

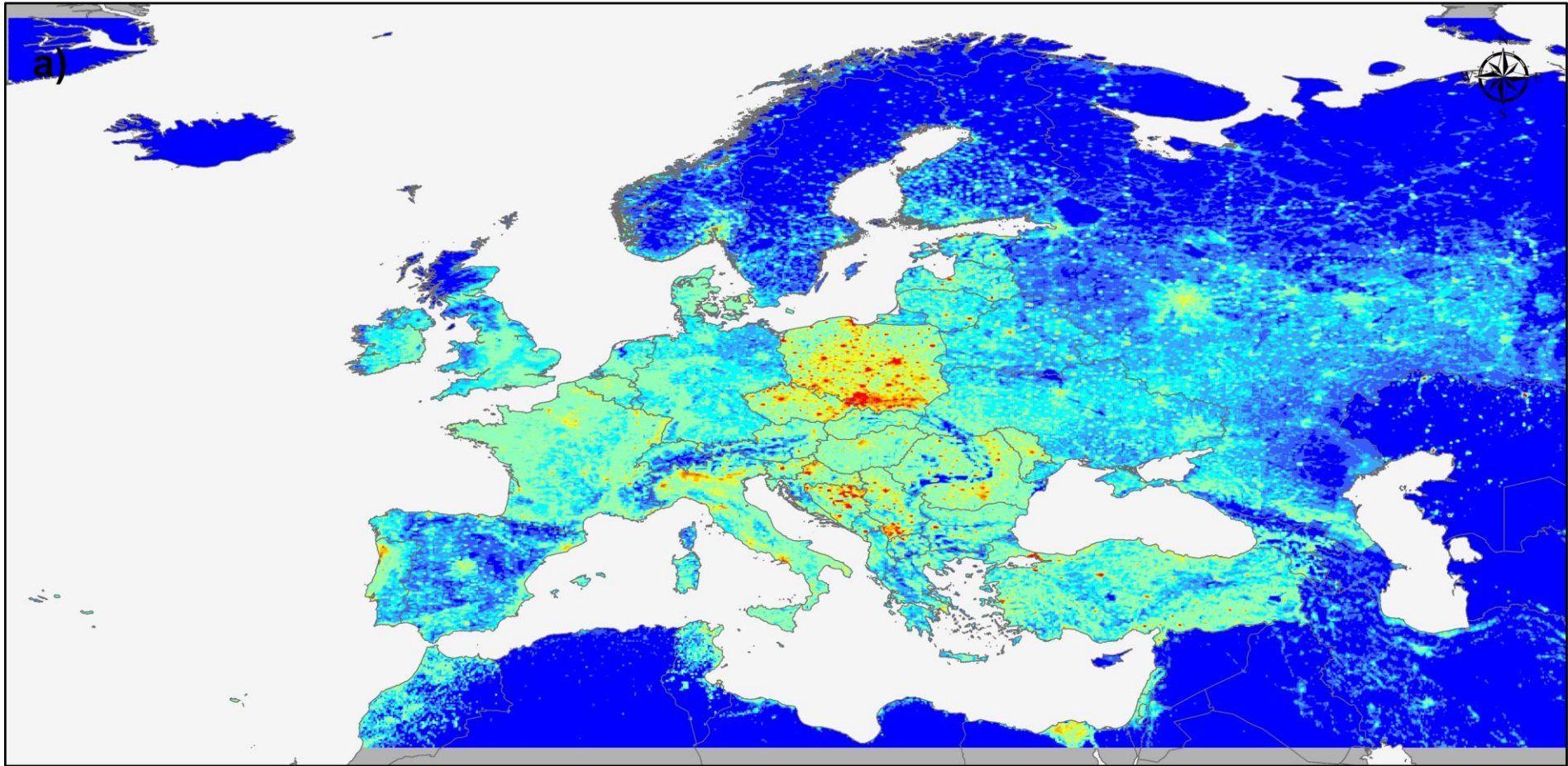
AtmoSTEM

A high-resolution spatiotemporal emission model for urban air quality applications

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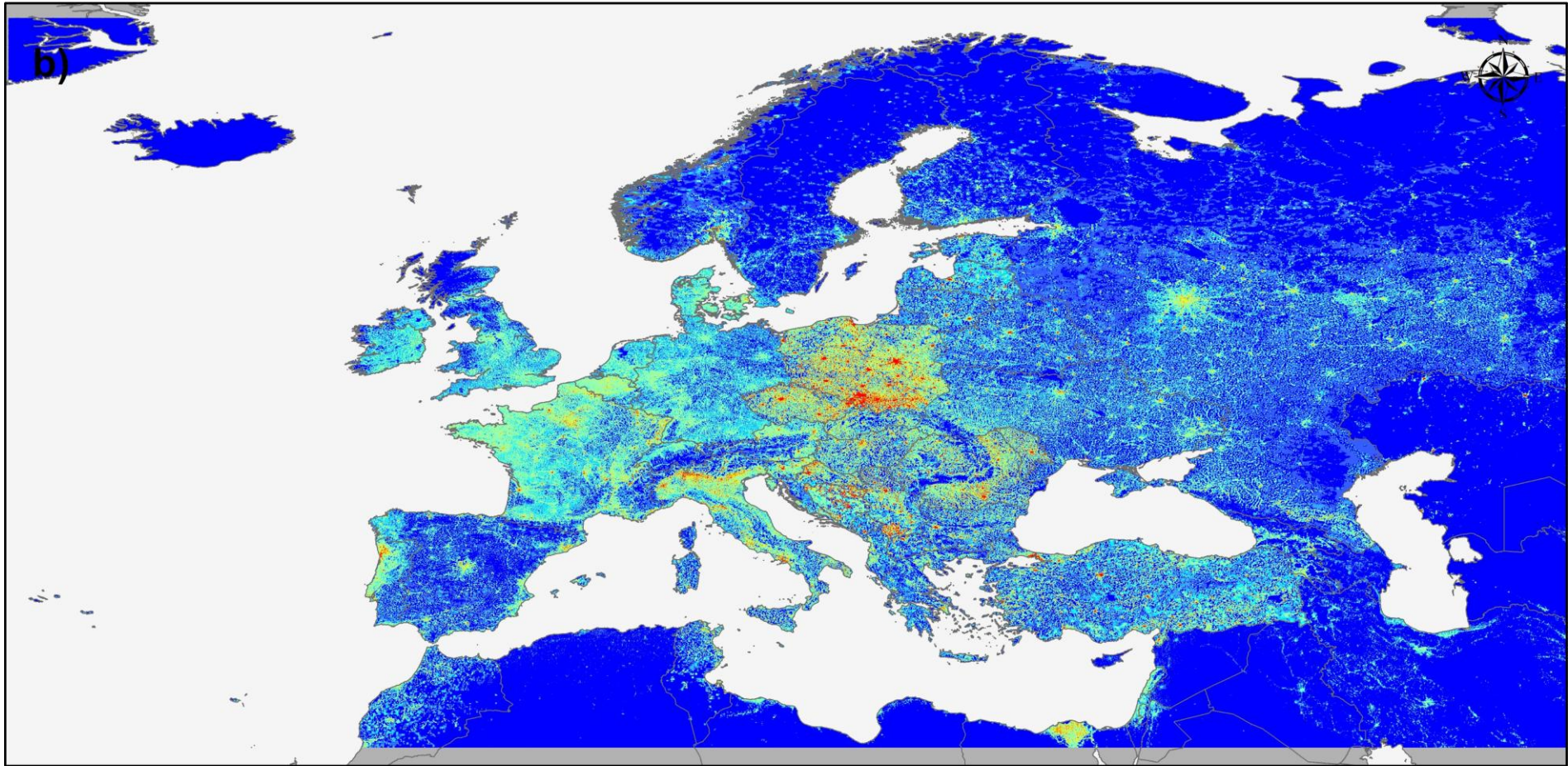
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2. University of Ioannina, Department of Physics, Greece,
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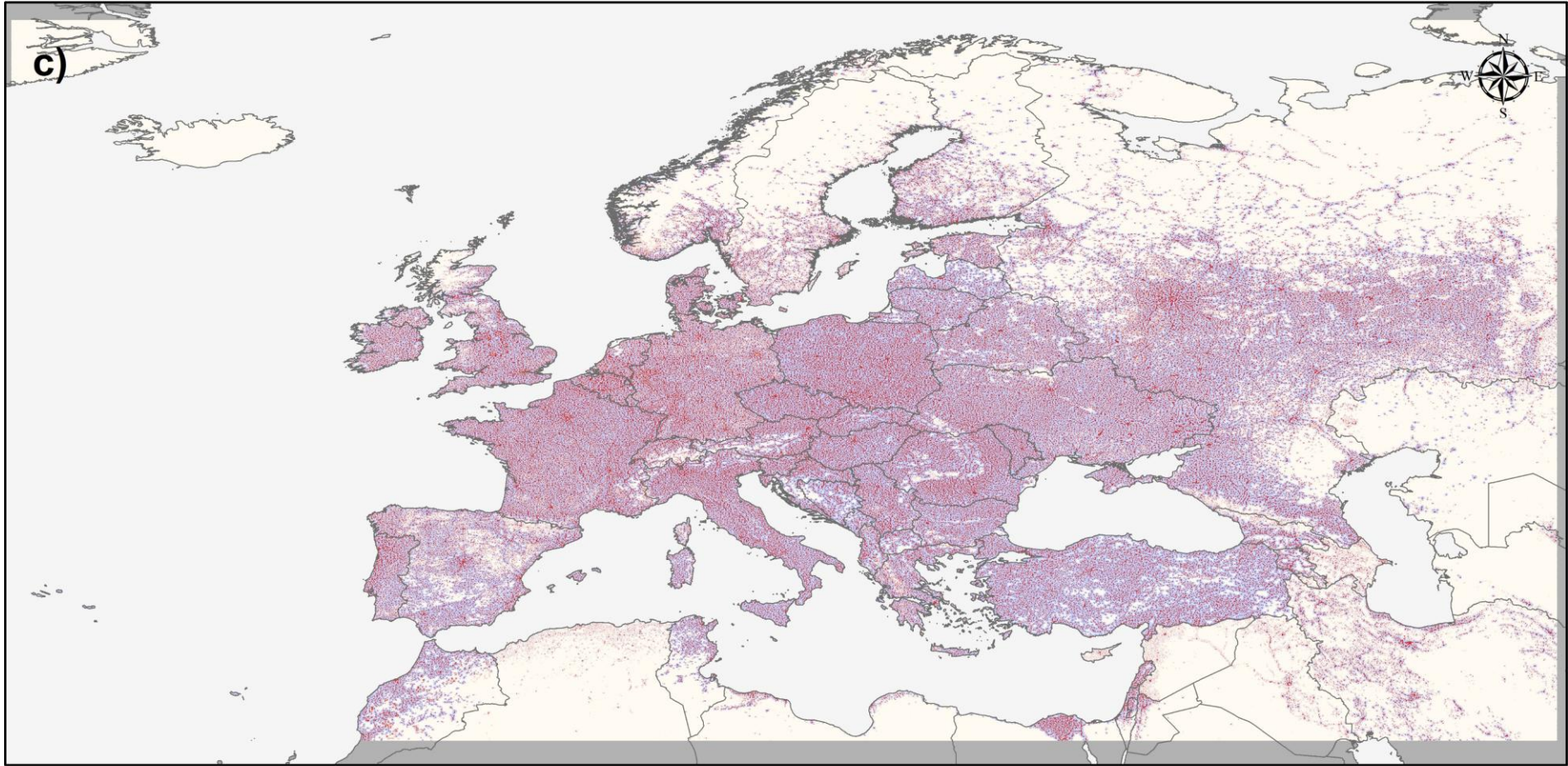
Mean annual PM_{2.5} emissions (kg × yr⁻¹ km⁻²) - Residential heating sector (GNFR C), CAMS (2015 - 2024)





