

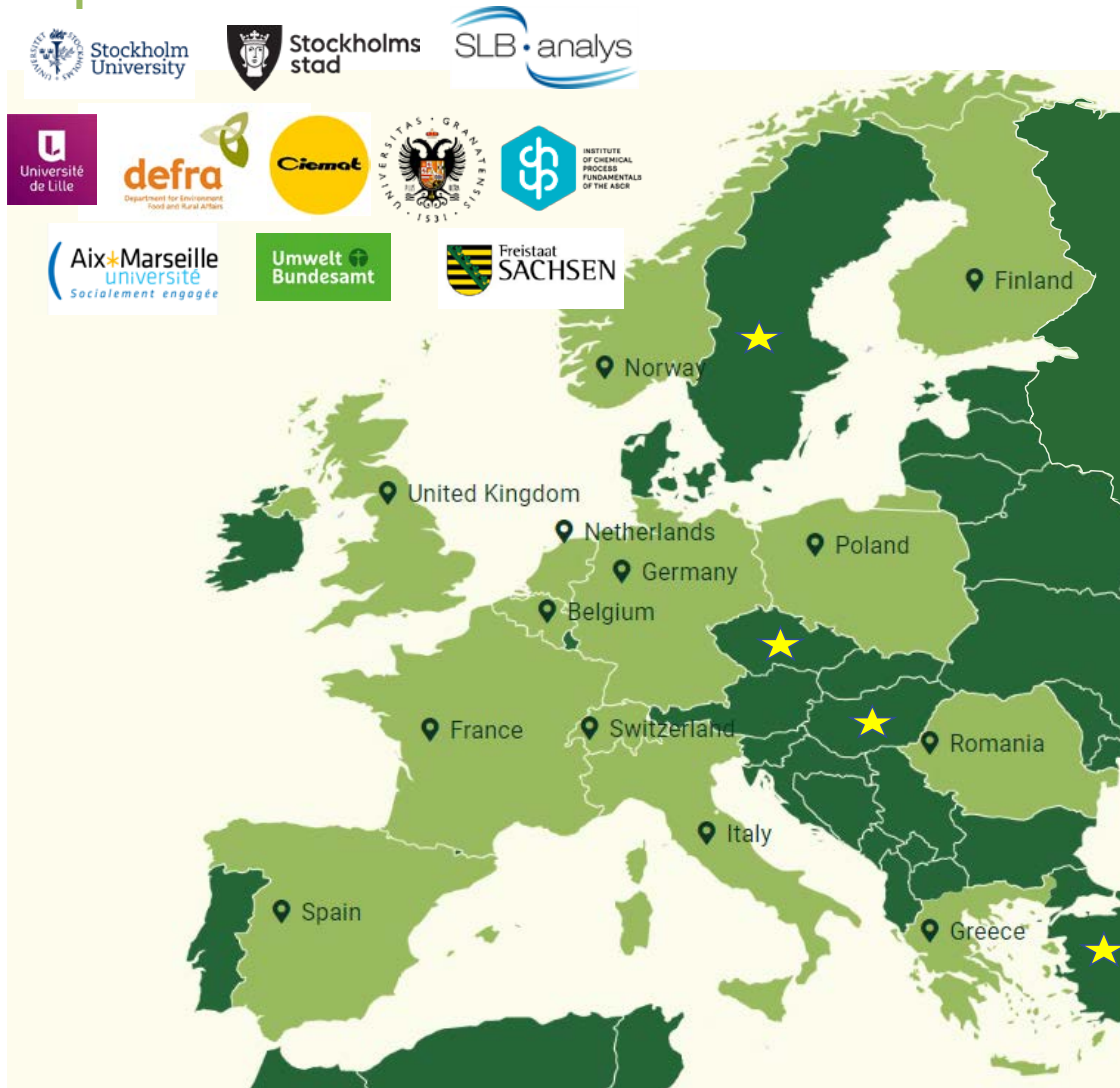
RI-Urbans

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

Augustin COLETTE (INERIS)

