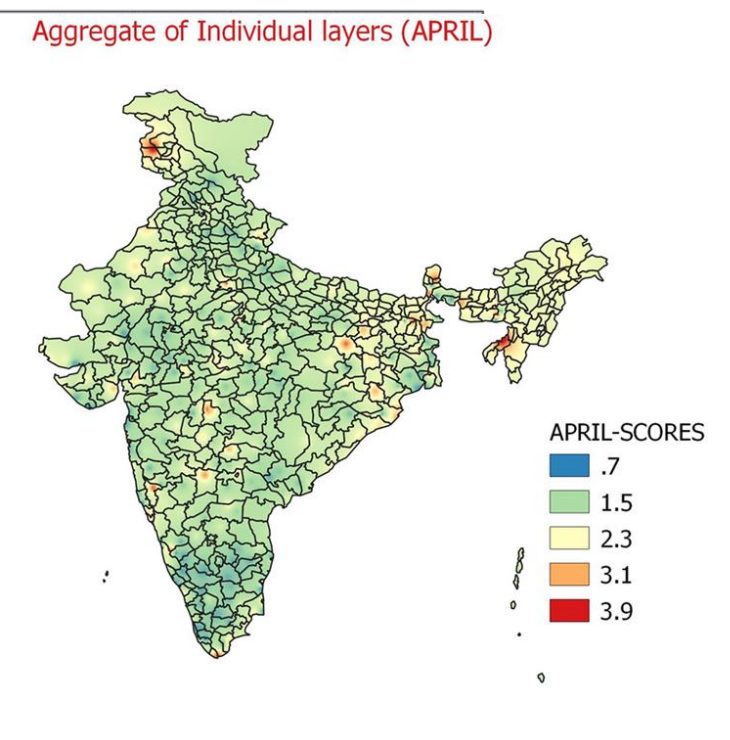
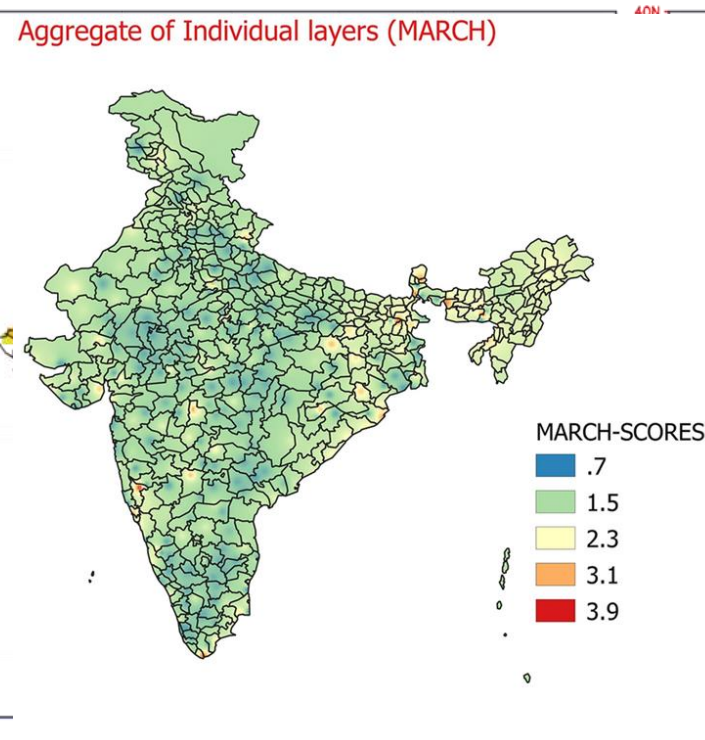
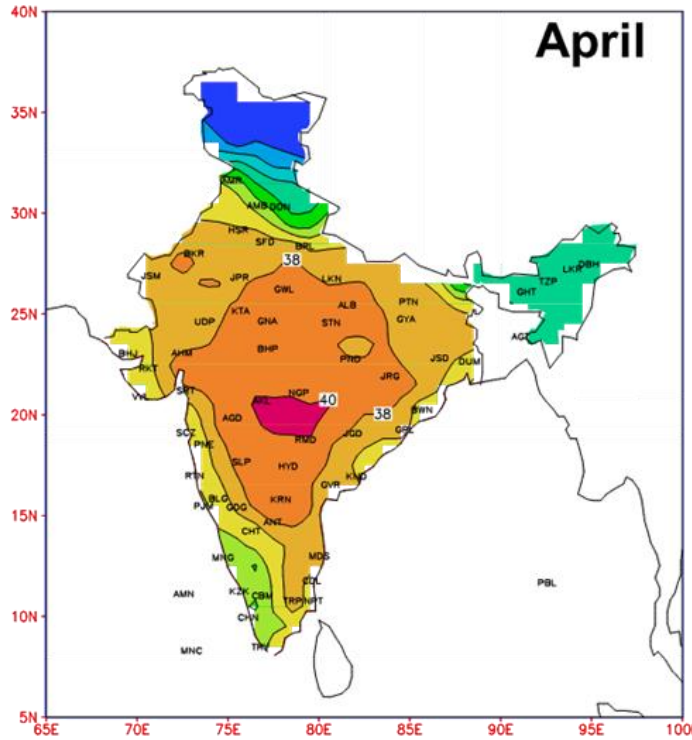