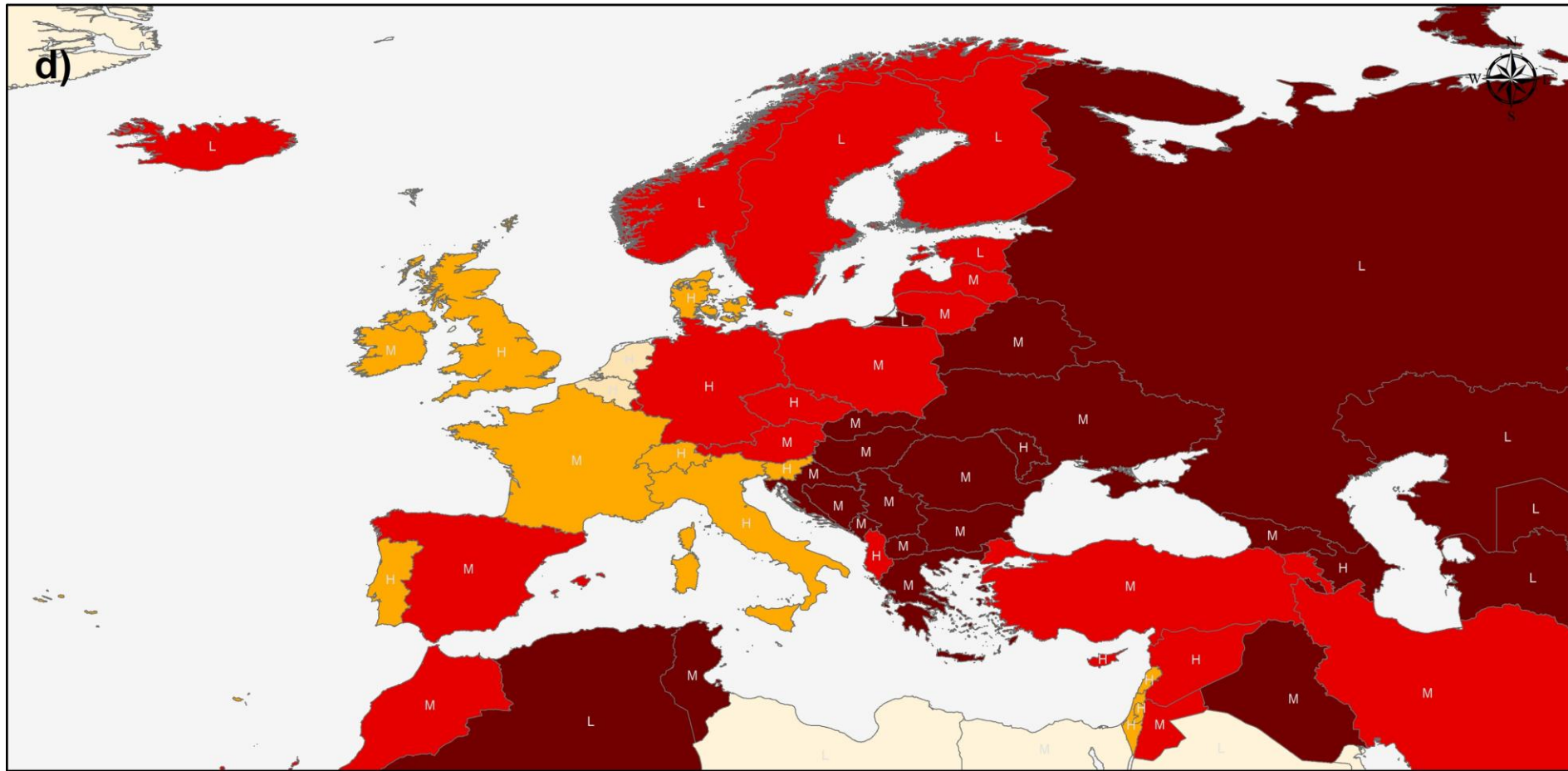
Mean annual PM_{2.5} emissions (kg × yr⁻¹ km⁻²) - Residential heating sector (GNFR C), AtmoSTEM (2015 - 2024)





**Mean annual PM_{2.5} emissions difference (AtmoSTEM - CAMS),
from residential heating (GNFR C) in Europe (2015 - 2024)**

