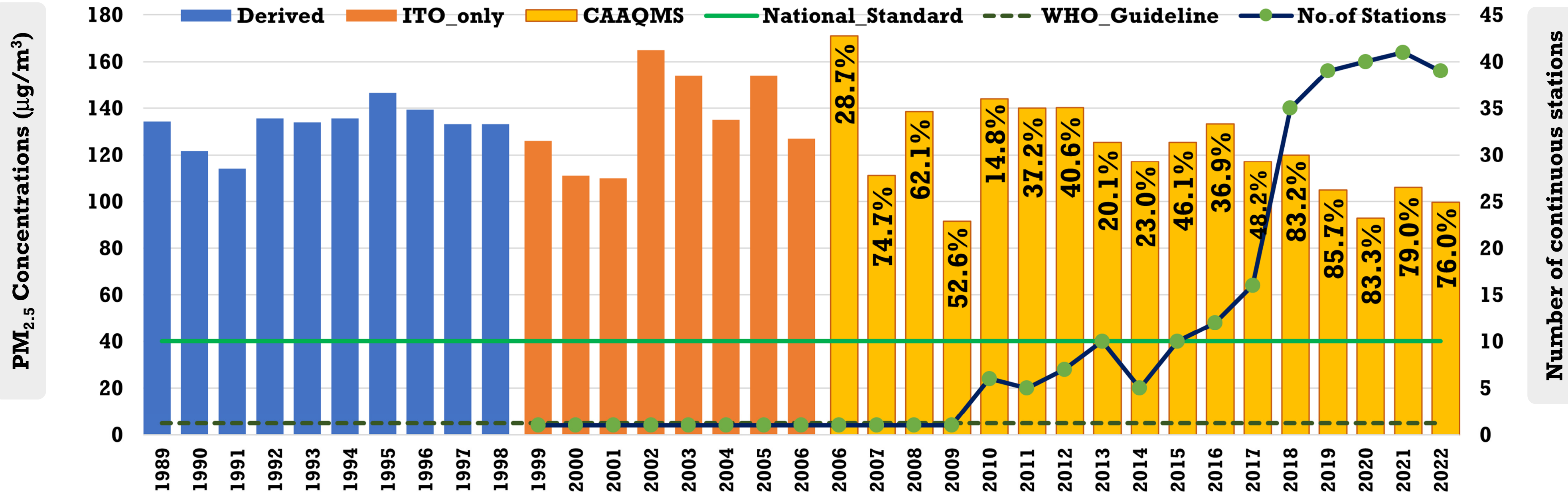


# WHAT IS POLLUTING DELHI'S AIR? REVIEW FROM 1990 to 2022

% value = % 15-minute data points available in that year

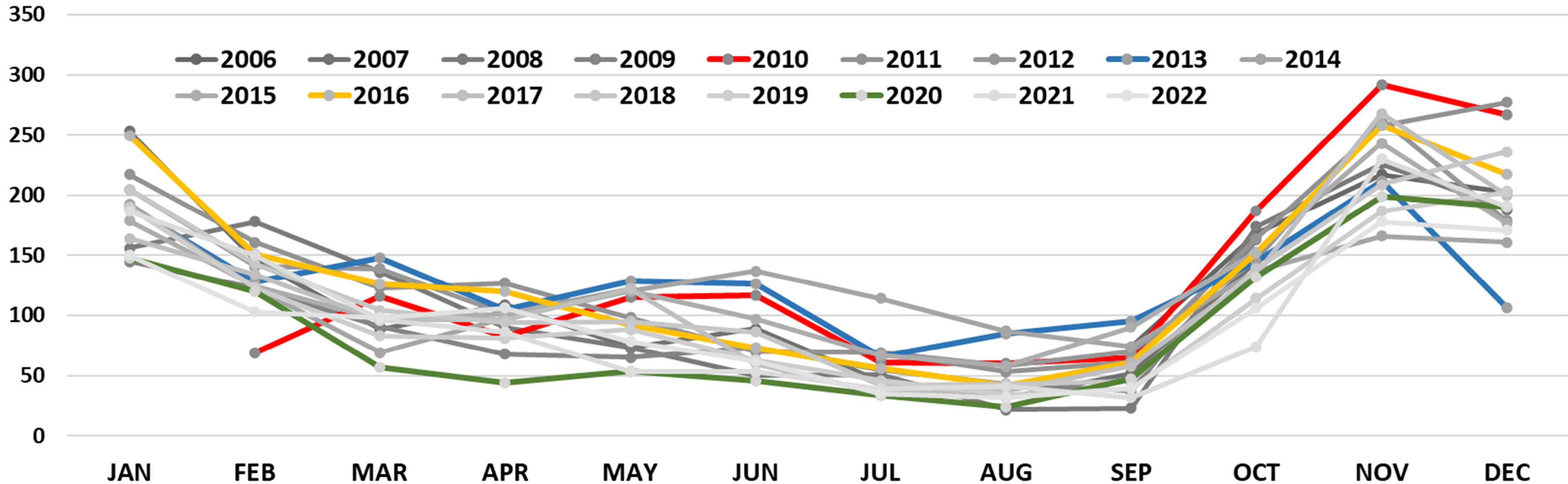


1989 to 1998 data is converted from PM10 concentrations from manual stations. Number of continuous stations measuring PM<sub>2.5</sub> in Delhi increased from 1 in 1999 to 2006 to 41 in 2021. Within 100km of NCR Delhi there are 70+ stations. Data availability every 15-min in 2019 is 85% -- more than double the average of 2013-17. Post-2018, data availability has been consistently above 80%