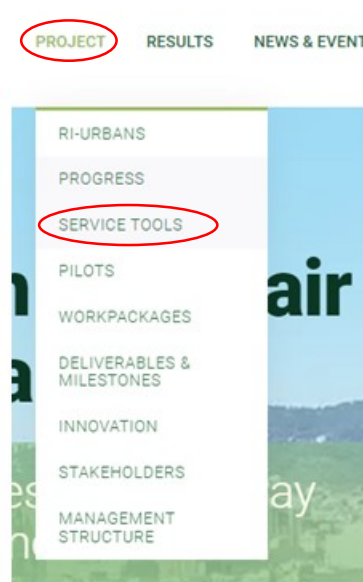
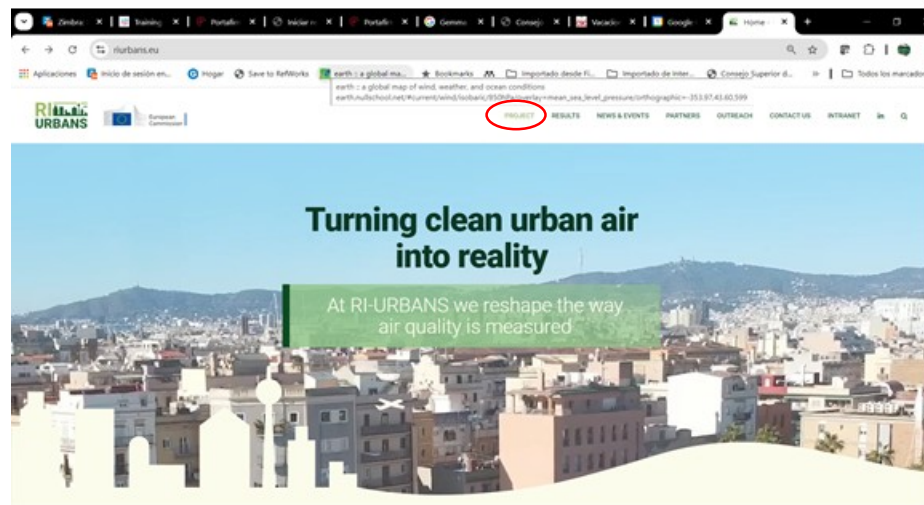
FAIRMODE Plenary Meeting, 5 March, 2025

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



RI-URBANS' service tools

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



Explore all our advanced Service Tools for optimised urban air quality management:

- + **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

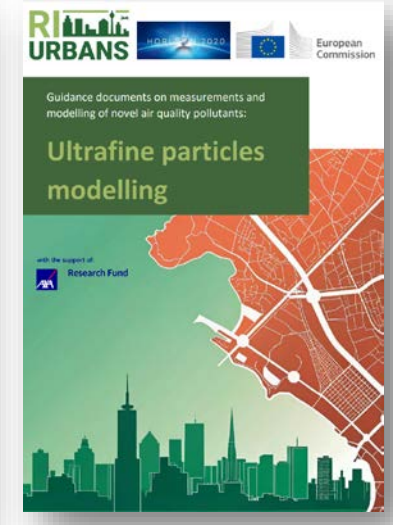
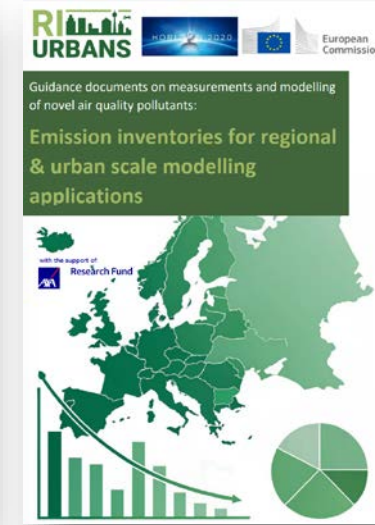
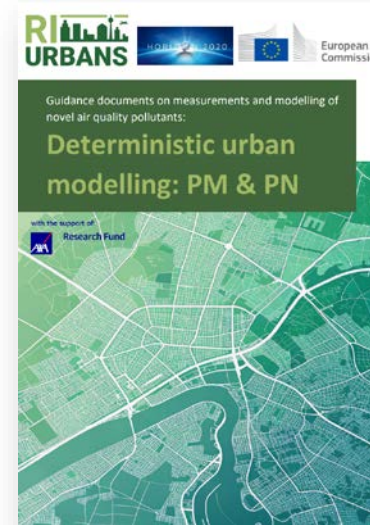
ST15: Emission inventories for regional and urban scale modelling applications

– 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

Input data:

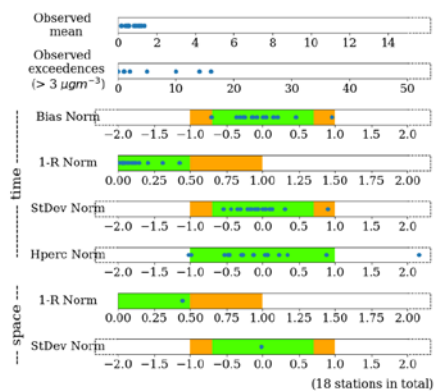
- Observations: AE33: Hourly automated monitoring of BC: EBAS/ACTRIS
- Models: CAMS: Operational Forecast & Analysis of EC: Atmos Data Store (ADS)

QA/QC Development in RI-Urbans

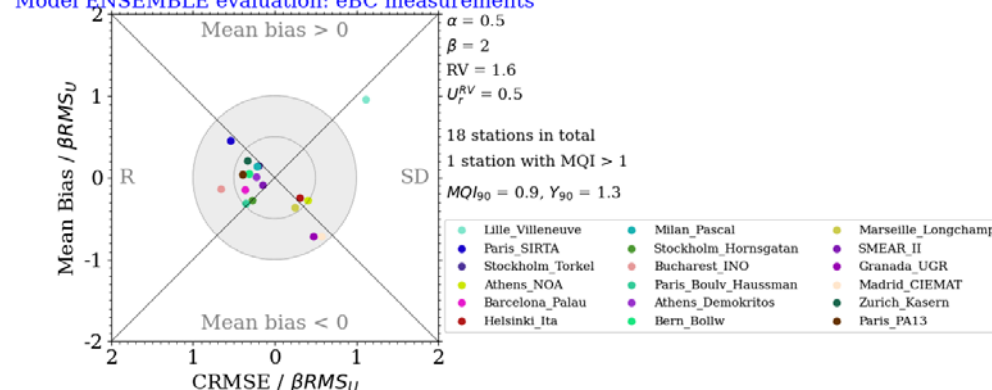
- Conversion from BC to eBC ([RI-Urbans ST 2](#)) + Associated Uncertainty
- FAIRMODE Target Plot & NRT EQC Demonstrator
- Multi-Model Intercomparison (2018)

Forthcoming in CAMS2_71_bis (2025-2028):
=> Integration in CAMS Policy Service Website

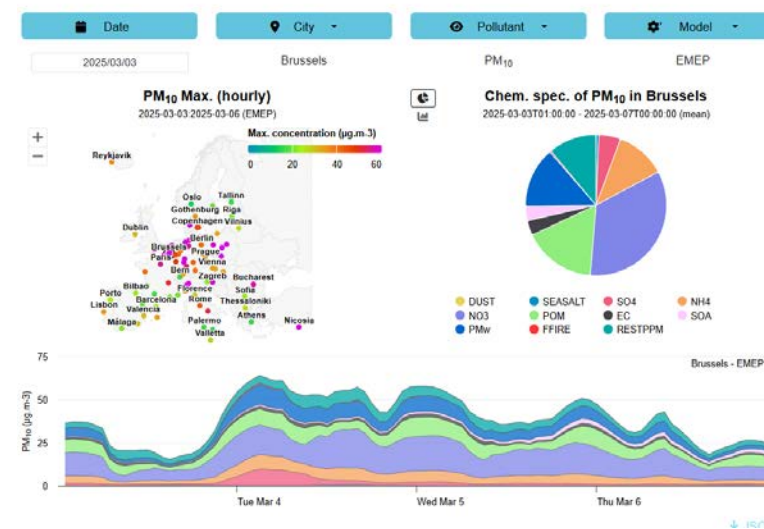
Model ENSEMBLE evaluation: eBC measurements