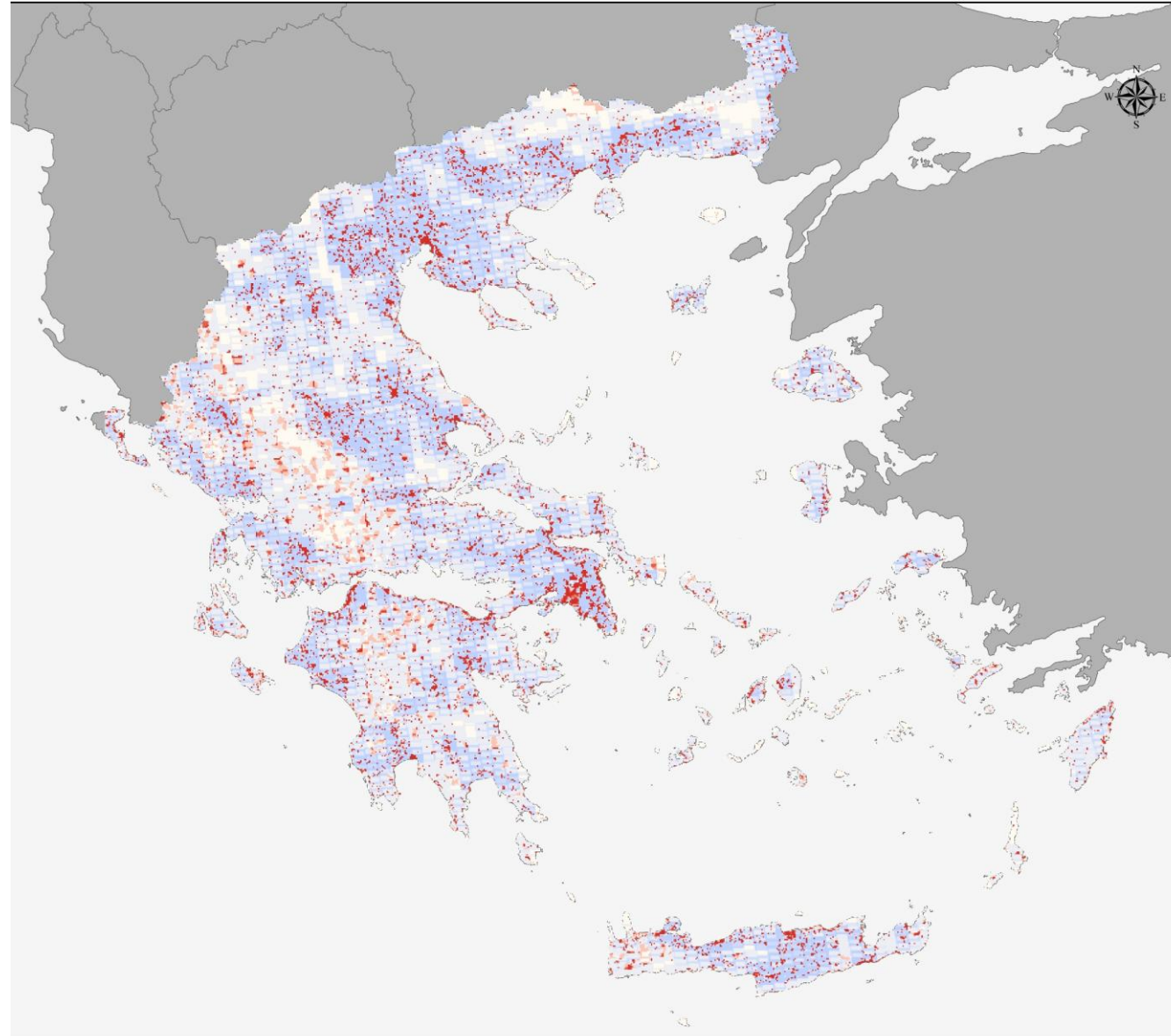




Mean annual PM_{2.5} emissions difference (AtmoSTEM - CAMS), based on populated cells (%), from residential heating (GNFR C) in Europe (2015 - 2024)



Country types based on terciles of populated-cell share (%): Low (L): < 3.7%, Medium (M): 3.7 - 10.1%, High (H): > 10.1%

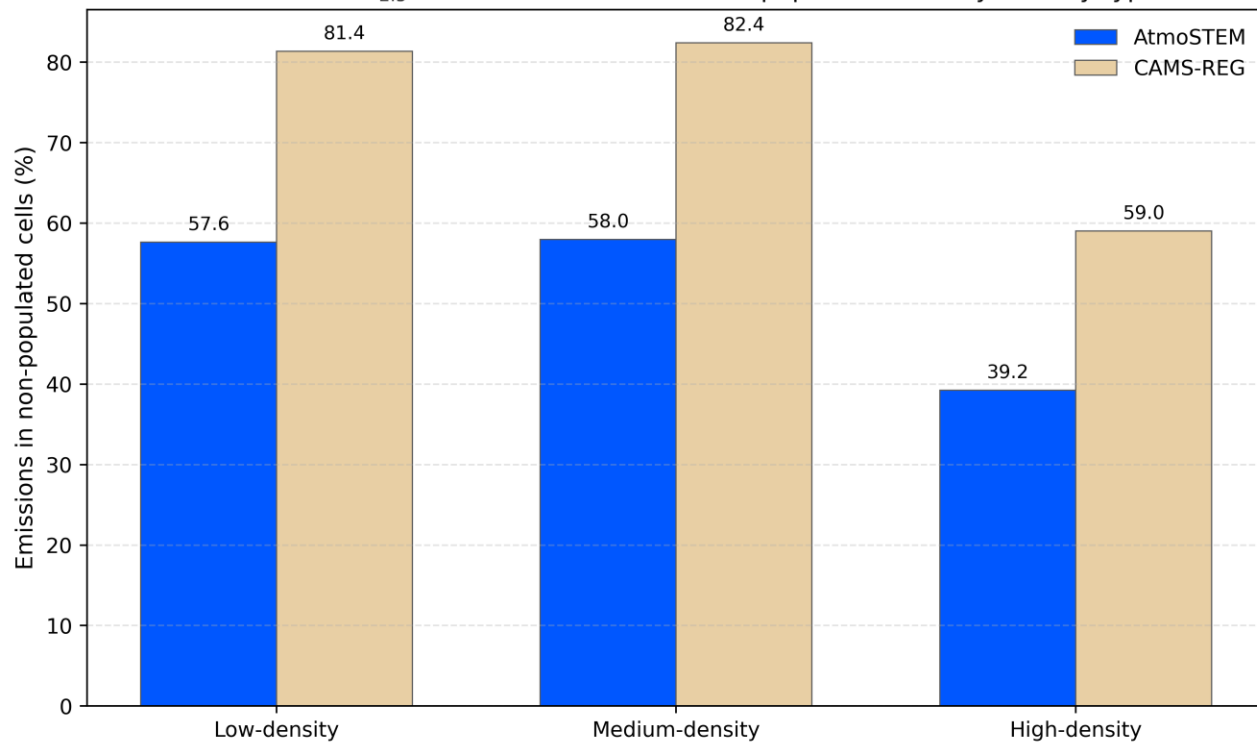


Mean monthly PM_{2.5} emissions difference (AtmoSTEM - CAMS), from residential heating (GNFR C) in Greece (Oct - Apr, 2015 - 2024)

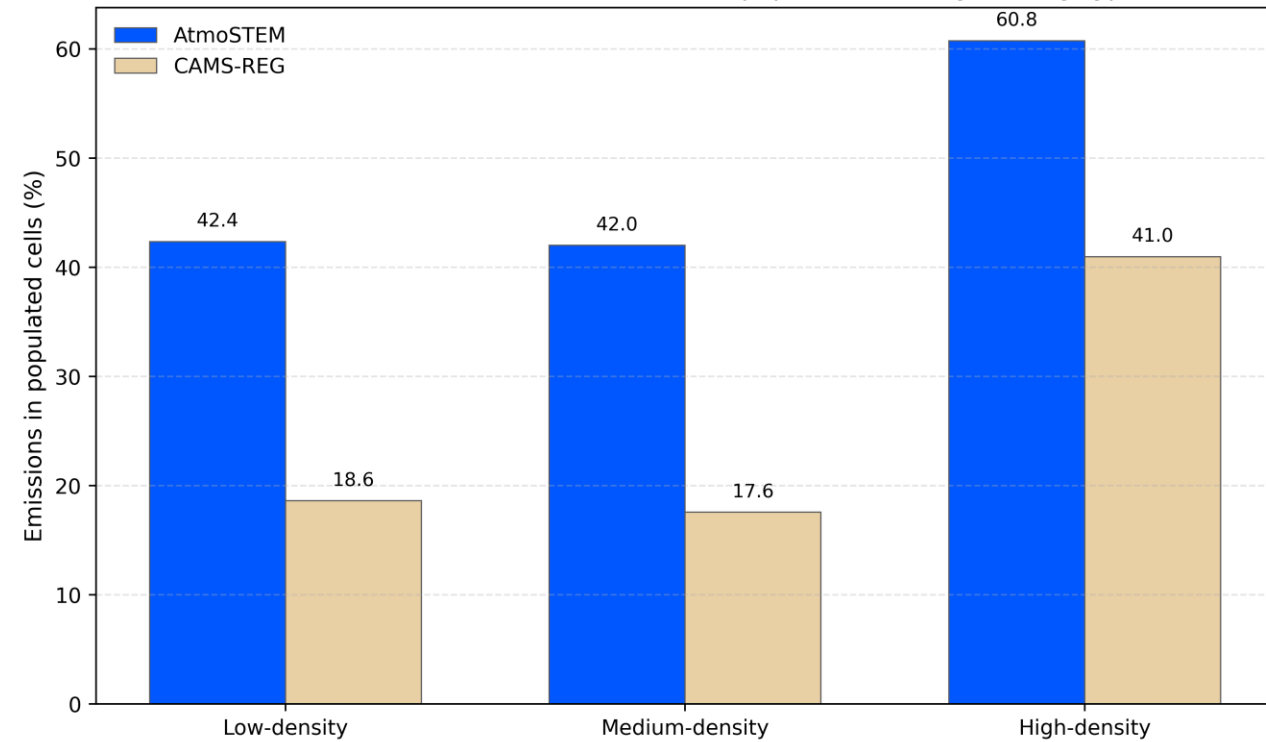


Positive values indicate enhanced localization of emissions in AtmoSTEM, while negative values reflect redistribution from diffuse regions.