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>  
 Data sourced from <https://app.cpcbcr.com/ccr/#/caaqm-dashboard-all/caaqm-landing>

# WHAT IS POLLUTING DELHI'S AIR? REVIEW FROM 1990 to 2022

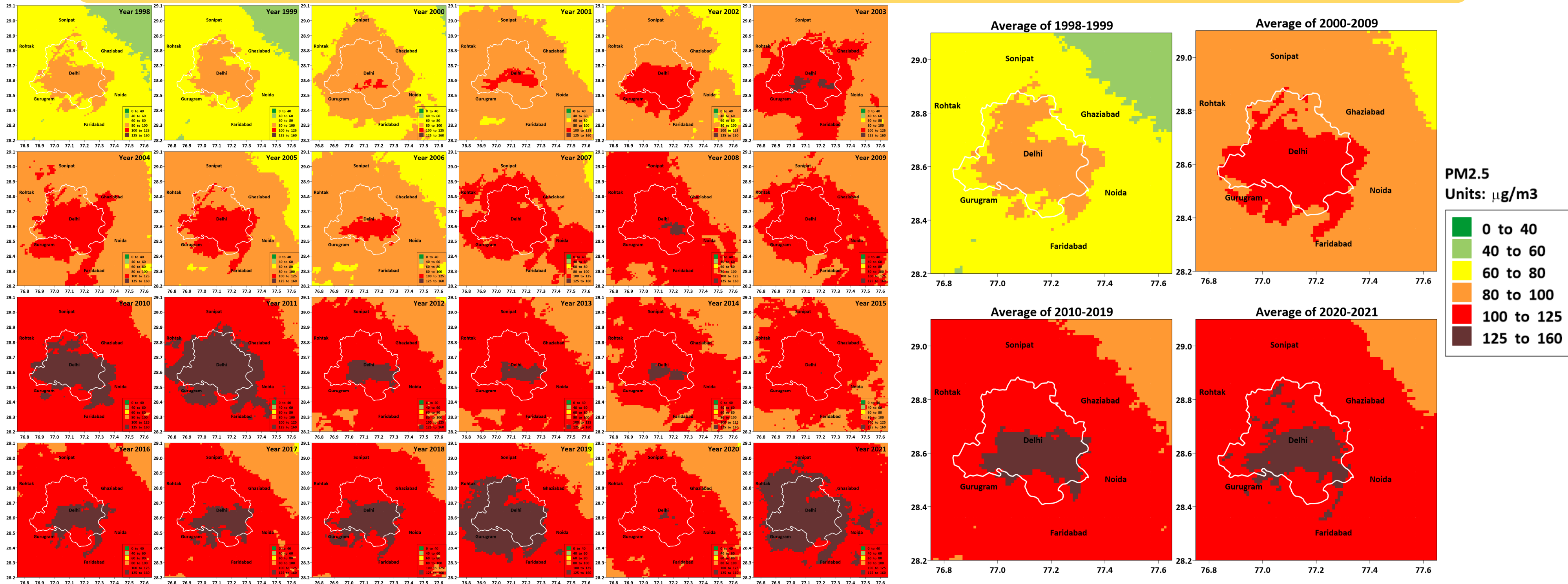
PM<sub>2.5</sub> Concentrations (µg/m<sup>3</sup>) from continuous monitoring station network



Number of continuous stations measuring PM<sub>2.5</sub> in Delhi increased from 1 in 1999 to 2006 to 41 in 2021. Within 100km of NCR Delhi there are 70+ stations. Data availability every 15-min in 2019 is 85% -- more than double the average of 2013-17. Post-2018, data availability has been consistently above 75%

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 Data sourced from <https://app.cpcbccr.com/ccr/#/caaqm-dashboard-all/caaqm-landing>

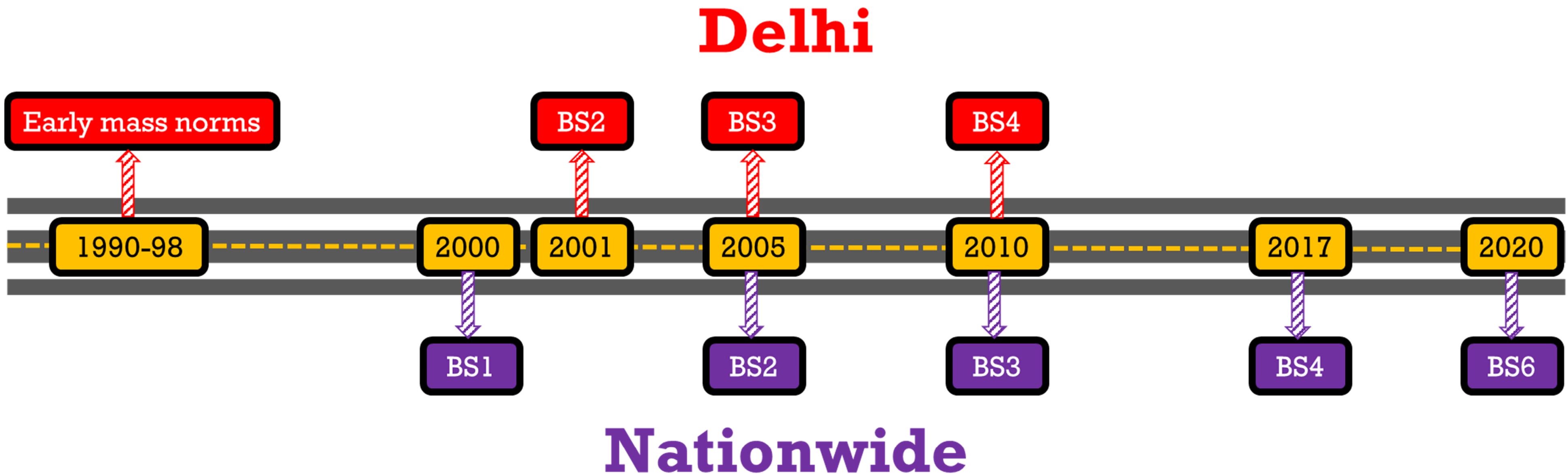
## Decadal change in annual average PM<sub>2.5</sub> concentrations



