

RI-Urbans

Services tools on the Development of Monitoring and Modelling methodologies for Novel AQ variables in the AAQD 2024/2881

Augustin COLETTE (INERIS)

FAIRMODE Plenary Meeting, 5 March, 2025

14 countries, 26 beneficiaries, 1 associated beneficiary, starting with 11 cities, 17 associated collaborators

INSTITUTE OF CHEMICAL PHYSICS
FUNDAMENTALS OF THE ASCR

European
Commission



RI-URBANS (101036245)



RI-URBANS' service tools

<https://riurbans.eu/project/#service-tools>

The screenshot shows the RI-URBANS project website. At the top, there is a navigation bar with links for PROJECT, RESULTS, and NEWS & EVENT. The PROJECT link is highlighted with a red circle. Below the navigation bar, there is a main menu with links for SERVICE TOOLS, PILOTS, WORKPACKAGES, DELIVERABLES & MILESTONES, INNOVATION, STAKEHOLDERS, and MANAGEMENT STRUCTURE. The SERVICE TOOLS link is also highlighted with a red circle. The background of the page features a photograph of a city skyline with mountains in the background. A green overlay box contains the text: "Turning clean urban air into reality" and "At RI-URBANS we reshape the way air quality is measured". Below this, another green box contains the text: "Explore all our advanced Service Tools for optimised urban air quality management:" followed by a list of nine items, each preceded by a blue plus sign.

- + Protocols for the measurement of novel air quality variables
- + Methodologies for vertical profiles of pollutants and meteorology
- + Methodologies for source apportionment receptor modelling
- + Methodologies for urban mapping of novel air quality variables
- + Methodologies for evaluating the health effects of novel air quality variables
- + Obtaining emission inventories for novel air quality variables
- + Modelling methodologies for novel air quality variables



RI-URBANS' service tools

<https://riurbans.eu/project/#service-tools>

– Protocols for the measurement of novel air quality variables

ST1: Ultrafine (=nano)-Particle Number Size Distributions (UFP-PNSD)

ST2: Black Carbon (BC)

ST3: Offline and Online particulate matter (PM) speciation

ST4: Oxidative potential of particulate matter (PM)

ST5: Volatile Organic Compounds (VOCs)

ST6: Ammonia (NH₃)

– Methodologies for vertical profiles of pollutants and meteorology

ST7: Measurements of boundary level height

ST8: Measurements of vertical profiles of aerosols

ST9: Measurements of vertical profiles by commercial aircrafts

– Methodologies for source apportionment receptor modelling

ST10: Source apportionment of PM based on offline and online PM speciation

ST11: Source apportionment of UFP, BC, OP and VOCs using receptor modelling

– Methodologies for urban mapping of novel air quality variables

ST12: Deterministic urban modelling of fine PM and PNC

– Methodologies for evaluating the health effects of novel air quality variables

ST14: Evaluation of health effects of novel air quality parameters

– Obtaining emission inventories for novel air quality variables

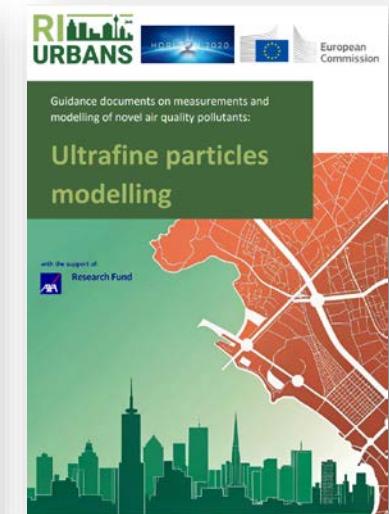
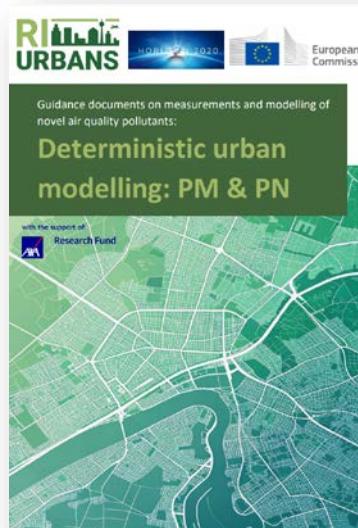
ST15: Emission inventories for regional and urban scale modelling applications

– Modelling methodologies for novel air quality variables

ST16: UFP-PNSD multiscale modelling

RI-Urbans Service Tools on Modelling

- **3 Service Tools already published on riurbans.eu:**
 - [**ST12: Deterministic urban modelling of fine PM and PNC**](#)
 - [**ST15: First UFP-PNSD and non-exhaust vehicle PM EU emission**](#)
 - [**ST16: UFP-PNSD multiscale modelling**](#)
- **Service Tool in preparation (Sept 2025):**
 - **Source apportionment PM mass and number**
 - **Oxidative Potential modelling**
 - **Evaluating of model vertical profiles in cities**