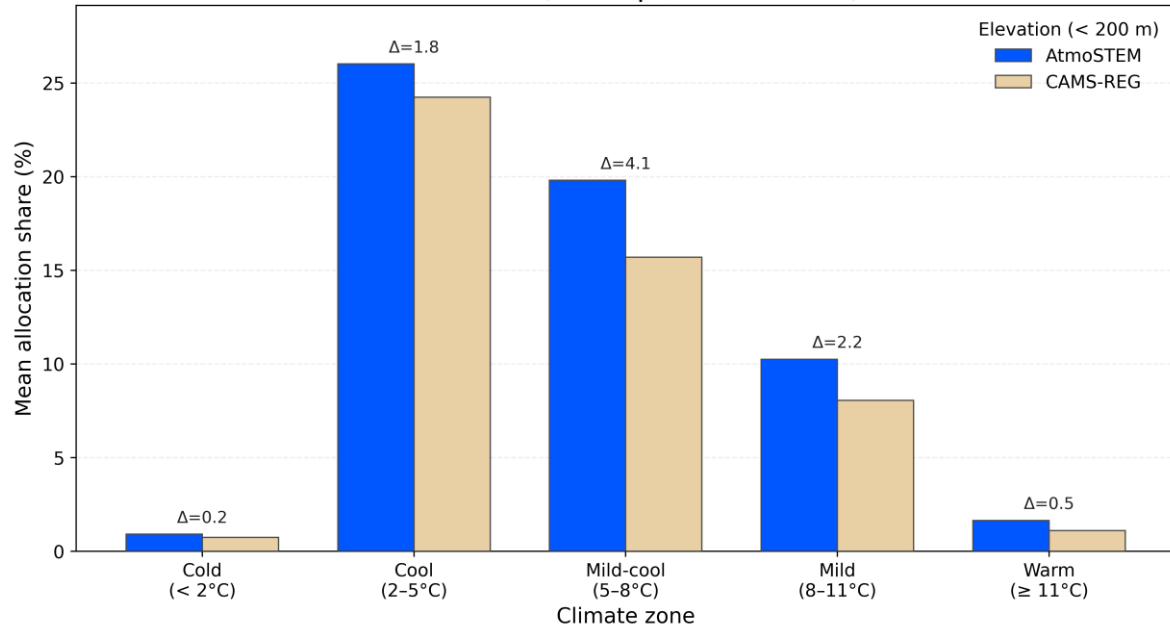
Residential PM_{2.5} emissions allocated to non-populated cells by country type



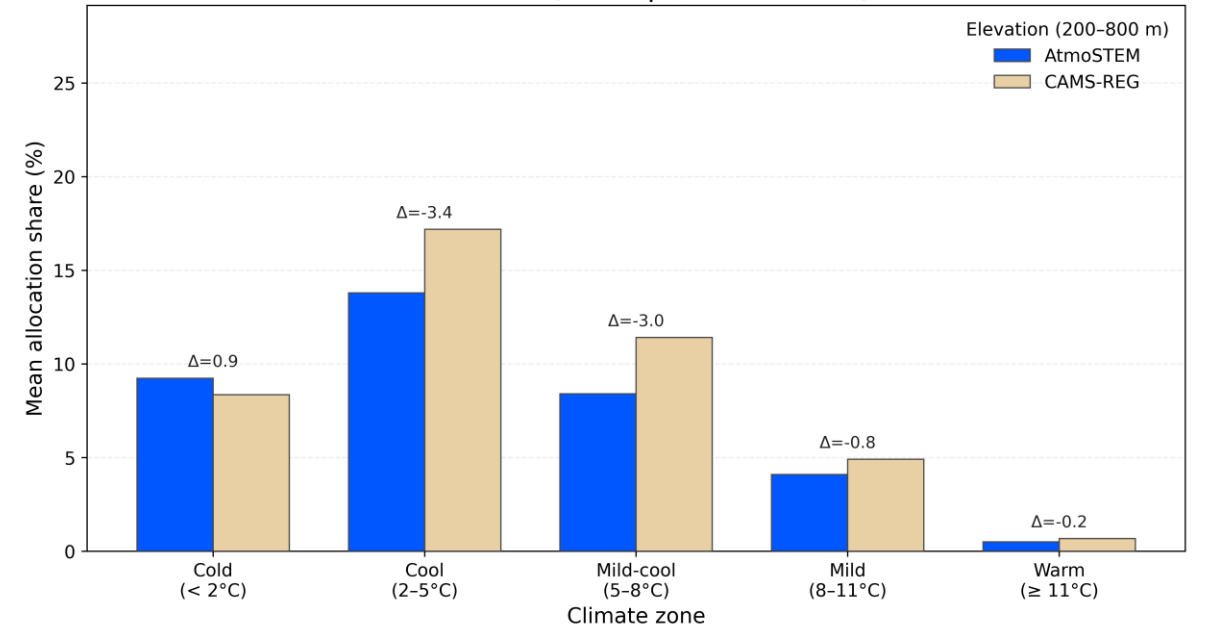
Residential PM_{2.5} emissions allocated to populated cells by country type



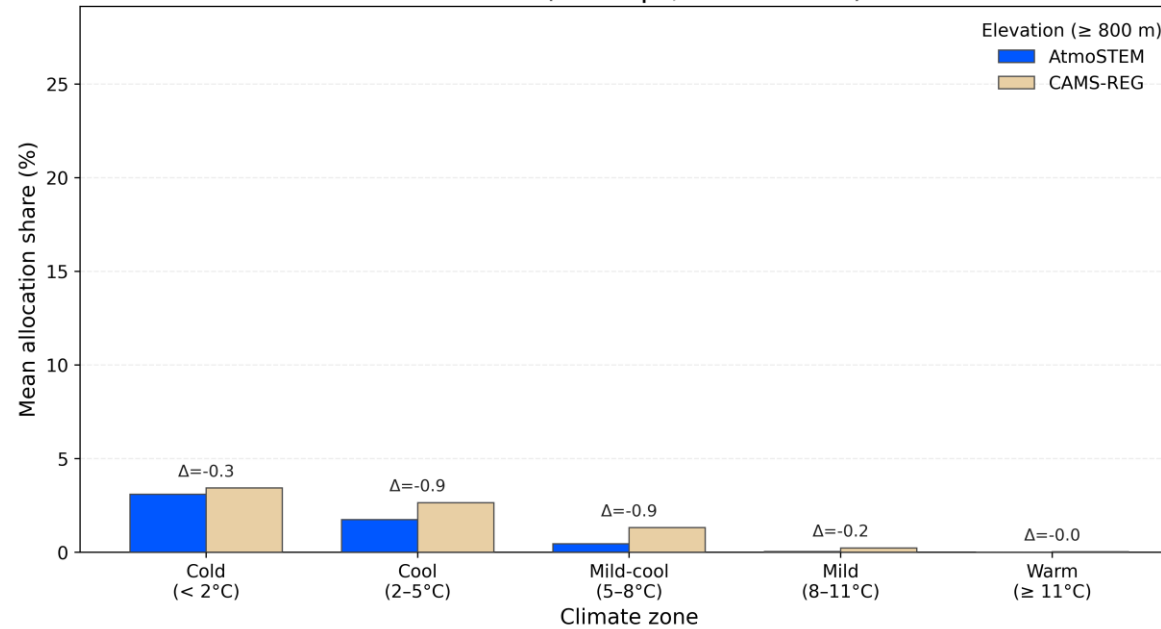
Mean PM_{2.5} emission allocation share from residential heating (GNFR C) in Greece (Oct-Apr, 2015-2024)