Raw data for these maps is extracted from reanalysis fields published by WUSTL

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

Fuel & vehicle (Bharat) standards were always introduced in Delhi 3-5 years earlier than nationwide



Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

Data sourced from <https://dieselnet.com/standards/in/#tab1>

## Summary of source apportionment studies for Annual PM<sub>2.5</sub>



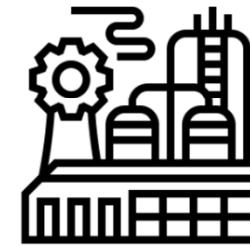
All transport  
10-30%

This includes all road, rail, and aviation modes and combustion of petrol, diesel, and gas.



All dust  
10-30%

This includes dust from resuspension on the roads and construction activities.



All industries  
10-30%

This includes all small, medium, and large industries, including power plants and brick kilns.



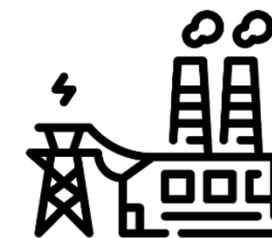
All Residential  
<10% in summer  
<30% in winter

This includes all cooking, lighting, and heating activities.



Waste burning  
5-15%

This includes all open waste burning at kerb and residential sides, and at the landfills.



Power plants  
<7%

This is mostly from power plants outside the city limits.



Dust storms  
<5%

This is a seasonal source.



Agricultural residue burning  
<3%

This is a seasonal source.



Firecrackers  
<1%

This is a seasonal source.

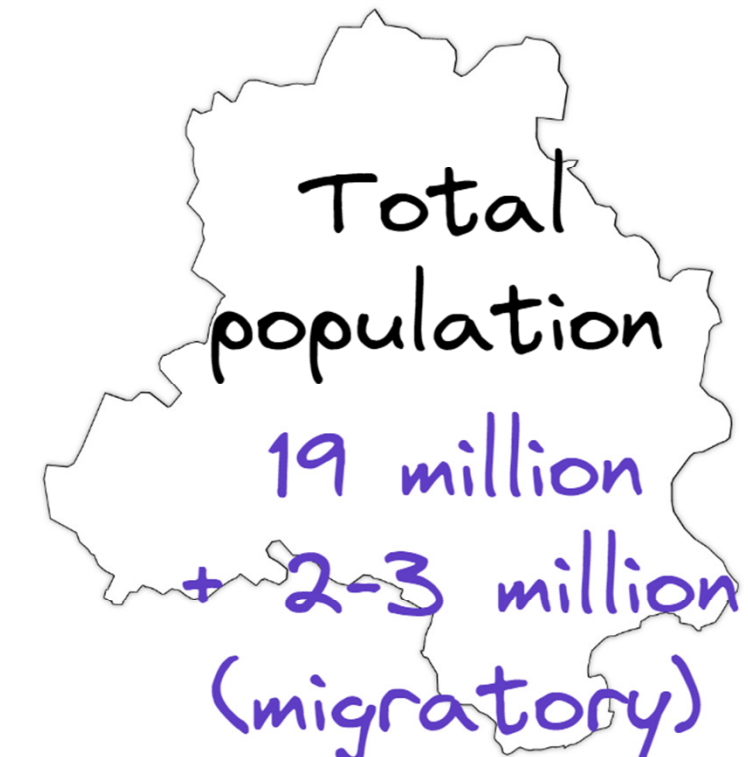
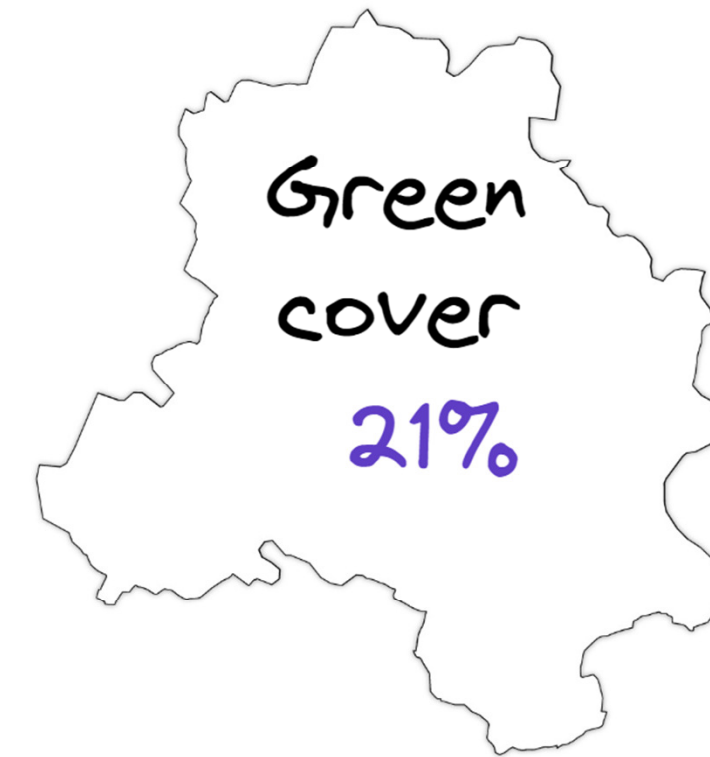
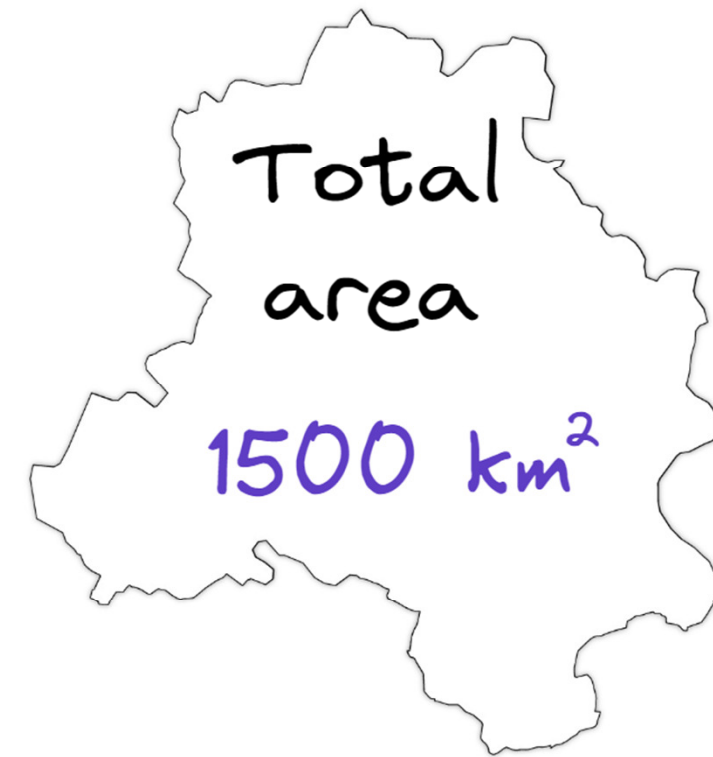
Earliest known results are from the 1997 White Paper on Delhi's air pollution by the Central Pollution Control Board.