# Urban Meteorological Services for Indian Cities



# Main Period of Heat Waves: April - June

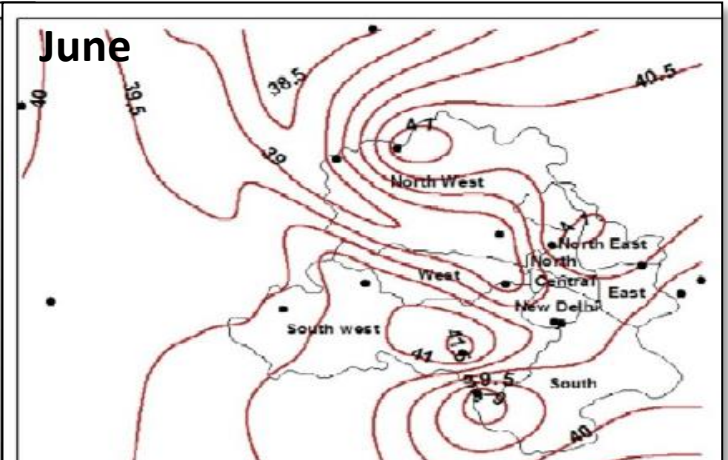
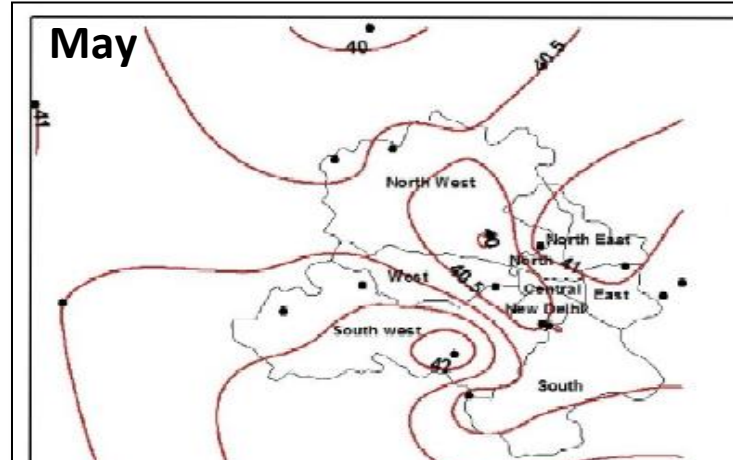


Daily average heat hazard scores

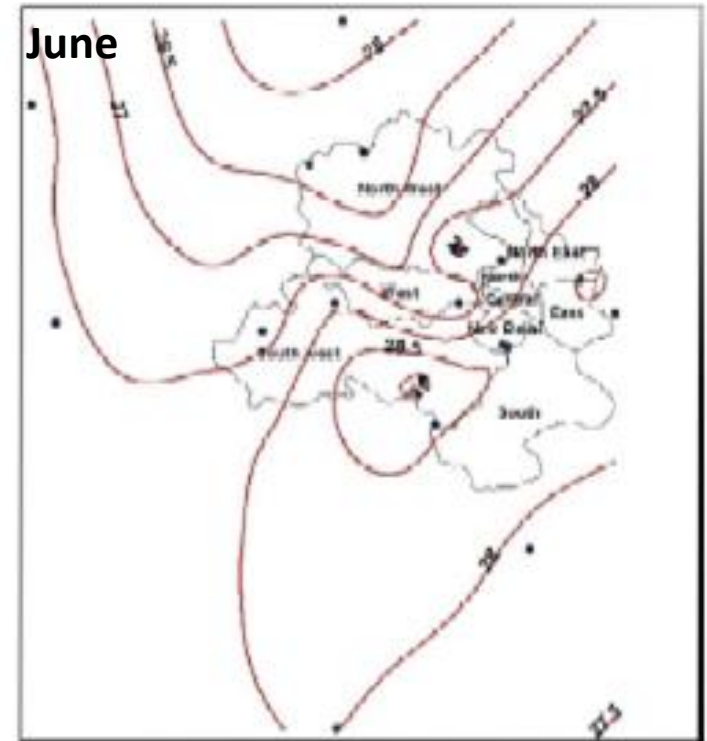
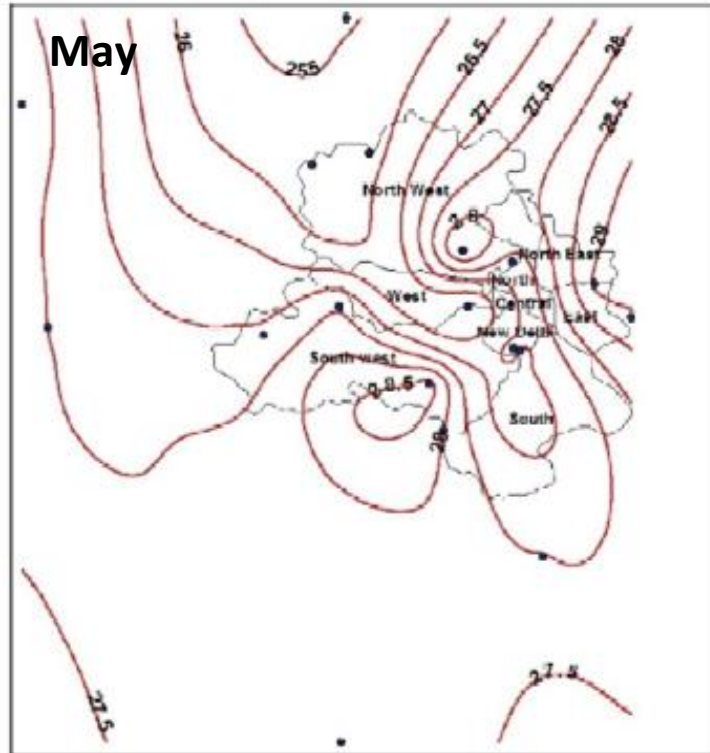