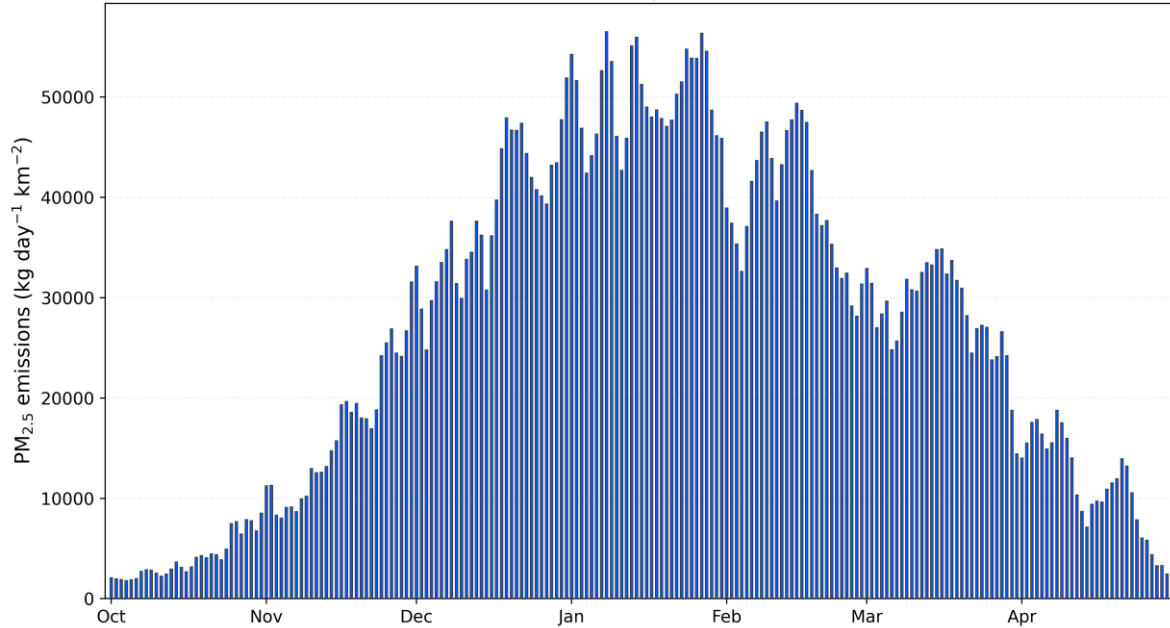
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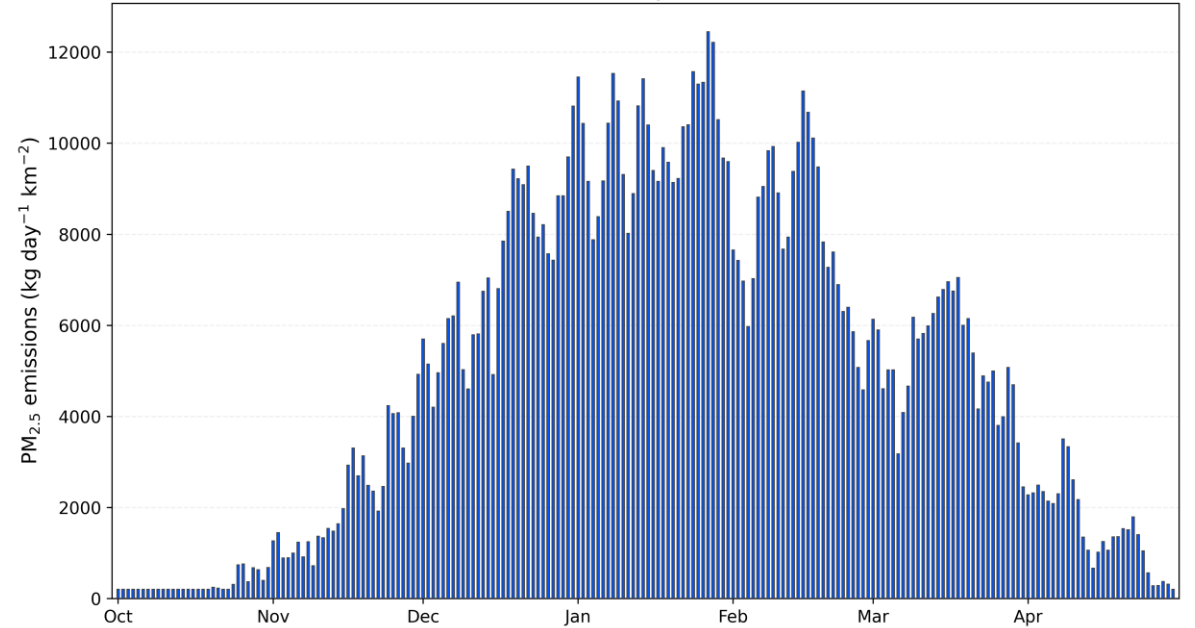
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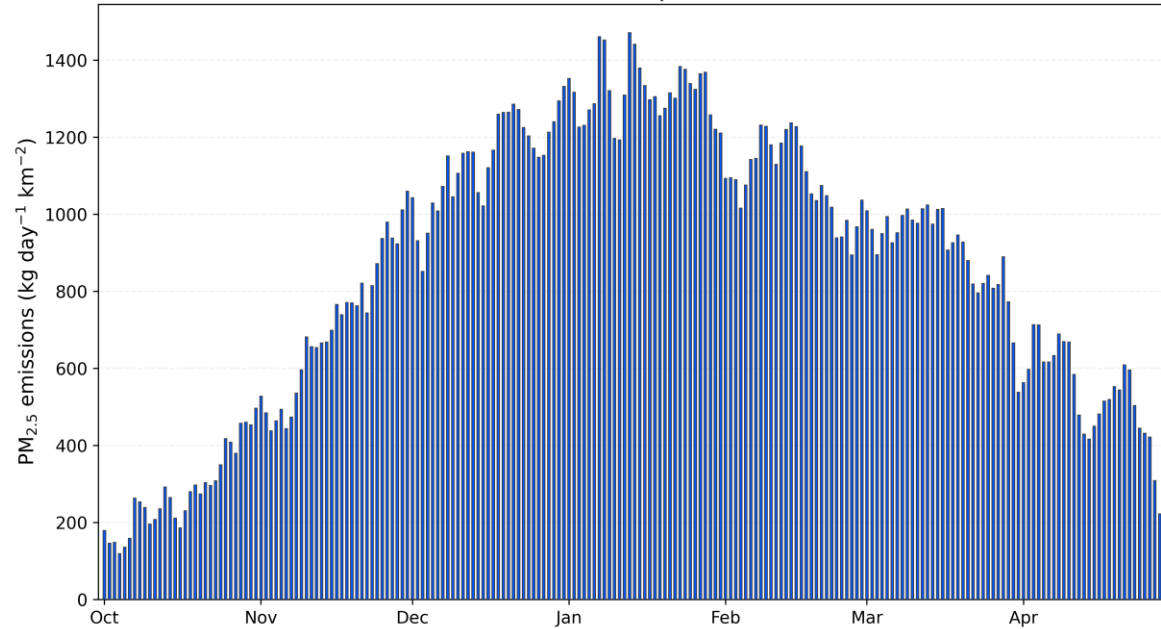
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Greece (Oct-Apr, 2015-2024)



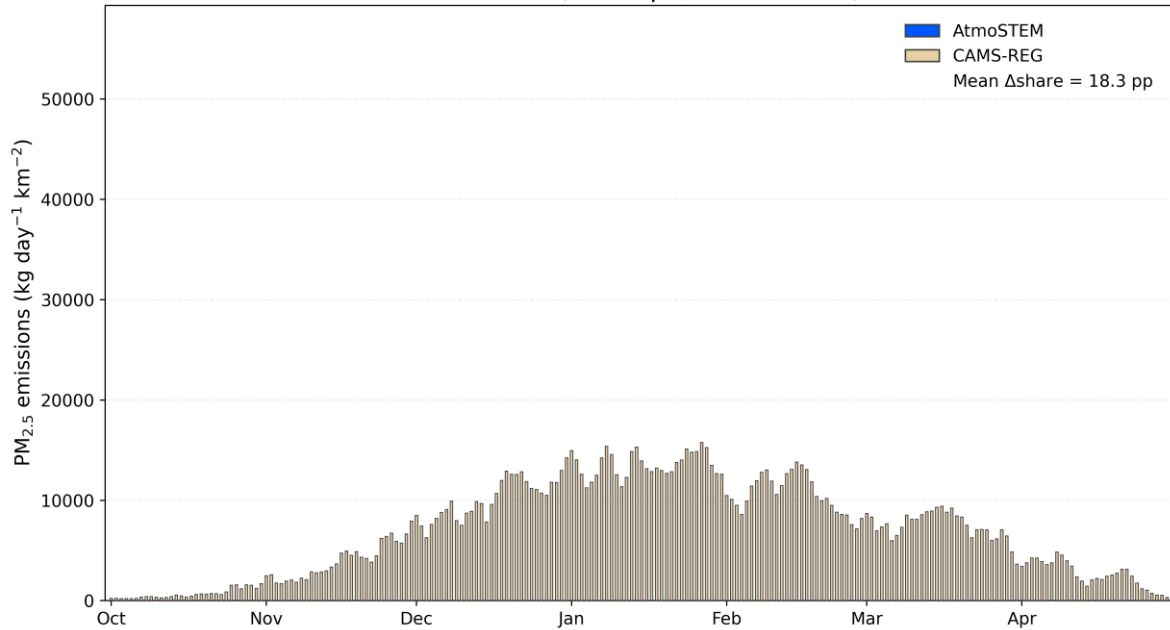
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Athens (Oct-Apr, 2015-2024)