The latest results in this pool are from 2023 real time source apportionment experiment by the Delhi Pollution Control Committee on their premises.

Majority of the results follow the filter sampling, chemical analysis, and receptor modeling method.

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

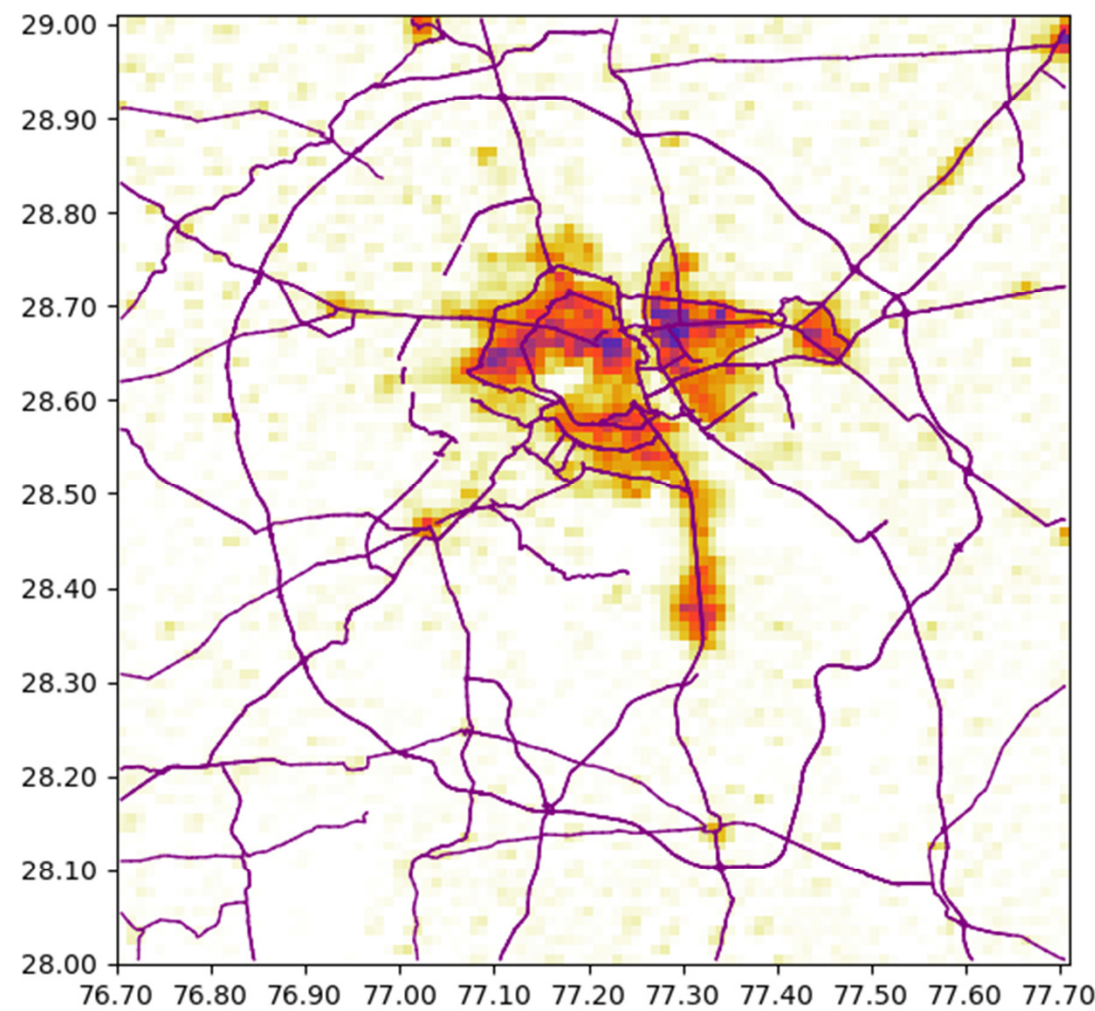
## Geography & Population



Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

