

Valutazione del contributo di sorgenti emissive di PM_{10} nel Lazio durante il lockdown

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Dipartimento Biologia Ambientale



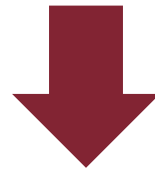
SAPIENZA
UNIVERSITÀ DI ROMA

ARPA Lazio
Webinar - 26 febbraio 2021

Valutazione del contributo di sorgenti emissive di PM_{10} nel Lazio durante il lockdown



Positive Matrix Factorization
(**PMF**)



Individuazione e quantificazione del contributo di diverse sorgenti emissive
alla concentrazione di massa totale del PM_{10}
a partire dalle concentrazioni di molteplici variabili (**analisi multivariata**)
misurate nel sito recettore (**modello a recettore**)

Analisi fattoriale multivariata che scompone una matrice di dati in altre due matrici

MATRICE DEI DATI:
numero di campioni (n)
numero di specie chimiche
misurate (m)

$$Q(E) = \sum_{i=1}^m \sum_{j=1}^n \left(\frac{e_{ij}}{\sigma_{ij}} \right)^2$$



Matrice dei profili di
sorgente

$$X = GF + E$$

Matrice dei residui



Contributo di sorgente
per ogni campione

EPA PMF 5.0

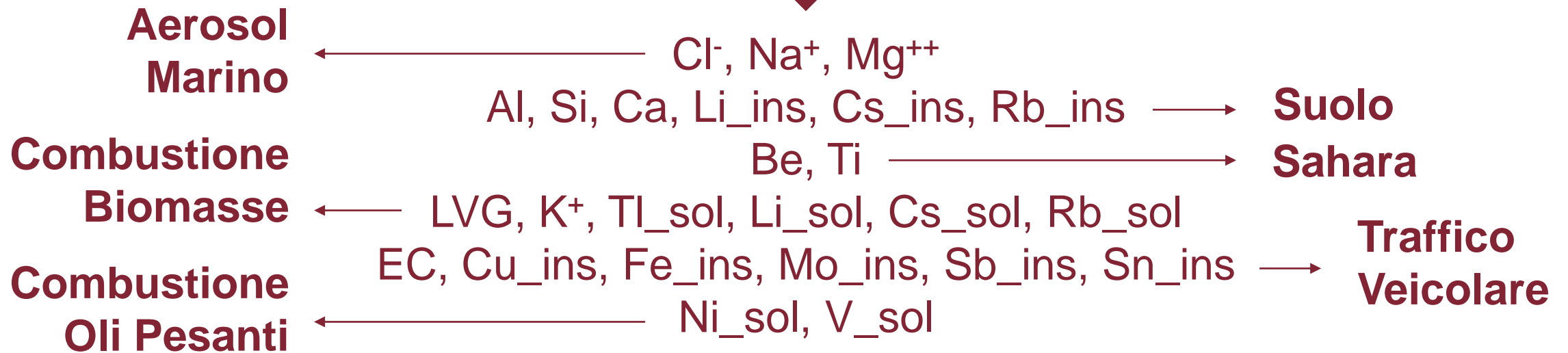


Selezione delle variabili (specie chimiche misurate)