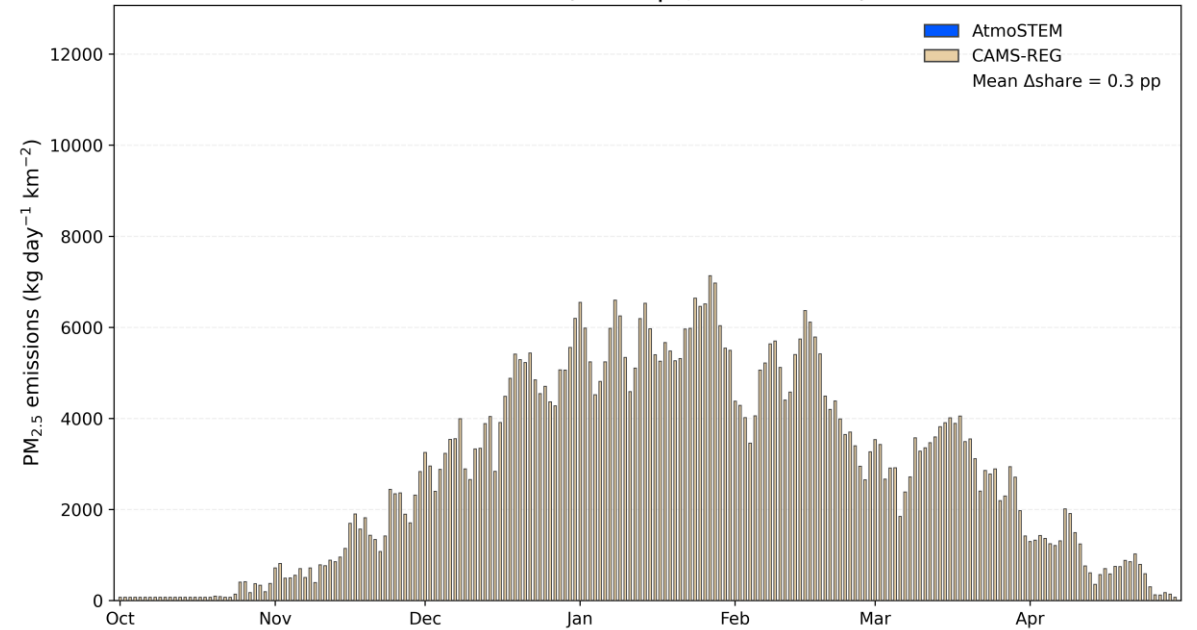
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Ioannina (Oct-Apr, 2015-2024)



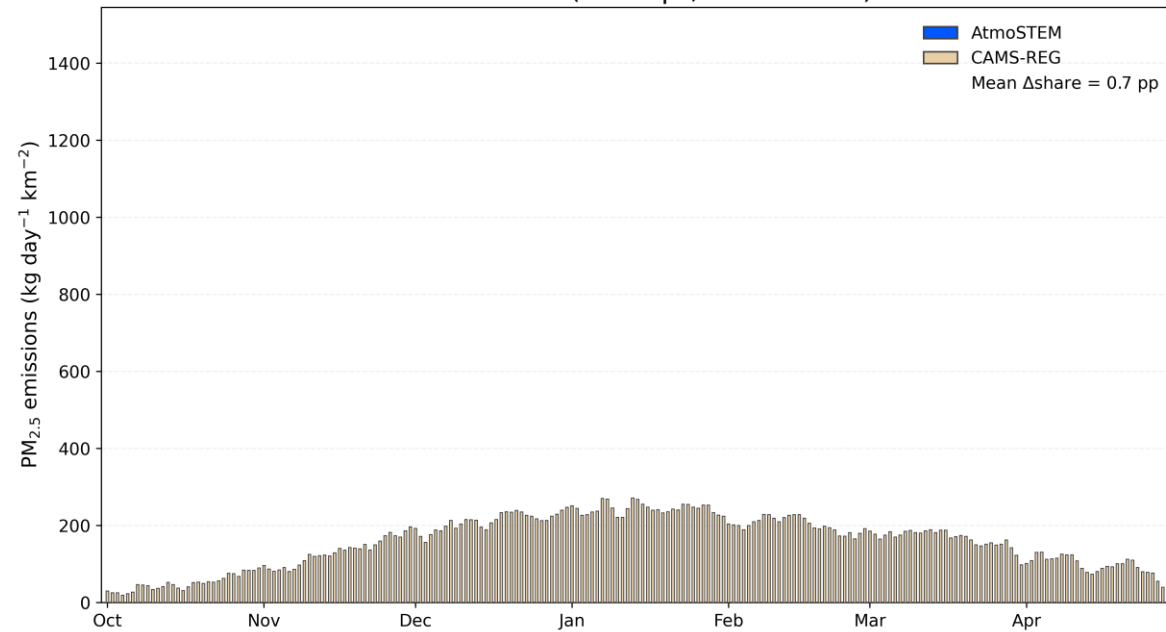
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Greece (Oct-Apr, 2015-2024)



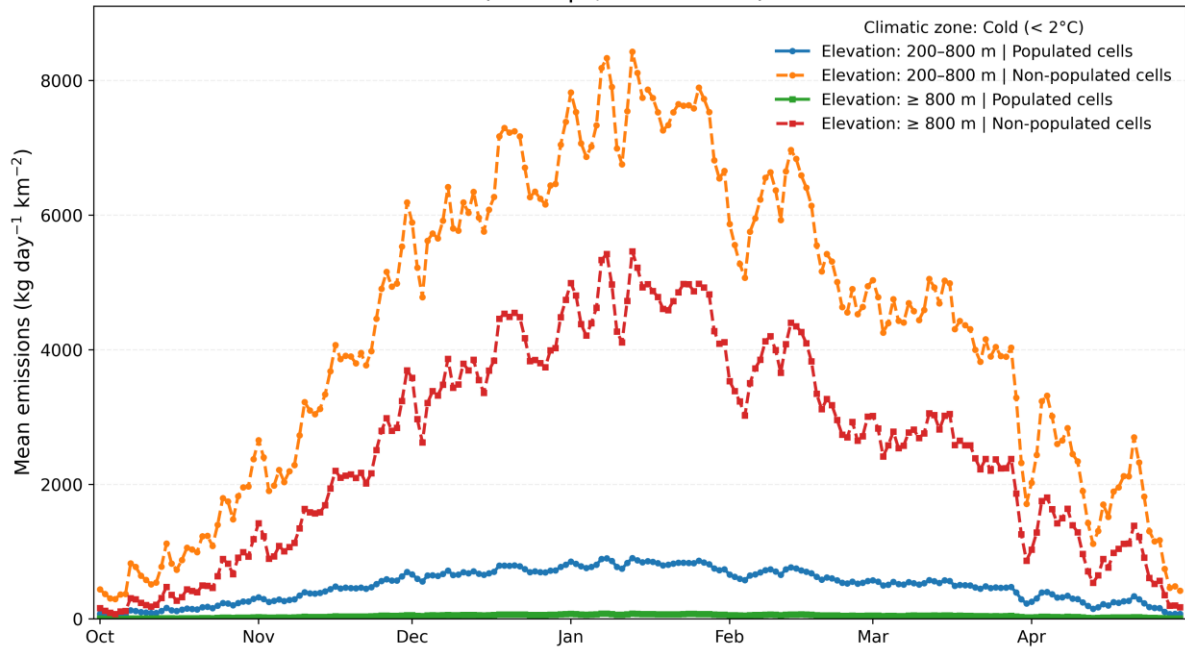
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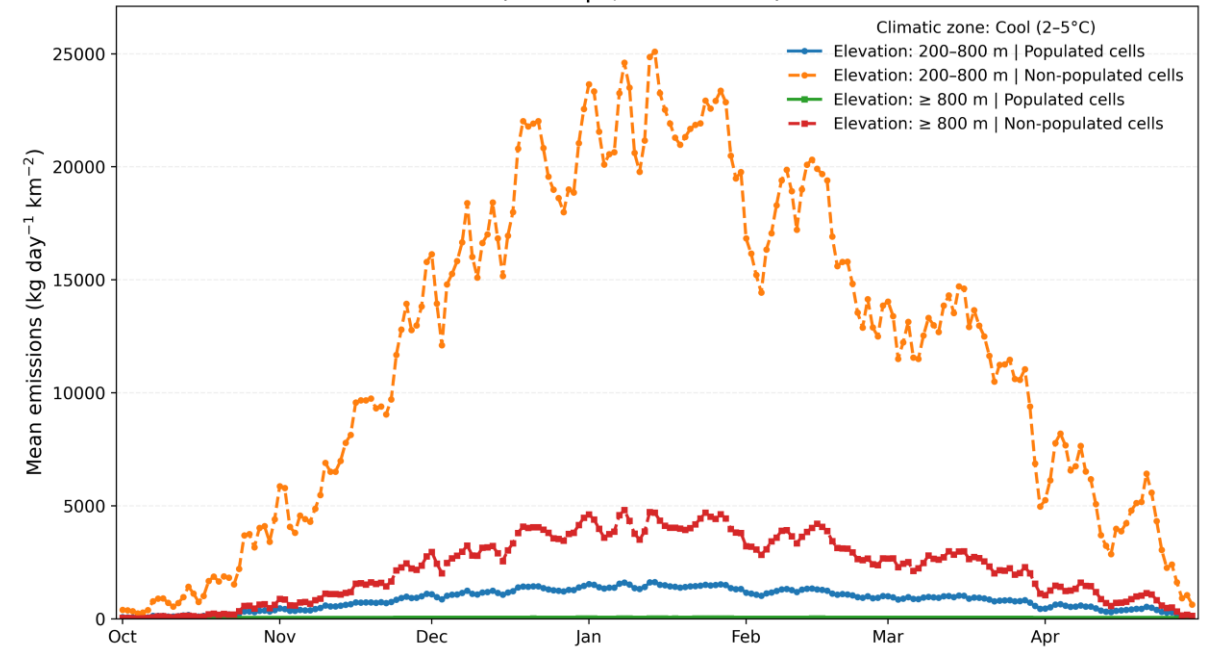
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Ioannina (Oct-Apr, 2015-2024)