## Change in Urban Built-up Area

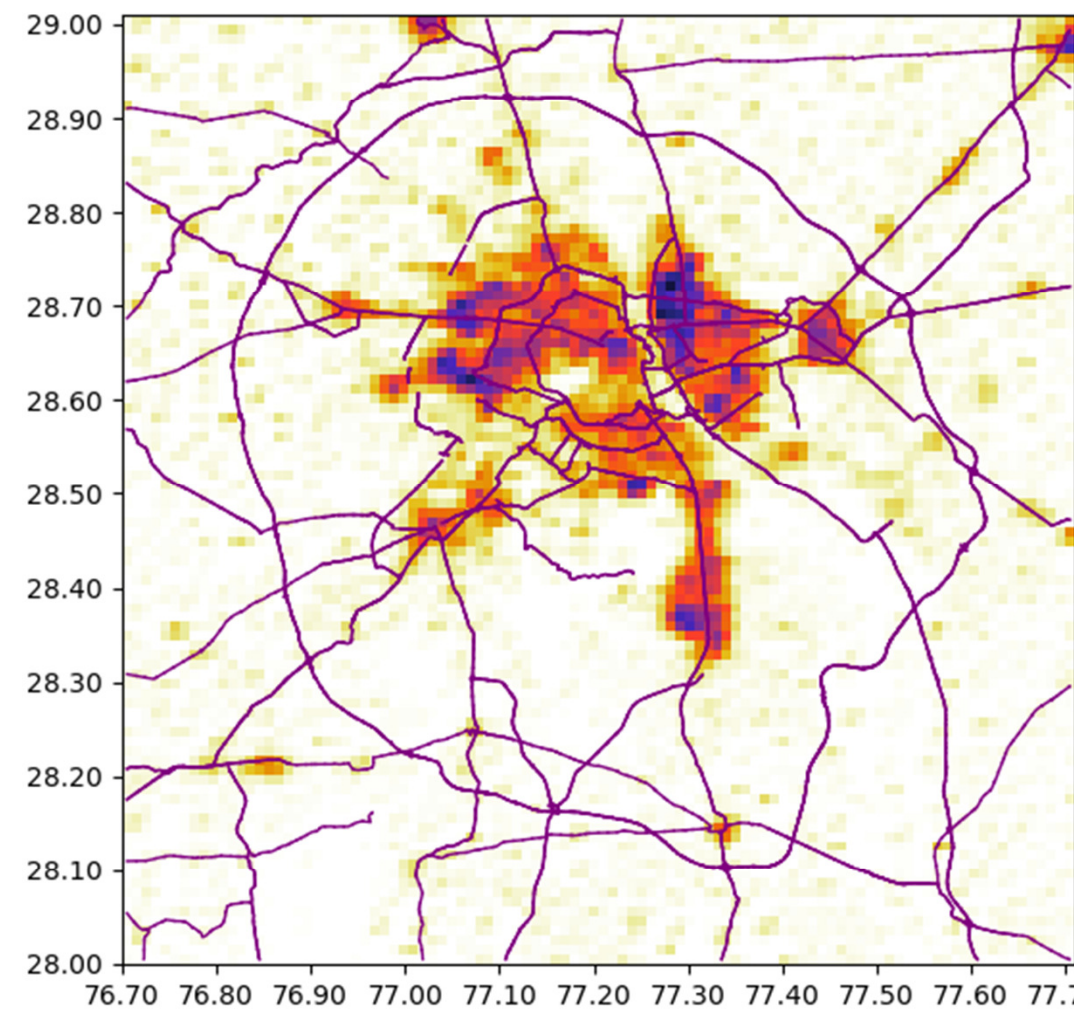
Delhi, DL 1975



India NCAP city information database

Data from ESA-GHS program & Grid details @ <https://urbanemissions.info>

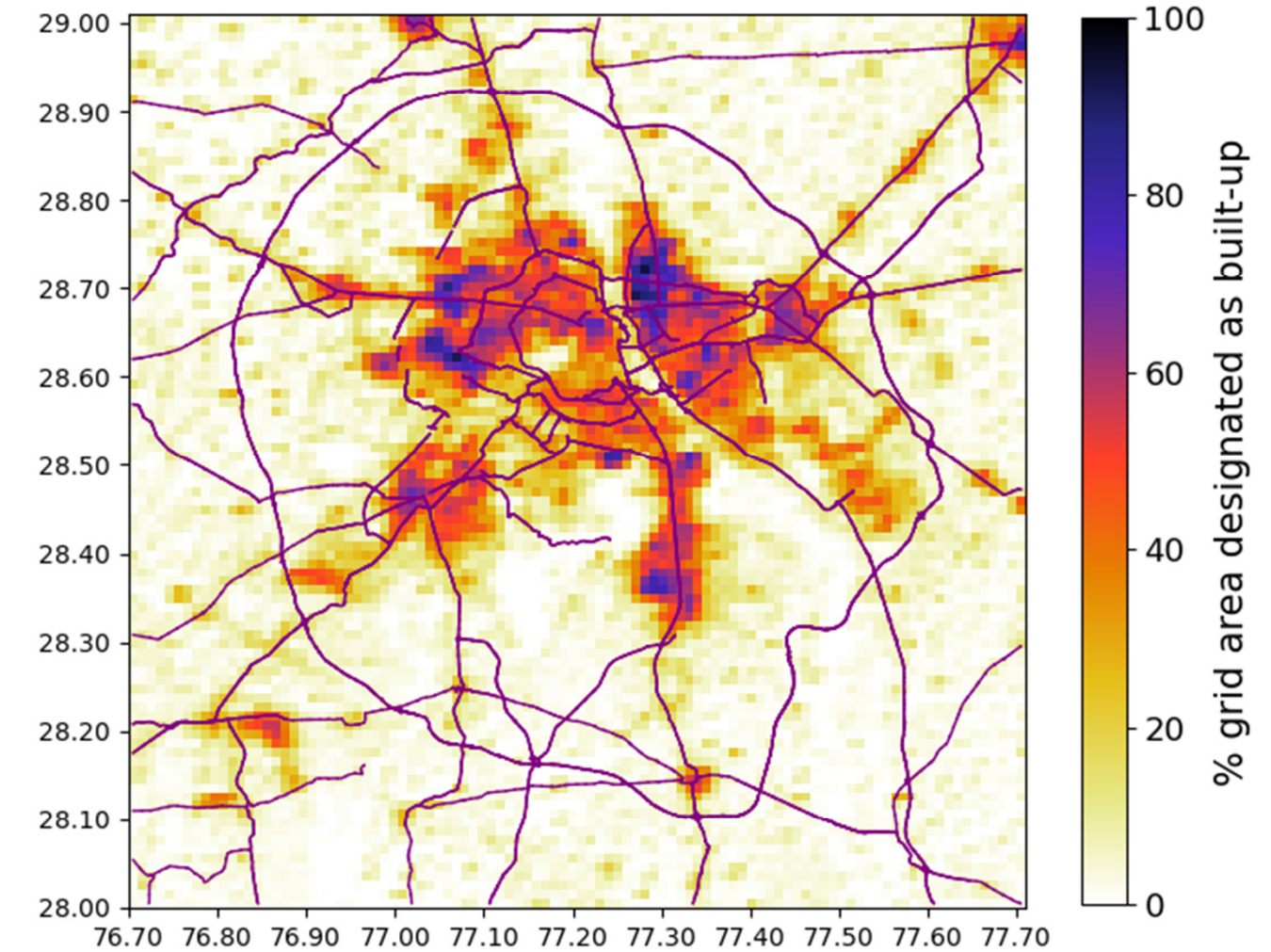
Delhi, DL 1990



India NCAP city information database

Data from ESA-GHS program & Grid details @ <https://urbanemissions.info>