QA/QC of Black Carbon

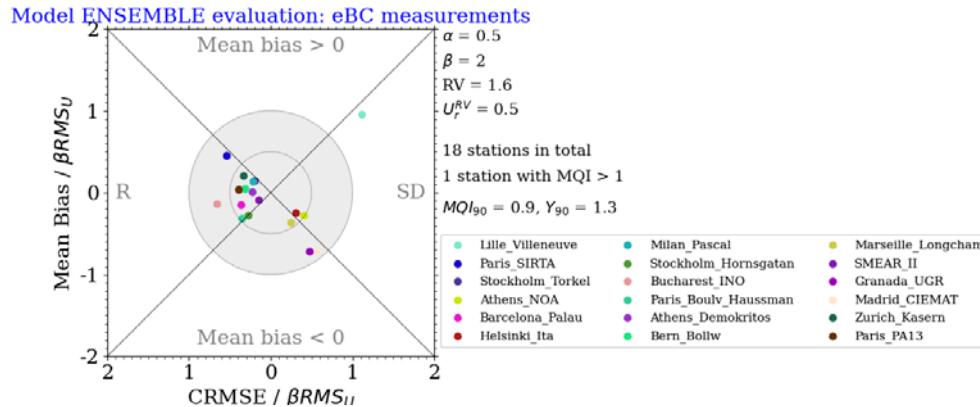
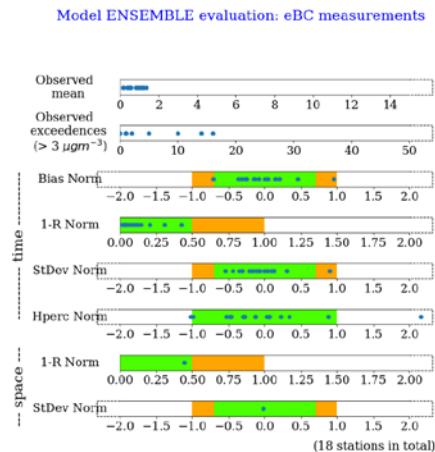
https://riurbans.eu/wp-content/uploads/2024/04/RI-URBANS_D19_D3_4.pdf

• Input data:

- Observations: AE33: Hourly automated monitoring of BC: EBAS/ACTRIS
- Models: CAMS: Operational Forecast & Analysis of EC: Atmos Data Store (ADS)

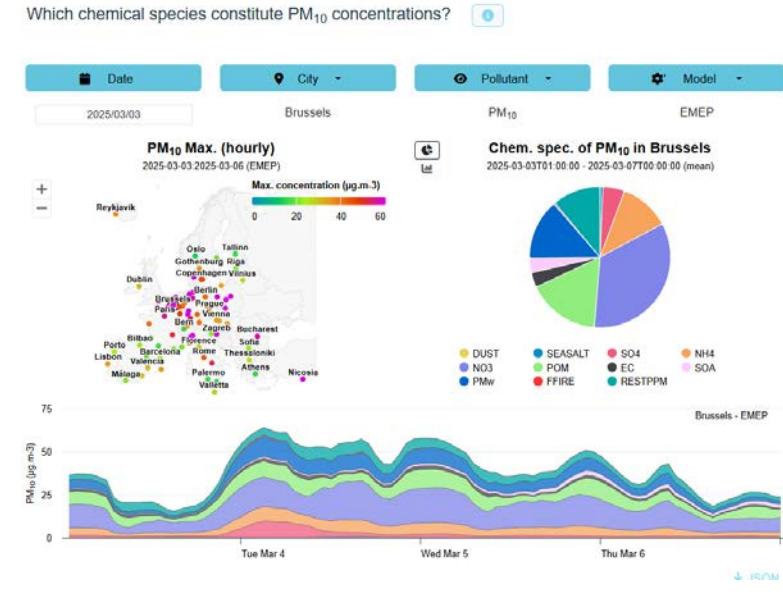
• QA/QC Development in RI-Urbans

- Conversion from BC to eBC ([RI-Urbans ST 2](#)) + Associated Uncertainty
- FAIRMODE Target Plot & NRT EQC Demonstrator
- Multi-Model Intercomparison (2018)



Forthcoming in CAMS2_71_bis (2025-2028):