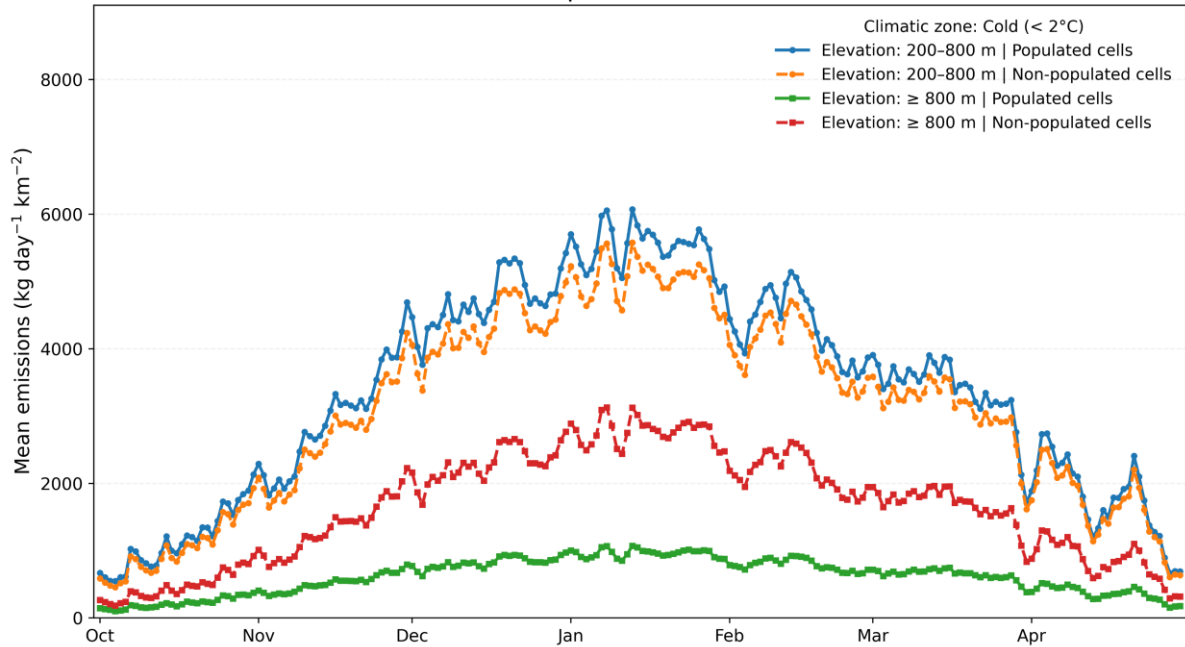
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Greece (Oct-Apr, 2015-2024) - CAMS-REG



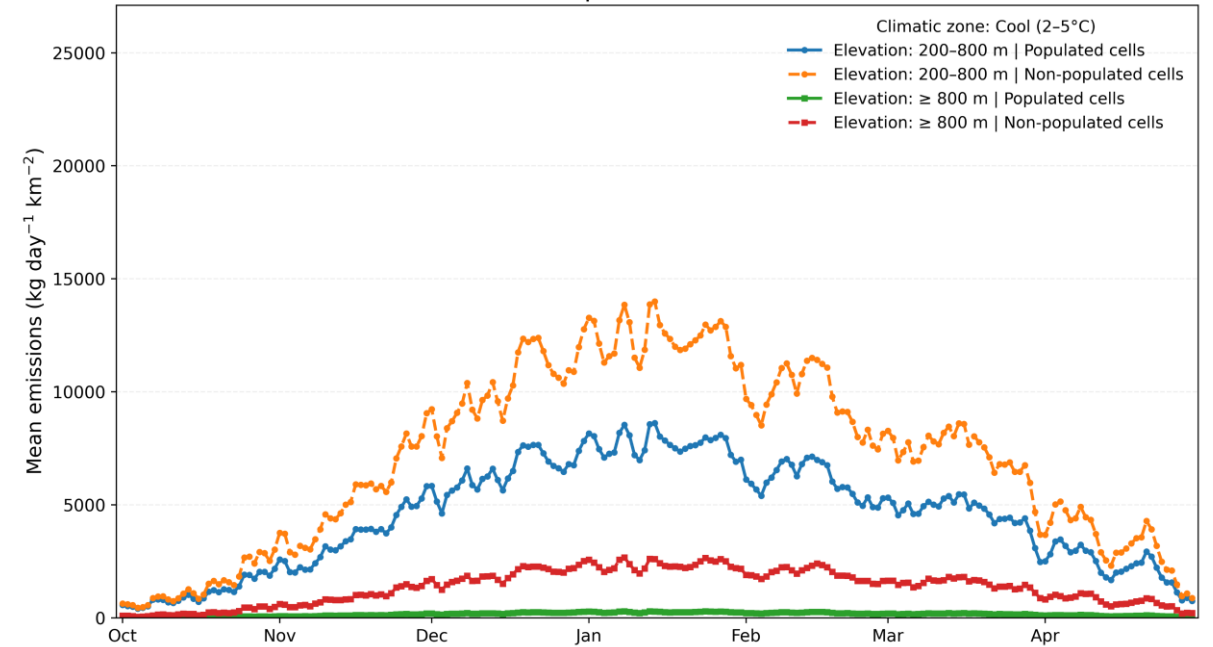
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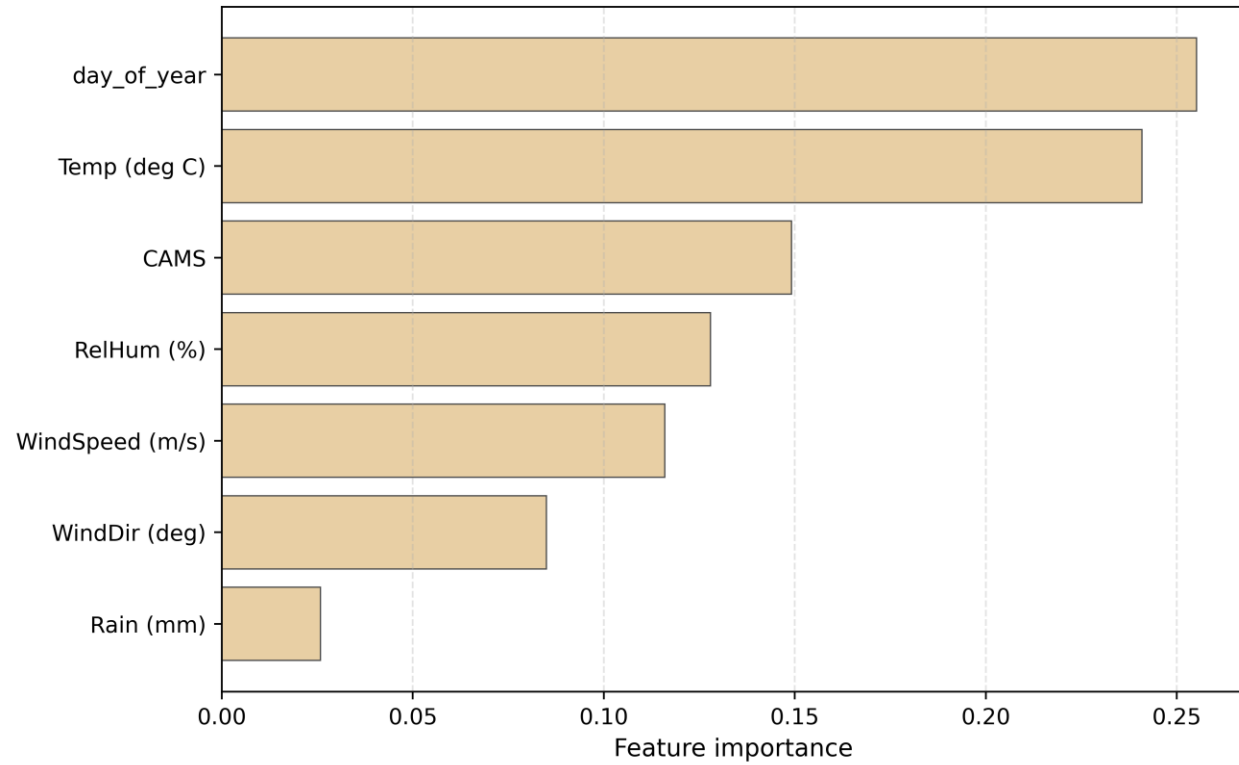
Climatological mean daily PM_{2.5} emissions from residential heating (GNFR C) in Greece (Oct-Apr, 2015-2024) - AtmoSTEM