Delhi, DL 2020



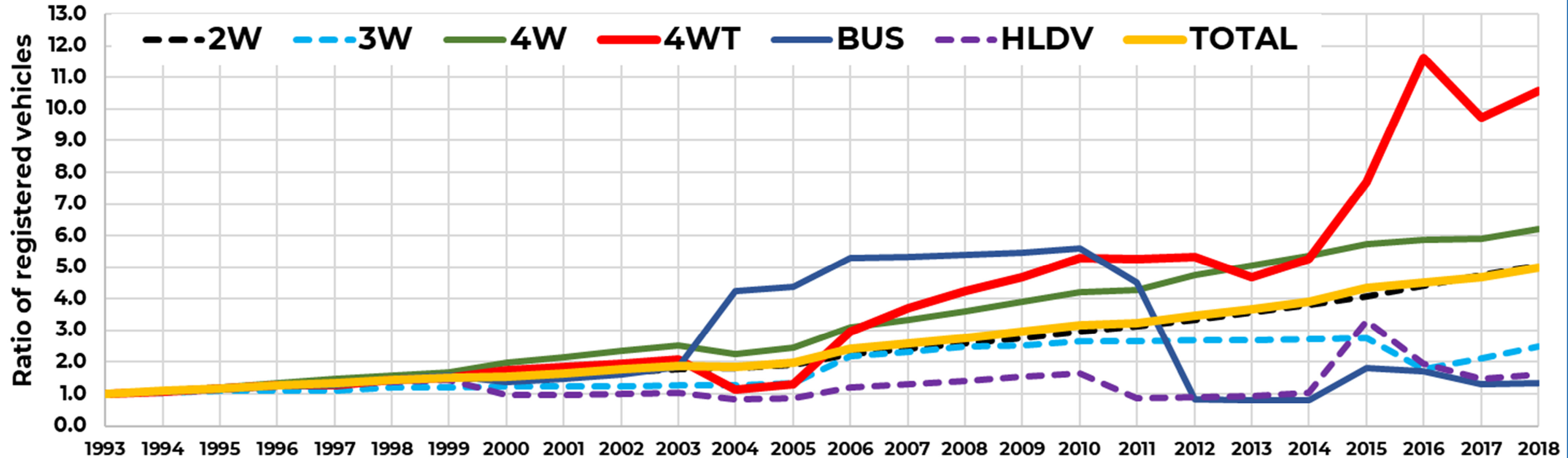
India NCAP city information database

Data from ESA-GHS program & Grid details @ <https://urbanemissions.info>

Raw data for these maps is extracted from EU-Global Human Settlements program

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

## Growth in registered vehicles as a ratio to 1993

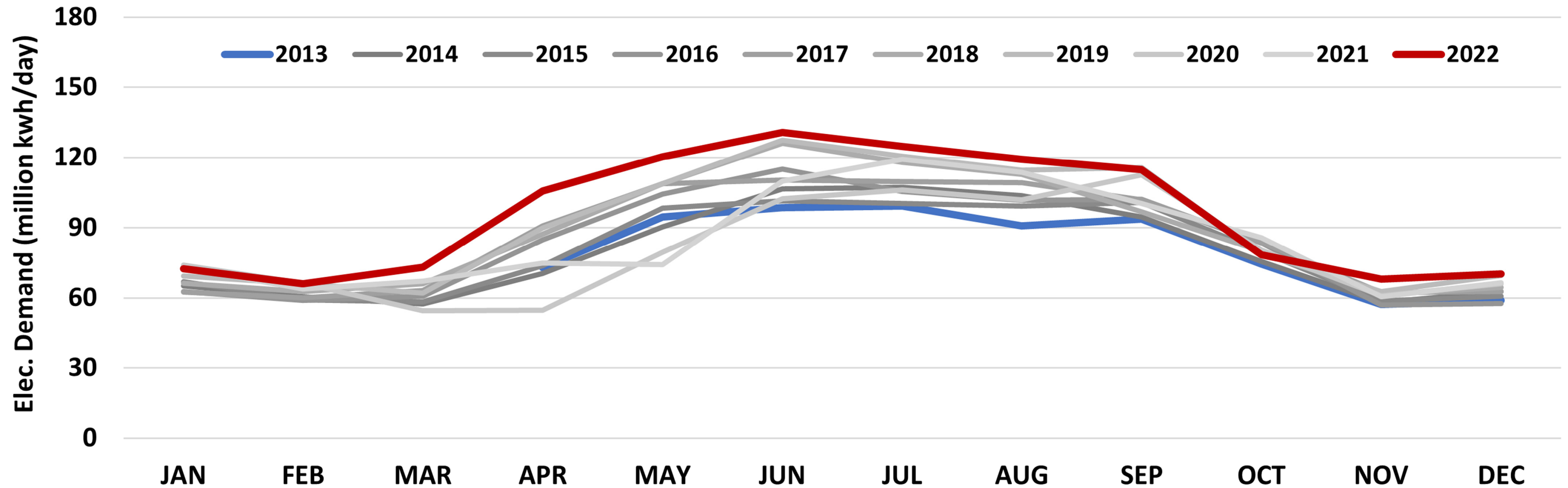