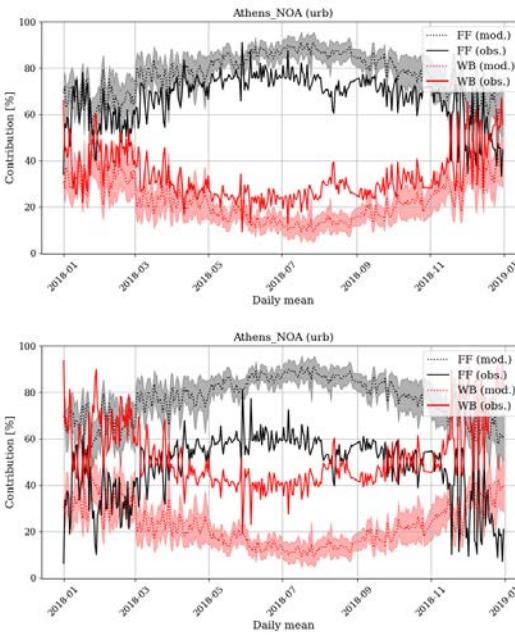
=> Integration in CAMS Policy Service Website



QA/QC of PM Source App.

- **Equiv. Black Carbon**

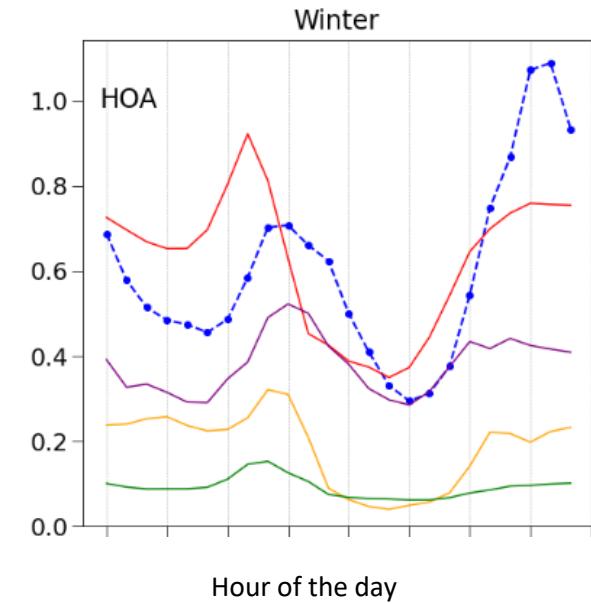
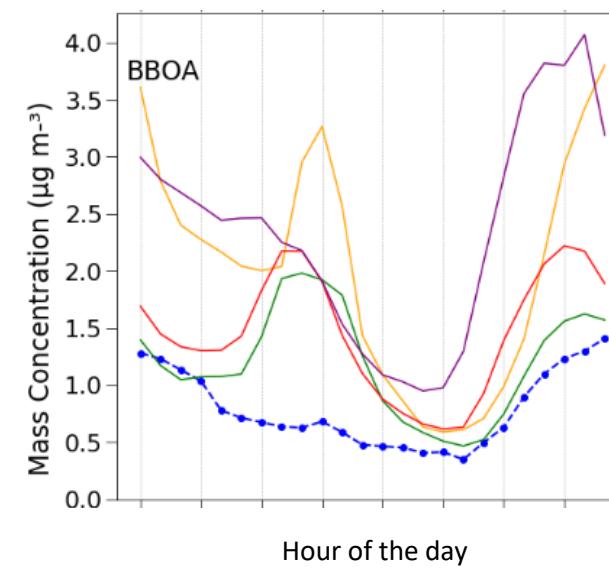
- **AE33 : Solid/liquid fuel (not Oper)**
- **CAMS : EC residential / EC total (Oper)**



AAE values of
Sandradewi et al.
(2008) (top panel) and
Zotter et al. (2017)
(bottom panel)