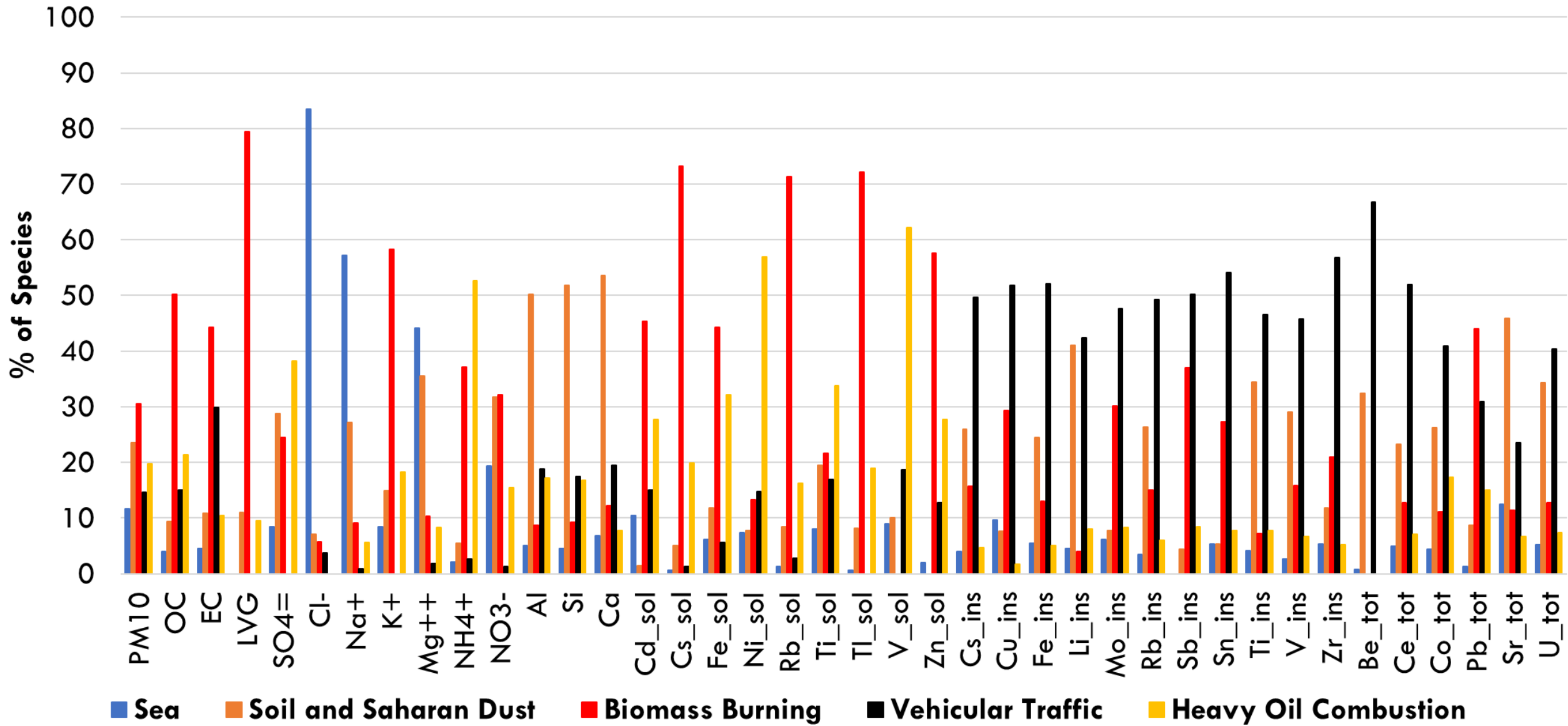
Selezione delle variabili

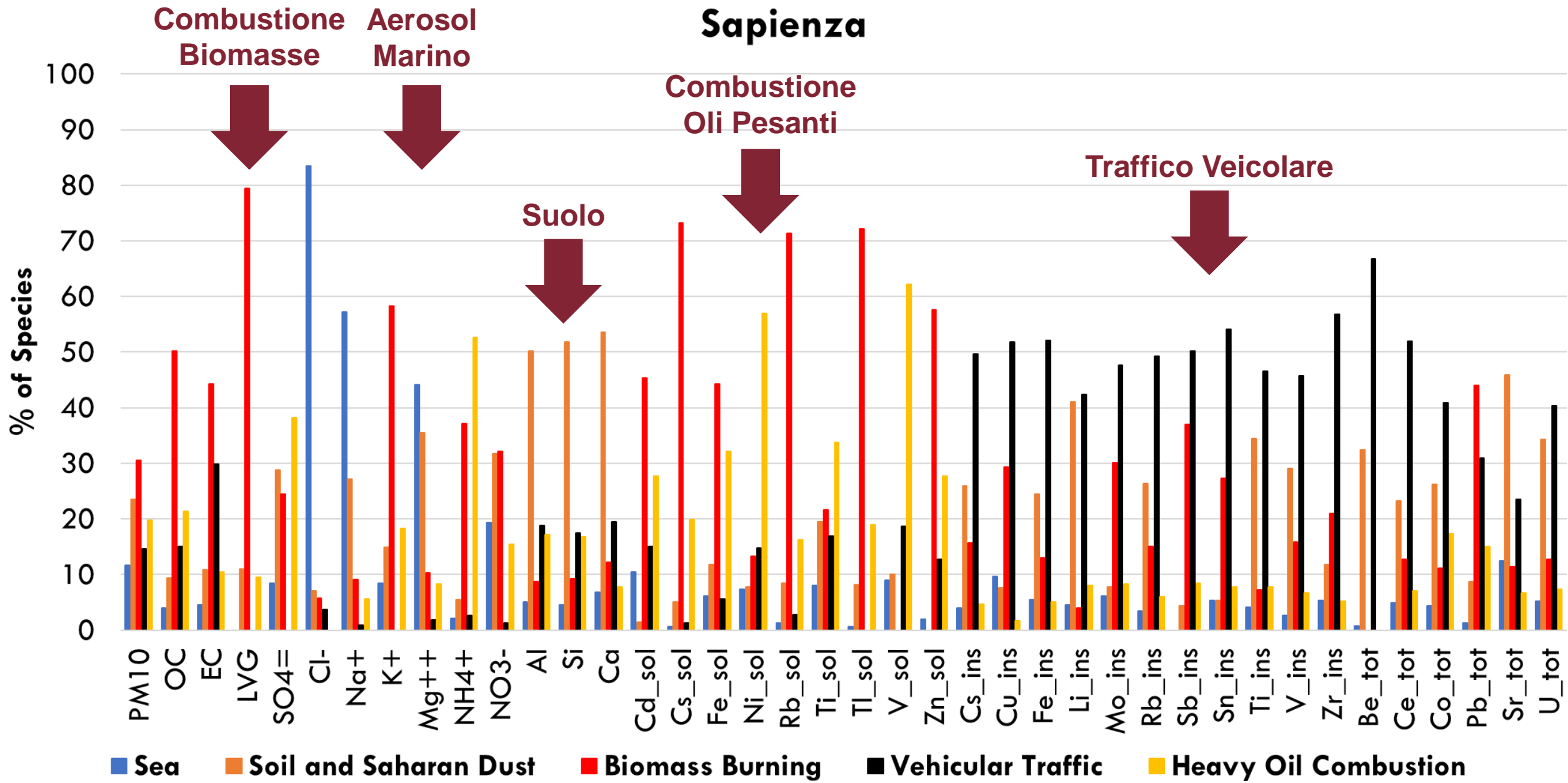


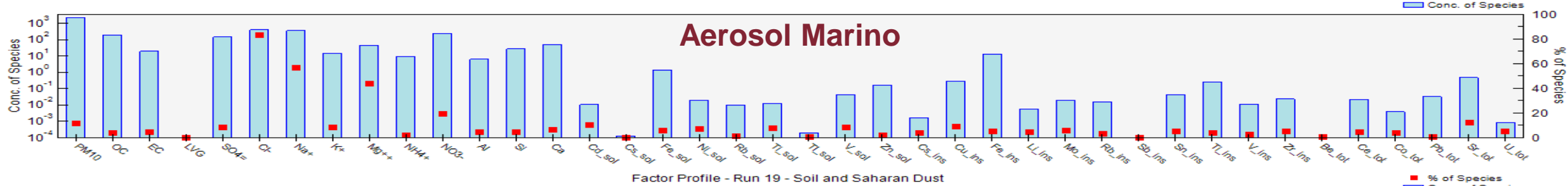
- Concentrazione / Incertezza
- **Selettività nel tracciare diverse sorgenti emissive di PM₁₀**