Raw data for this statistics is collected from the annual reports of the Ministry of Road Transport and Highways (via indiastats)

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>



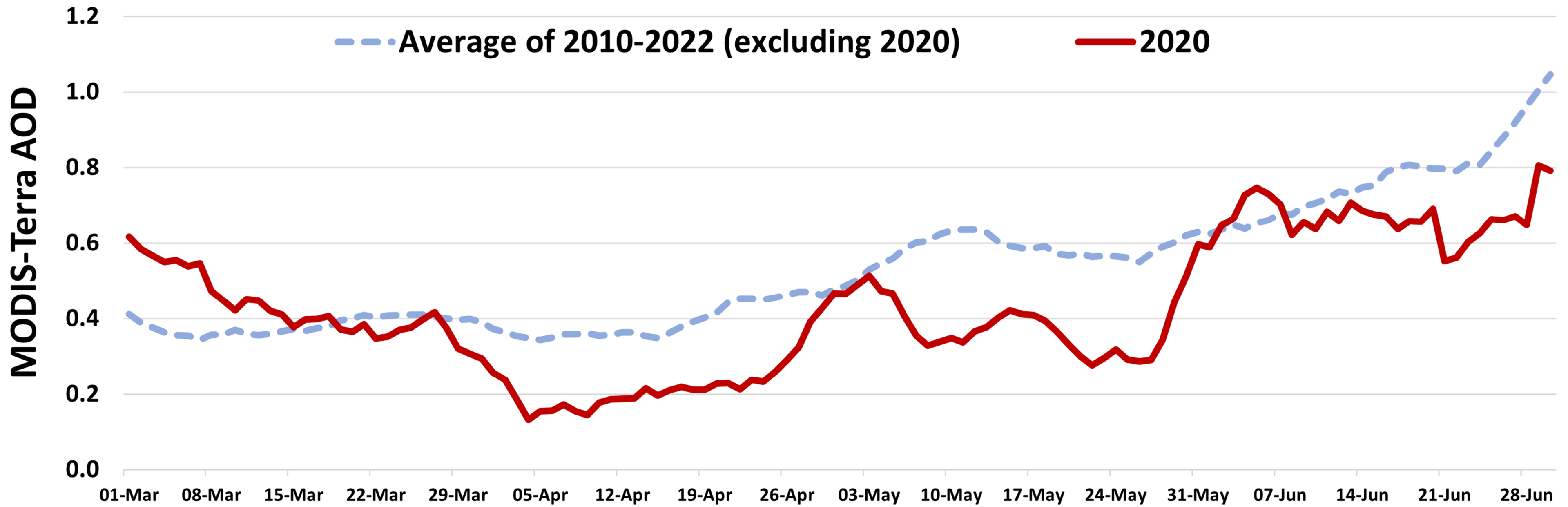
## Monthly electricity demand in Delhi



Raw data is collected from National Power Portal (NPP) and Grid Controller of India Ltd.