# Urban Heat Impact: Analysis over Delhi-NCR

Max. Temperature Isotherms

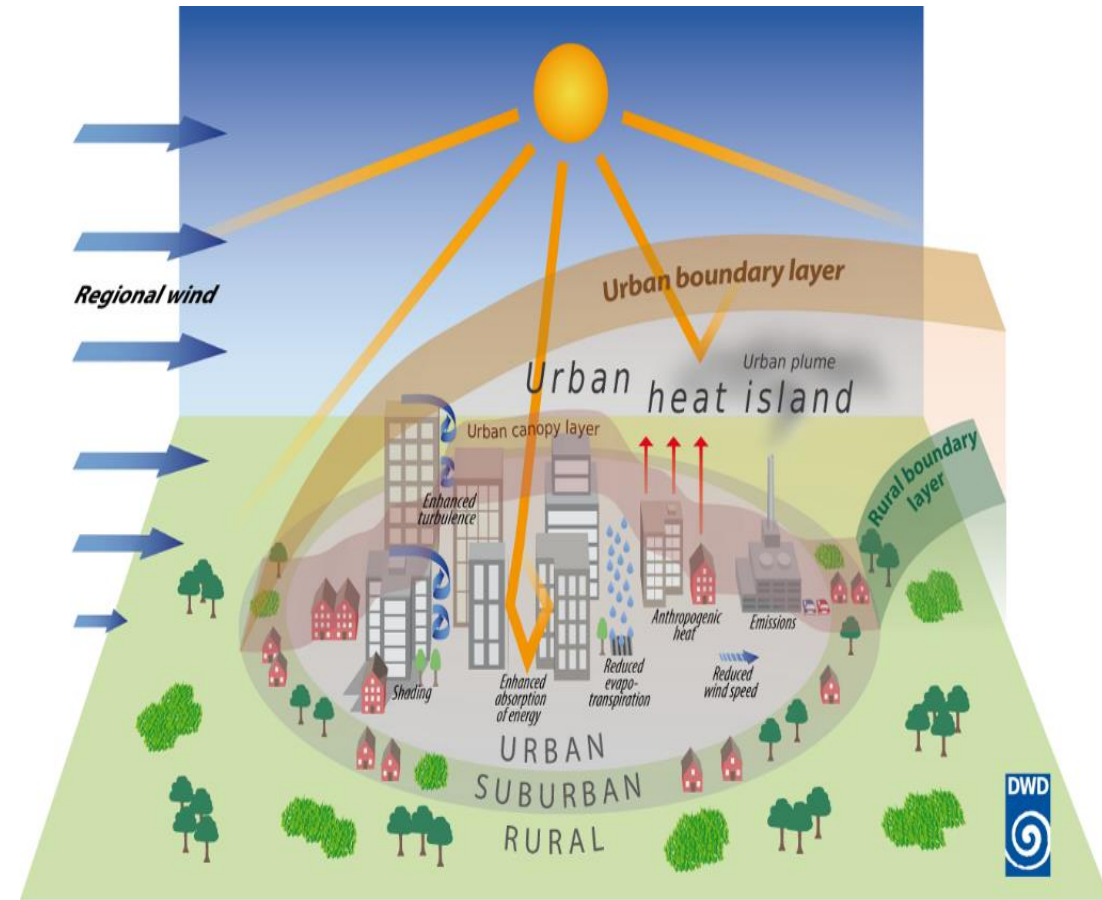


Min. Temperature Isotherms

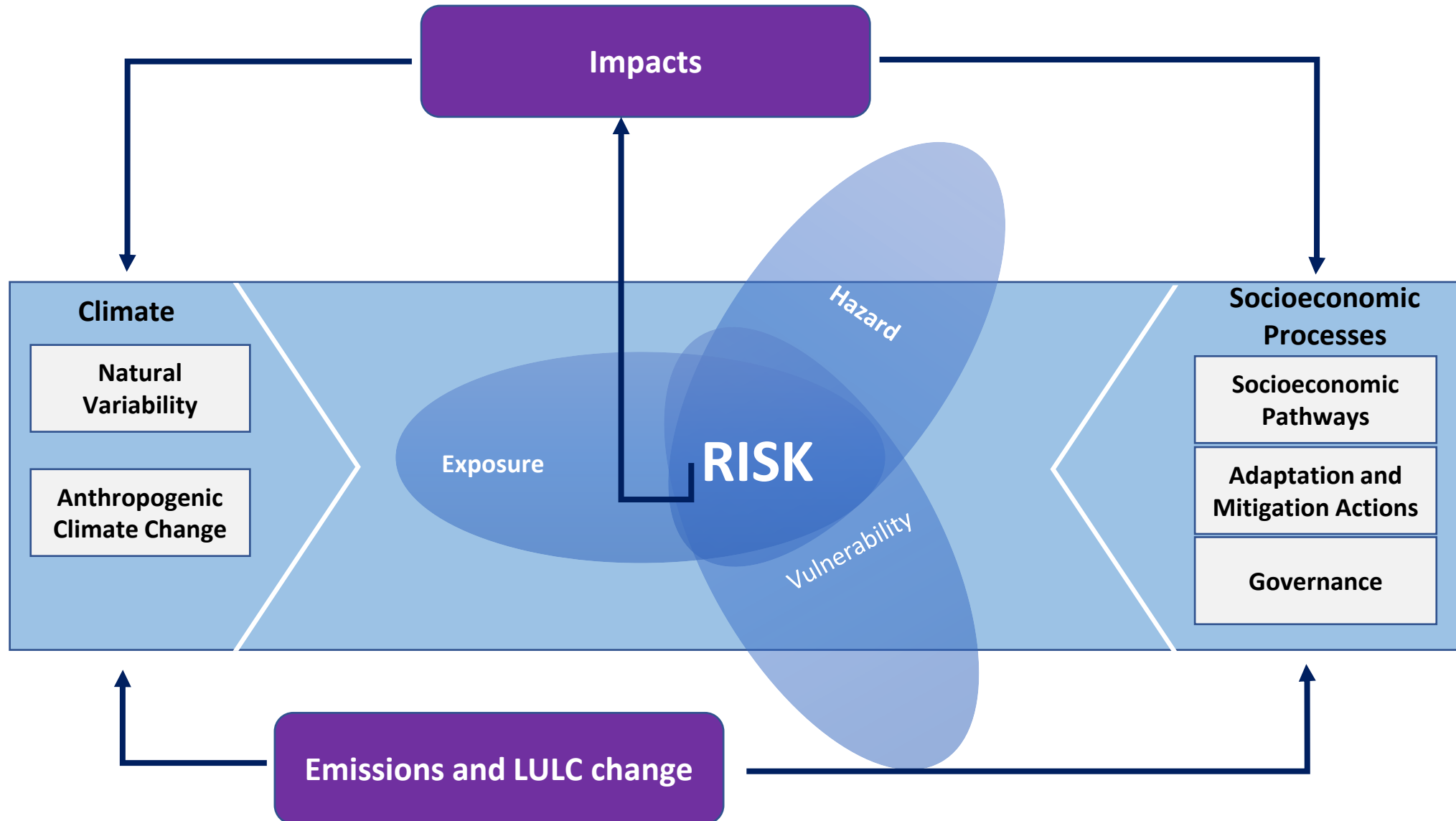


# Urban climate change

- Urban areas are home to over half of the world's people and are at the forefront of the climate change issue.
- Climate change exerts added stress on urban areas through increased numbers of **heat waves** threatening the health of the elderly, the infirm, and the very young; more frequent and **intense droughts and inland floods** compromising water supplies; and for coastal cities, enhanced **sea level rise and storm surges** affecting essential infrastructure, property, ecosystems, and inhabitants