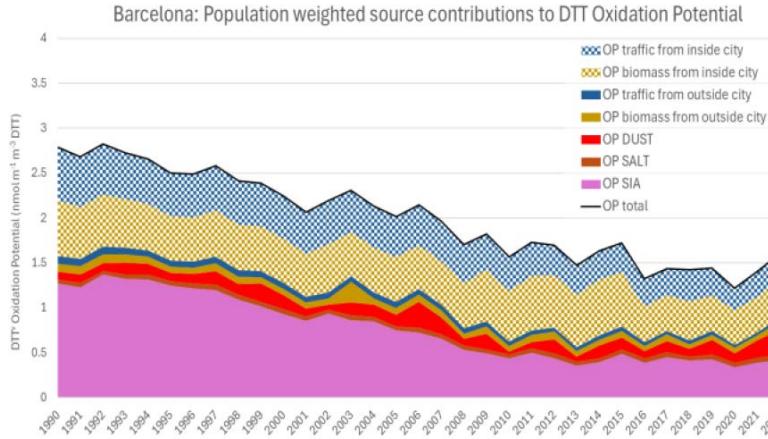
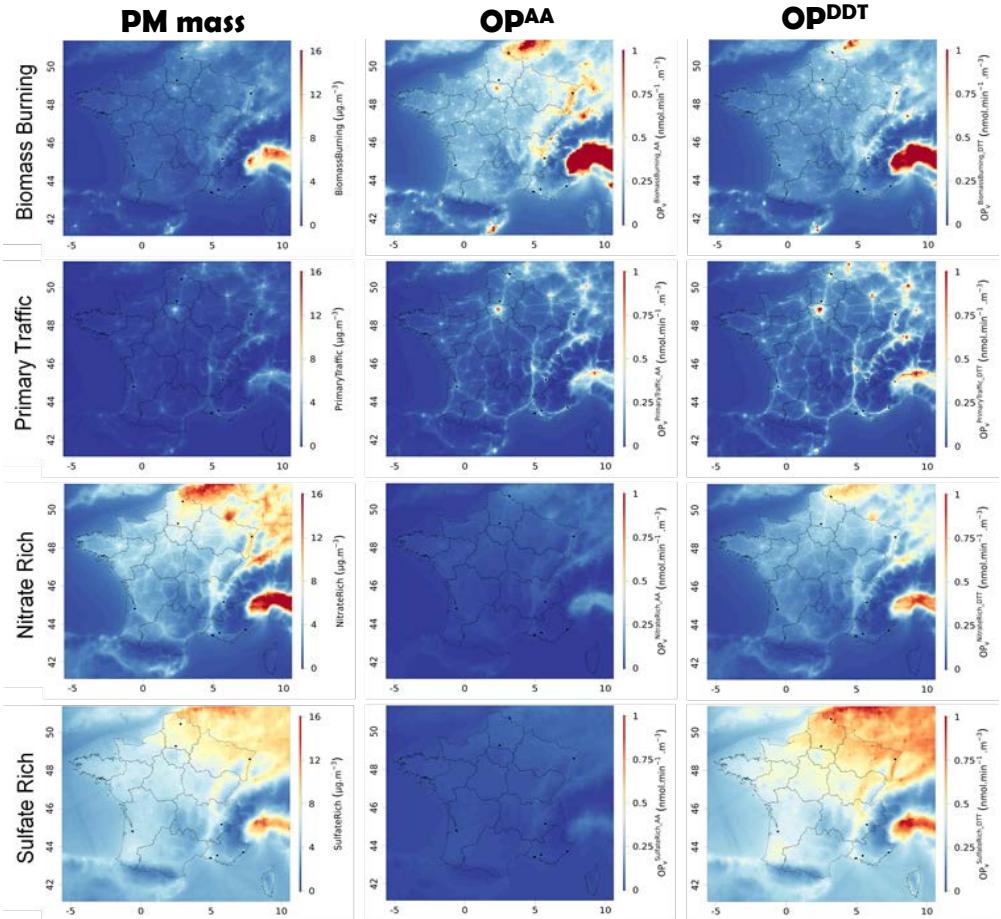
- **Organic aerosols**

- **ACSM OOA/HOA/BBOA (not Oper)**
- **CTMs (N/A in CAMS)**

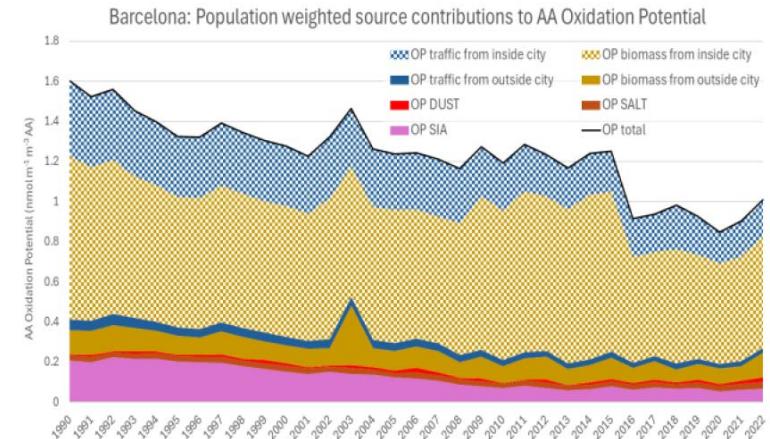


Oxidative Potential Modelling

- Modelled PM Source App (tagging)
- Observed Source-Specific OP^{DDT} and OP^{AA}



EMEP (METNO)



RI-URBANS (101036245)

Acessss to RI-URBANS Progress, open data, STs

<https://riurbans.eu/#progress>

<https://riurbans.eu/results/#open-data>

<https://riurbans.eu/project/#service-tools>

<https://riurbans.eu/results/#publications>