Model ENSEMBLE evaluation: eBC measurements

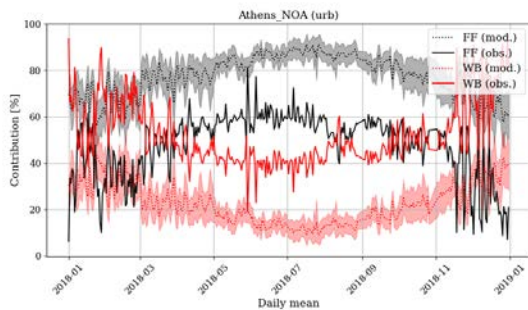
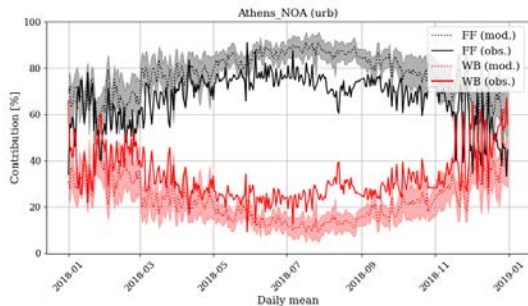


Which chemical species constitute PM₁₀ concentrations?



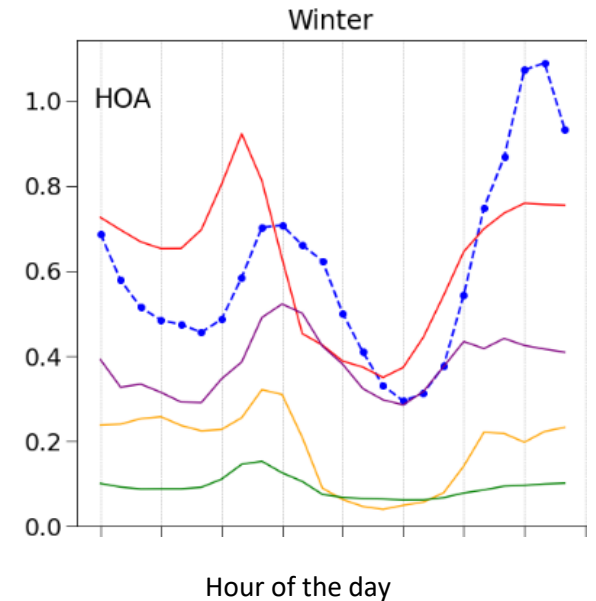
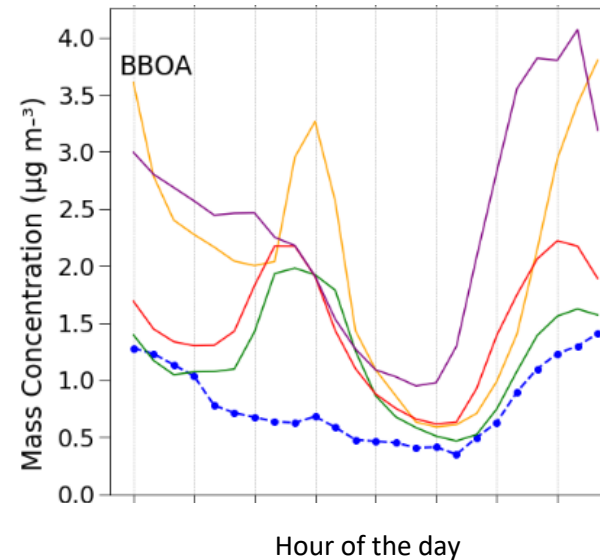
QA/QC of PM Source App.