# Urban climate framework



# Urban Meteorological Services of IMD

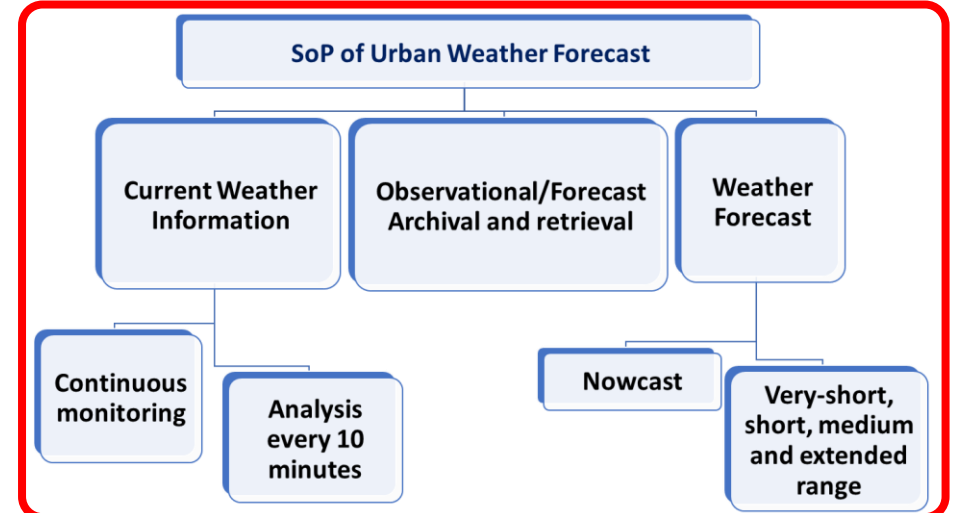
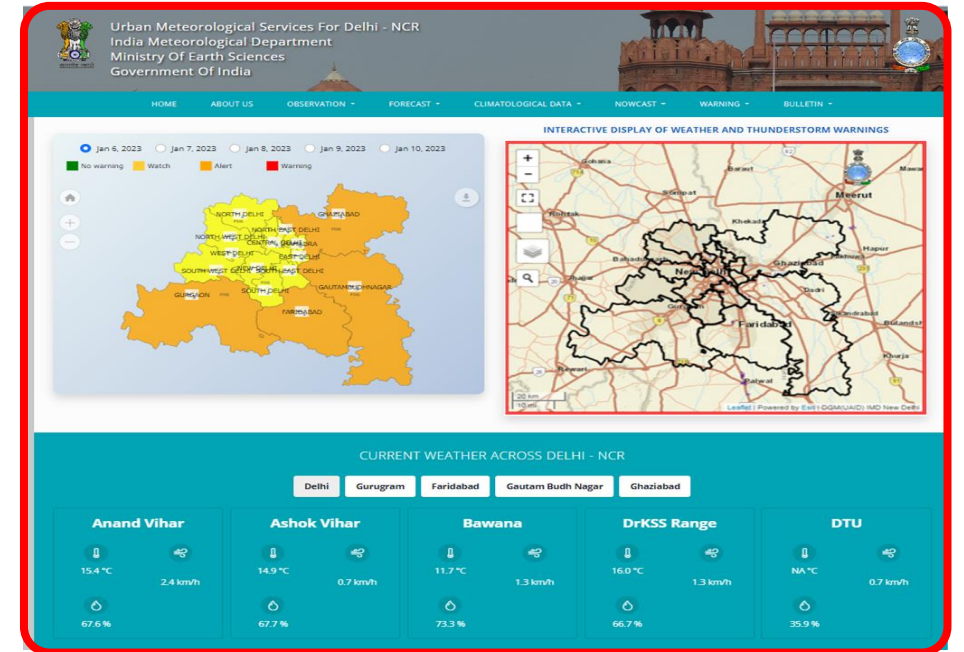
[https://internal.imd.gov.in/pages/city\\_weather\\_main\\_mausam.php](https://internal.imd.gov.in/pages/city_weather_main_mausam.php)

## Objectives:

Setting up High-Density Meso-network and high-resolution Modeling framework for major cities for Urban Flooding forecast, Heat action plan, and Pollution monitoring and forecasting [UMS is live for 54 cities]

## Activities:

- Location-specific Forecast for Capital Cities
- 7-Day Forecast of Smart and other Cities
- Nowcast
- Climate of Capital, Smart, and other cities
- Normal and Extreme Climate Data
- Outreach
- Integrated Flood Warning System
- Development of Urban Integrated forecasting and warning Service

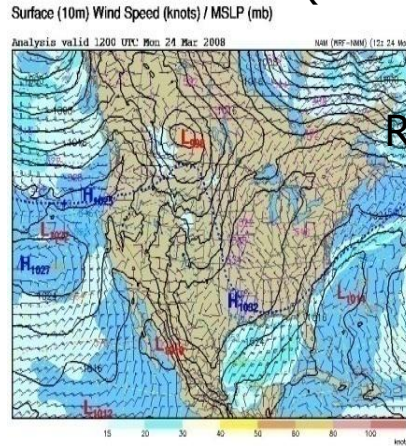


# The physical modeling system – A hierarchy of coupled scales

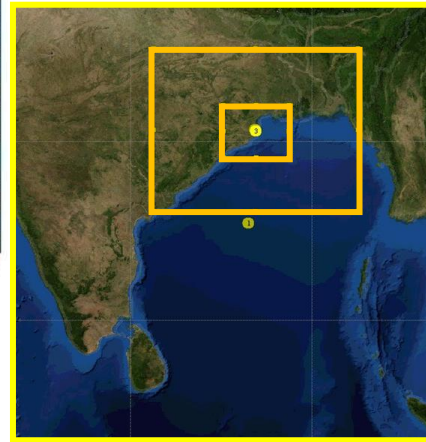
Global Scales (~50 km)