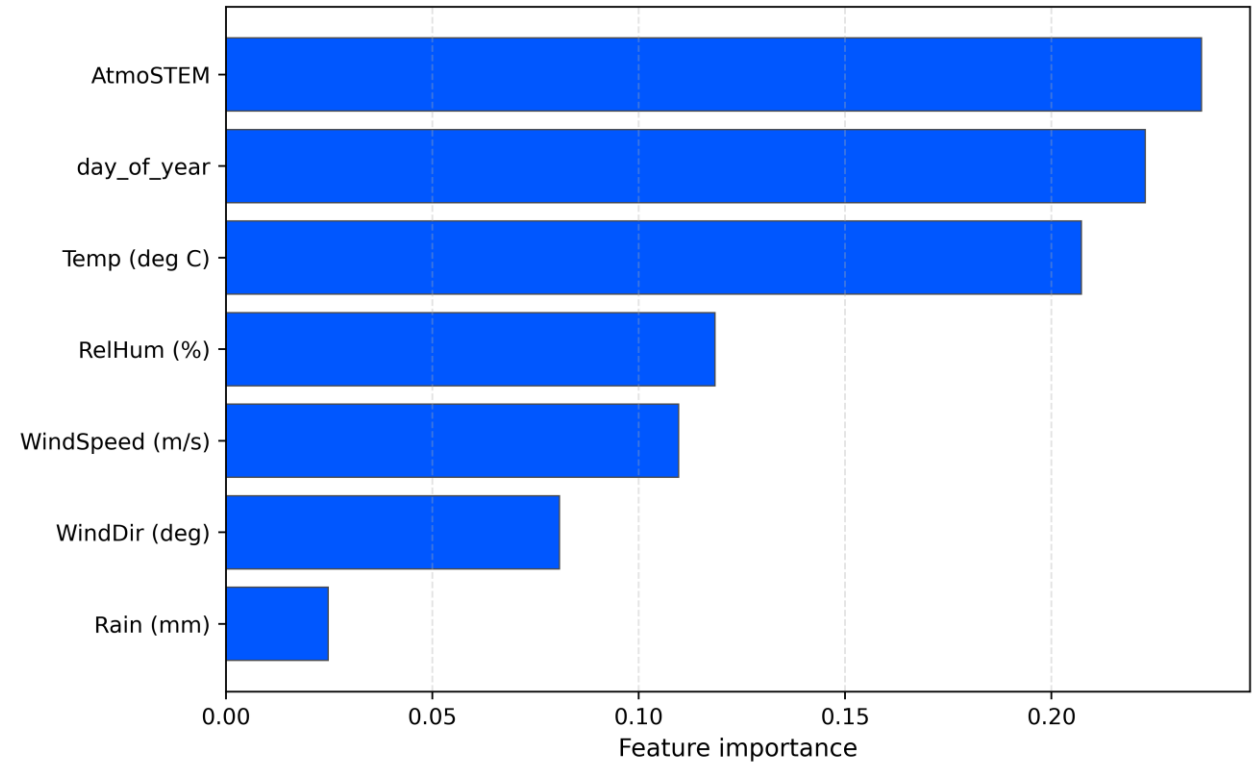
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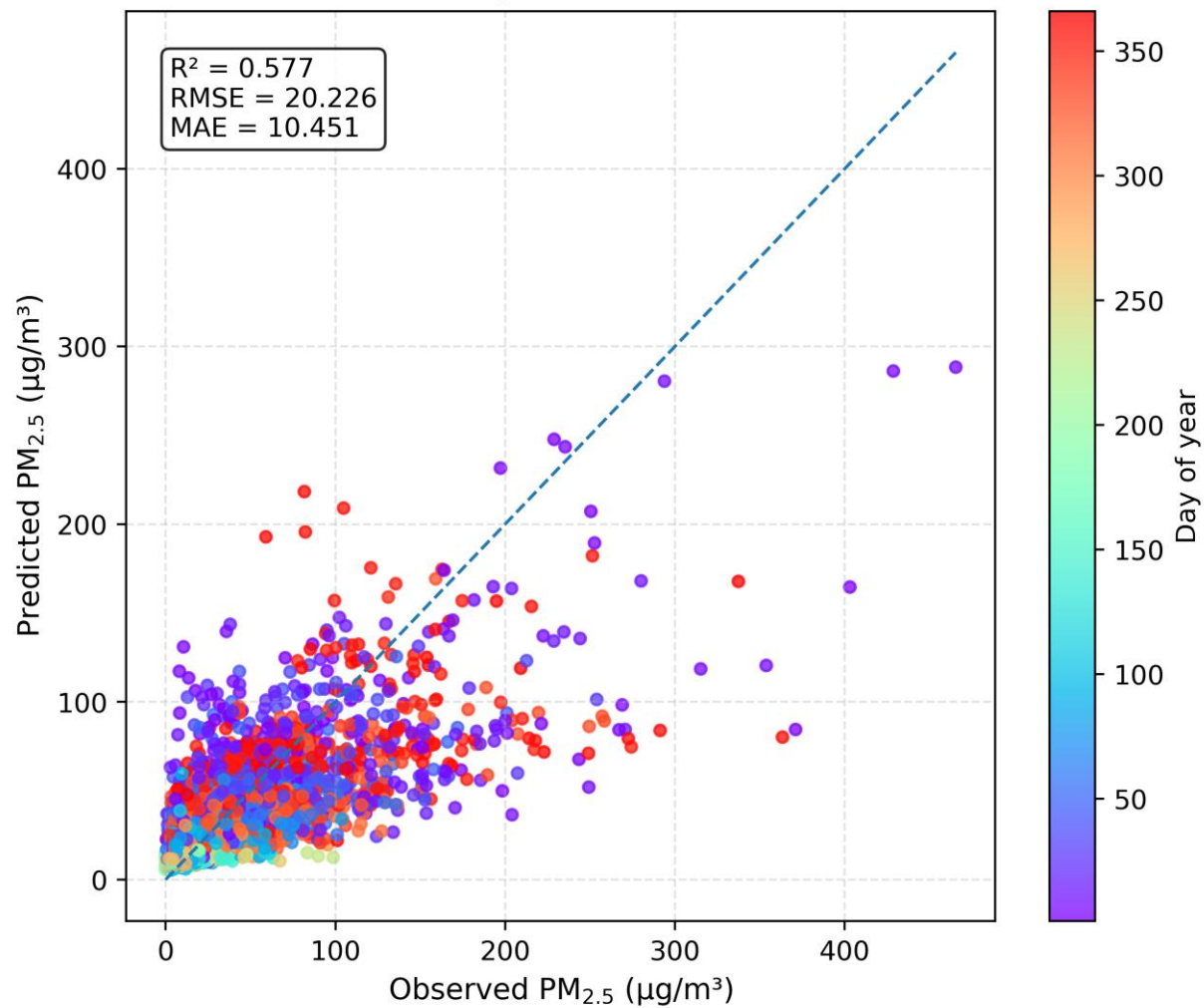
Feature importance of predicted PM_{2.5} concentrations using RF model
CAM5, 2019-2024



Feature importance of predicted PM_{2.5} concentrations using RF model
AtmoSTEM, 2019-2024



Validation of predicted PM_{2.5} concentrations in Ioannina
CAMS, 2019 - 2024



Validation of predicted PM_{2.5} concentrations in Ioannina
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