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

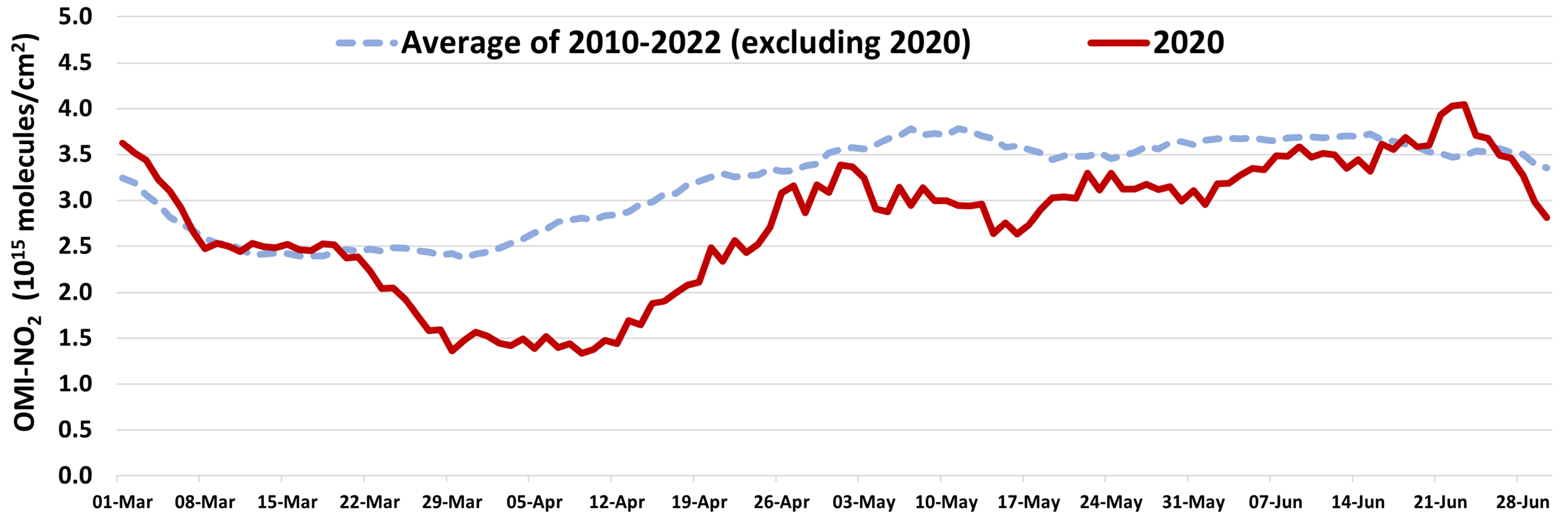
## Impact of COVID19 lockdowns on AOD over Delhi



Raw data is extracted from NASA GIOVANNI data repository

Detailed paper is published @ MDPI Sustainability: <https://www.mdpi.com/2071-1050/15/5/4209>

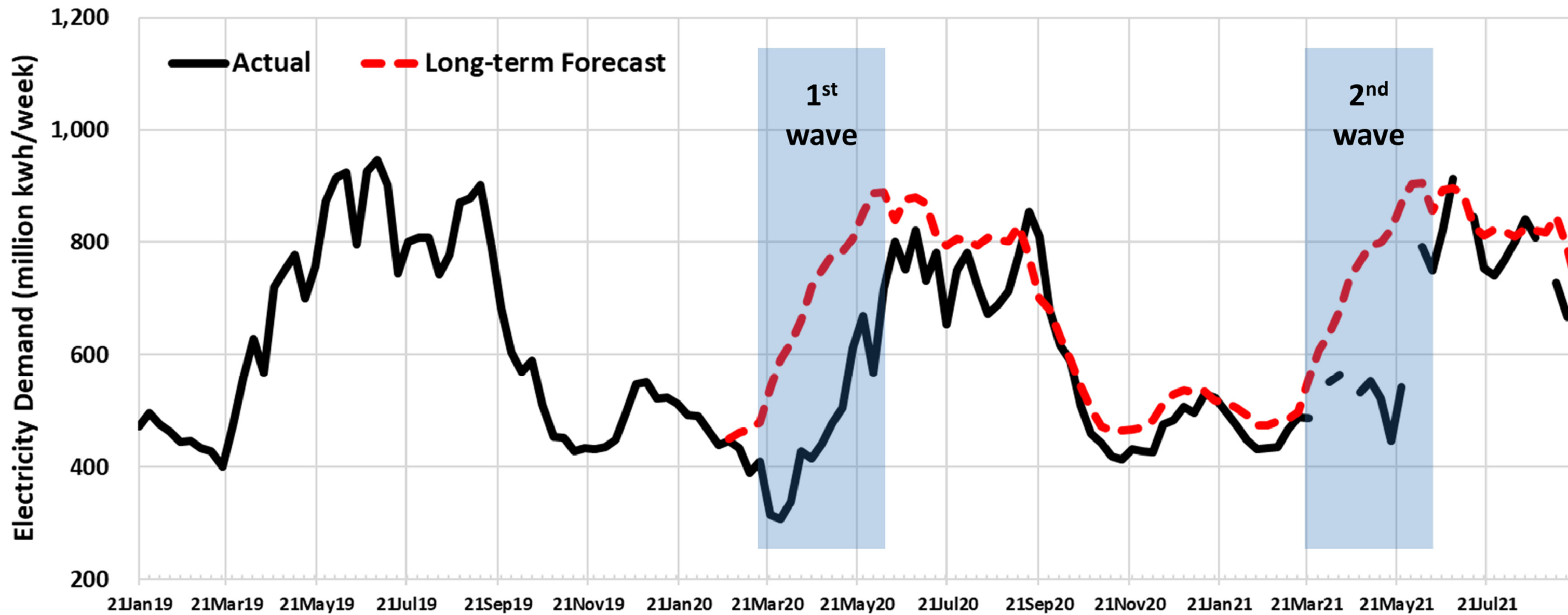
## Impact of COVID19 lockdowns on Columnar NO<sub>2</sub> over Delhi



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## Impact of COVID19 lockdowns on electricity demand in Delhi



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