Continental Scales (~ 12 km)



Regional Scales (~9-3 km)



Local Scales (~ 1-3 km)



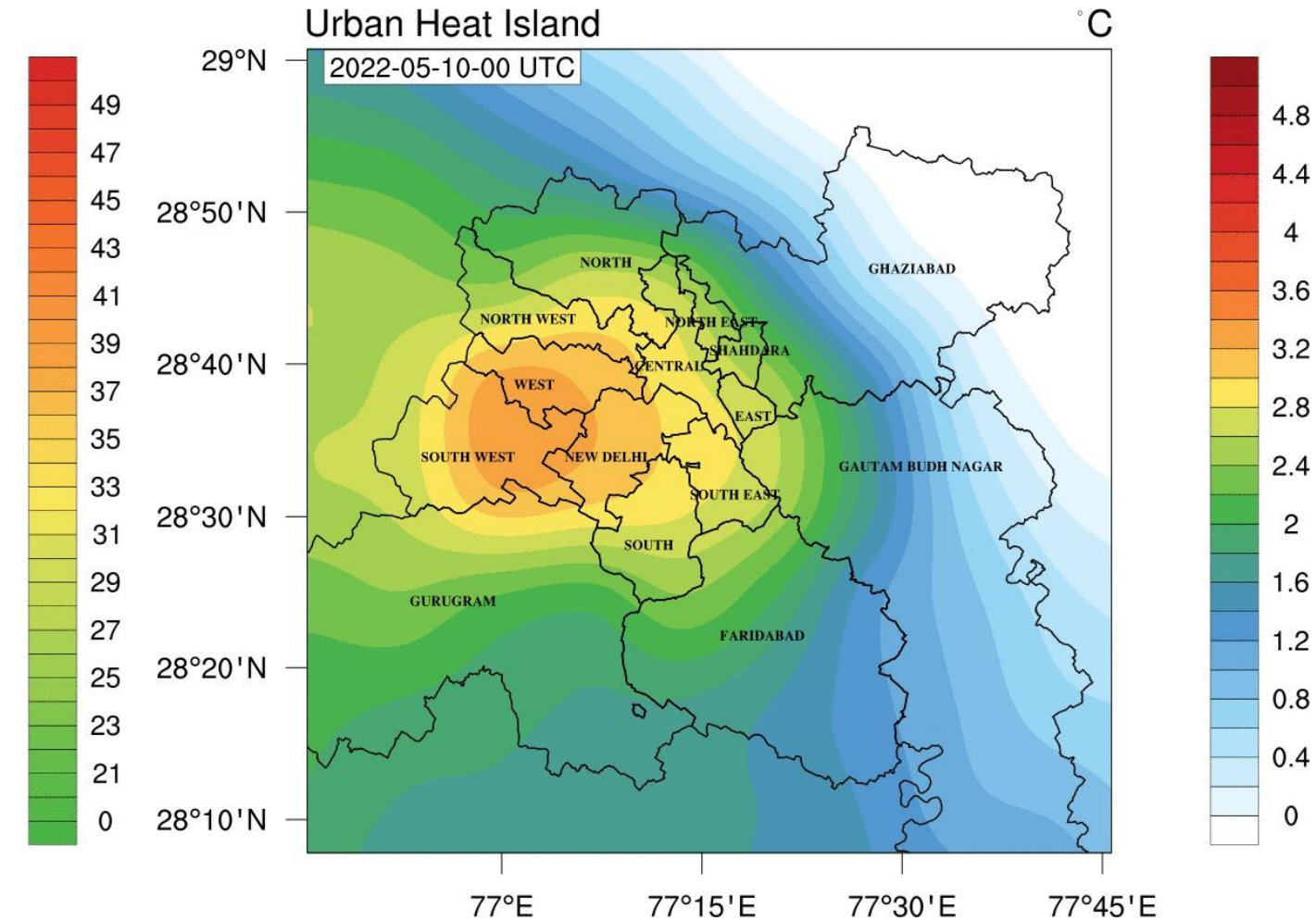
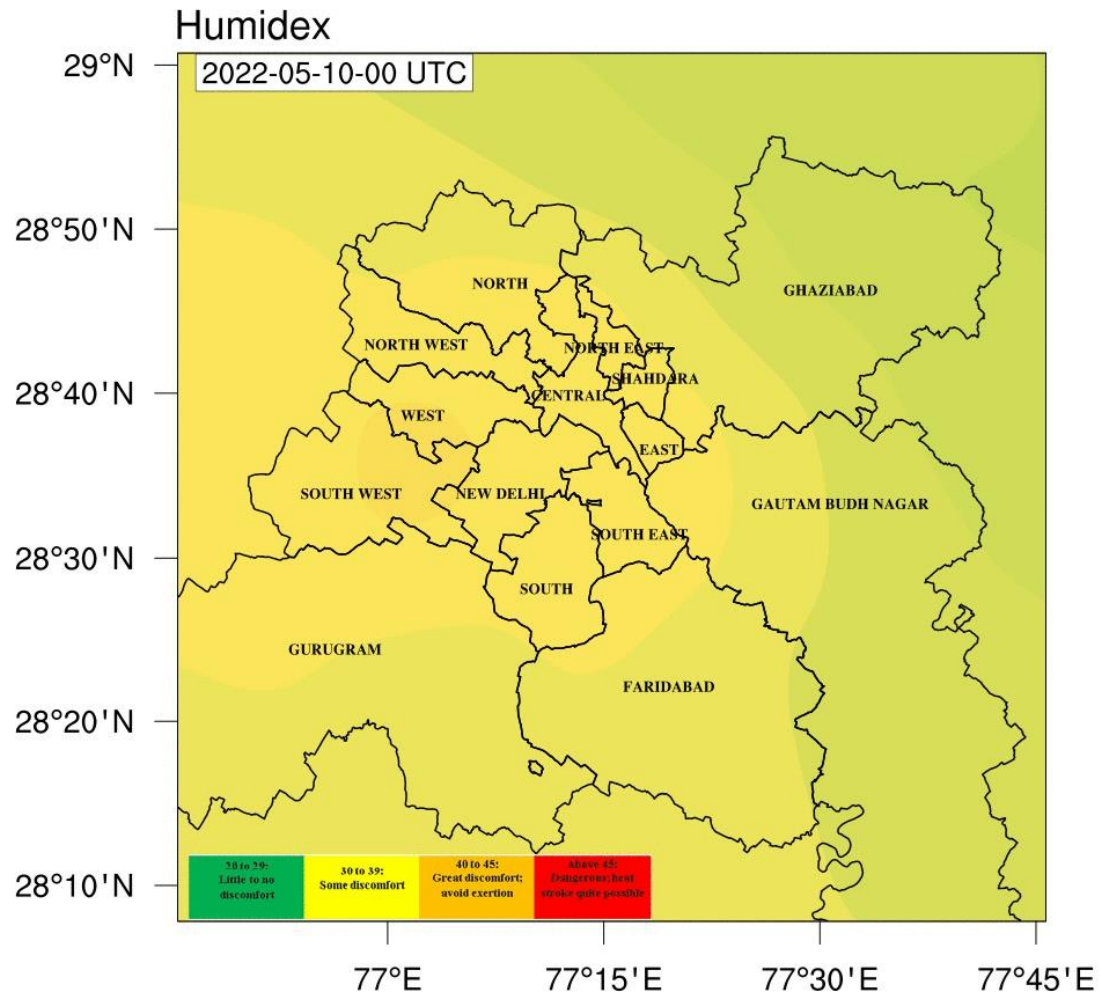
- High computational cost
- Non availability of fine scale observations and models
- high resolution surface data sets
- Scale interaction