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



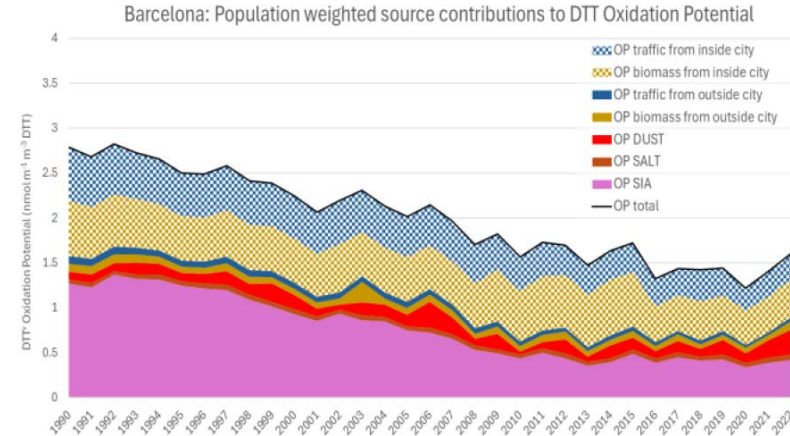
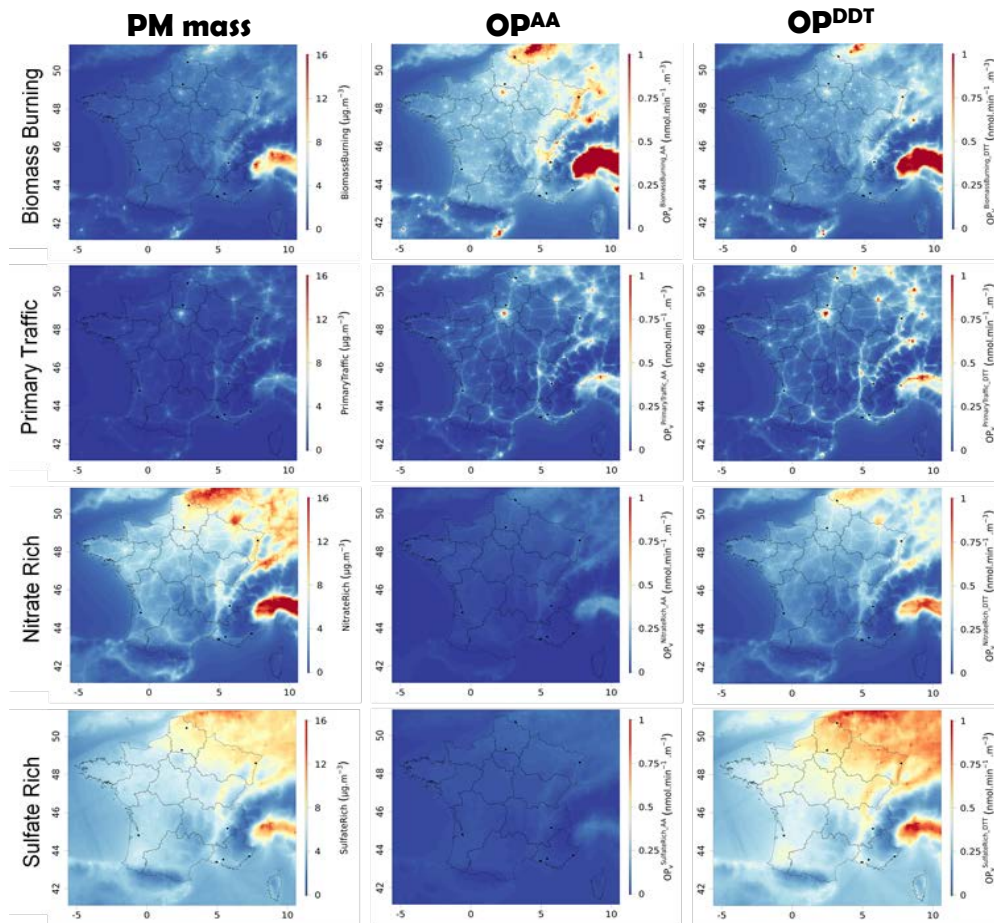
AAE values of Sandradewi et al. (2008) (top panel) and Zotter et al. (2017) (bottom panel)

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

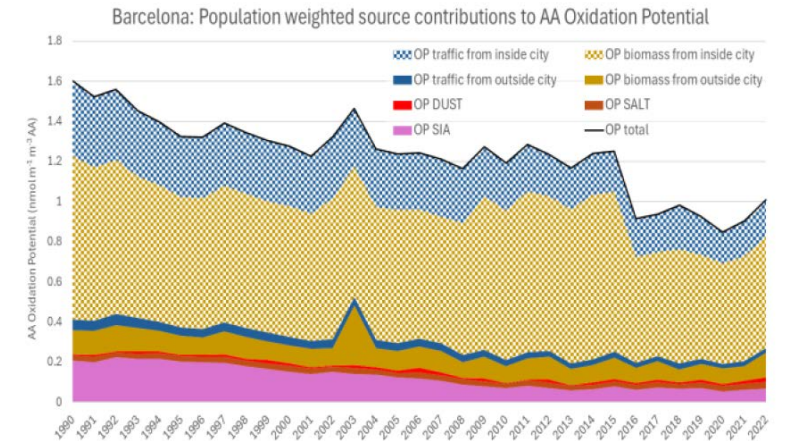


Oxidative Potential Modelling

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



EMEP (METNO)



CHIMERE
(CNRS/LISA)

Access 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>