City/ Urban Scales (~100 m)



Current status of operational weather and climate prediction

# Heat impact indices





# Heat Wave Warning

राष्ट्रीय मौसम पूर्वानुमान केन्द्र  
भारत मौसम विज्ञान विभाग  
पृथ्वी विज्ञान मंत्रालय



National Weather Forecasting Centre  
India Meteorological Department  
Ministry of Earth Sciences

## Current Temperature Status and Heat Wave Warning

Dated: 11<sup>th</sup> April, 2023  
Time of Issue: 1630 Hrs IST

### ♦ Observed Temperature Scenario:-

#### Maximum Temperature & its departure (Yesterday) (Annexure 1):-

- **Maximum temperatures** were in the range of 39-41°C over some parts of Gujarat and less than 39°C over rest parts of the country.
- **Yesterday's Highest Maximum Temperature on Plains:** 41.6°C at Rajgarh (West Madhya Pradesh).
- **Markedly above normal (5.1°C or more):-** At a few places over Assam & Meghalaya; at isolated places over Jammu, Kashmir, Ladakh, Gilgit, Baltistan & Muzaffarabad.
- **Appreciably above normal (3.1°C to 5.0°C):-** At many places over Nagaland, Manipur, Mizoram & Tripura and Sub-Himalayan West Bengal & Sikkim; at a few places over Konkan & Goa and Gangetic West Bengal; at isolated places over Bihar and Kerala & Mahe.
- **Above normal (1.6°C to 3.0°C):-** At many places over Himachal Pradesh, Gujarat region and Odisha; at a few places over West Rajasthan and Coastal Andhra Pradesh & Yanam; at isolated places over Saurashtra & Kutch.

#### Minimum Temperature & its departure (Today) (Annexure 2):-

- **Markedly above normal (5.1°C or more):-** NIL
- **Appreciably above normal (3.1°C to 5.0°C):-** At isolated places over West Rajasthan and Gujarat Region.
- **Above normal (1.6°C to 3.0°C):-** At a few places over Andaman & Nicobar Islands; at isolated places over Saurashtra & Kutch, West Madhya Pradesh and Gangetic West Bengal.

#### ♦ Heat wave conditions:-

NIL

#### ♦ Percentile Temperature (Annexure 3) :-

#### ♦ Temperatures Recorded at 1430 Hours IST of Today, the 11<sup>th</sup> April, 2023 (Annexure 4) :-

- Chandrapur(Vidarbha) recorded the highest temperature of 41.2°C.
- **24 hours Temperature change at 1430 hours IST of today:** Temperatures have risen between 1-3°C at most places over Madhya Pradesh, Vidarbha and Chhattisgarh and at some places over Haryana, Chandigarh & Delhi, West Uttar Pradesh and Marathawada.

#### ♦ Wind Speed & Relative Humidity Recorded at 1430 Hours IST of Today (Annexure 5) :-

#### ♦ Maximum Temperatures Forecast and Heat Wave warnings during next 5 days:-

- Maximum Temperatures are very likely to rise gradually by 2-4°C over many parts of the country.
- Heat wave conditions very likely in isolated pockets over coastal Odisha during 13<sup>th</sup> -15<sup>th</sup> April, 2023.

राष्ट्रीय मौसम पूर्वानुमान केन्द्र  
भारत मौसम विज्ञान विभाग  
पृथ्वी विज्ञान मंत्रालय



National Weather Forecasting Centre  
India Meteorological Department  
Ministry of Earth Sciences

## Heat Wave Warnings for Next 5 Days

DAY-1:- NIL

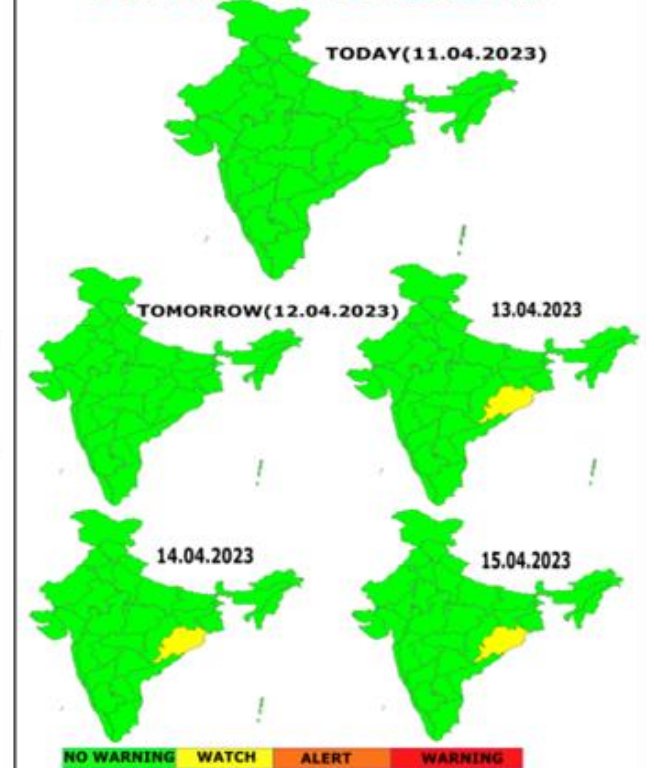
DAY-2:- NIL

DAY-3:- Heat Wave conditions very likely in isolated pockets over Odisha.

DAY-4:- Heat Wave conditions likely in isolated pockets over Odisha.

DAY-5:- Heat Wave conditions likely in isolated pockets over Odisha.

## 5 DAYS HEAT WAVE WARNING MAP



For Districtwise heat wave warning visit:

<https://mausam.imd.gov.in/responsive/districtWiseHeatwaveWarning.php>



# Thank You

**Please visit for country-wise/city-wise weather information**

**[https://internal.imd.gov.in/pages/city\\_weather\\_main\\_mausam.php](https://internal.imd.gov.in/pages/city_weather_main_mausam.php)**

**[https://internal.imd.gov.in/pages/heatwave\\_mausam.php](https://internal.imd.gov.in/pages/heatwave_mausam.php)**

**For any queries**

**Dr. V K Soni, Scientist-F and Head, Urban Meteorological Services,**

**Email: [vijay.soni@imd.gov.in](mailto:vijay.soni@imd.gov.in)**