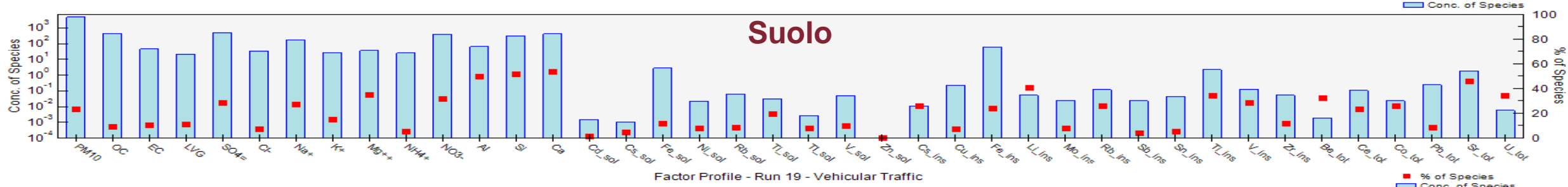
Factor Profiles



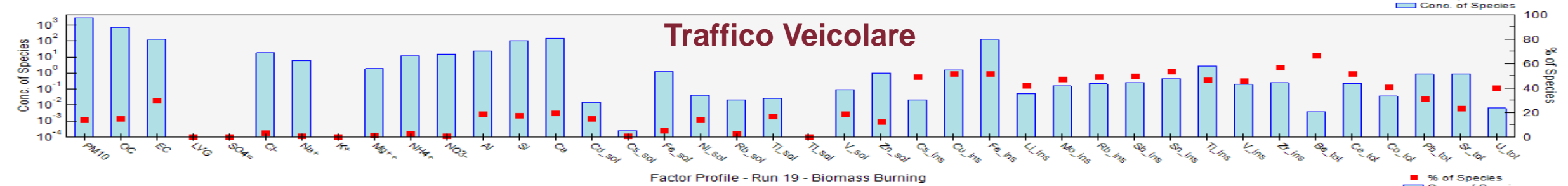




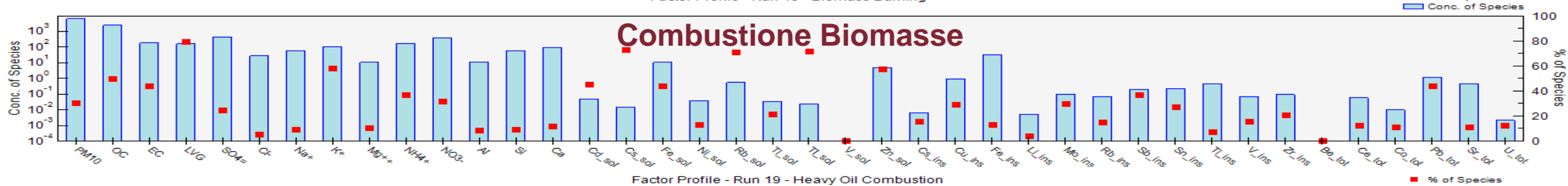
Factor Profile - Run 19 - Soil and Saharan Dust



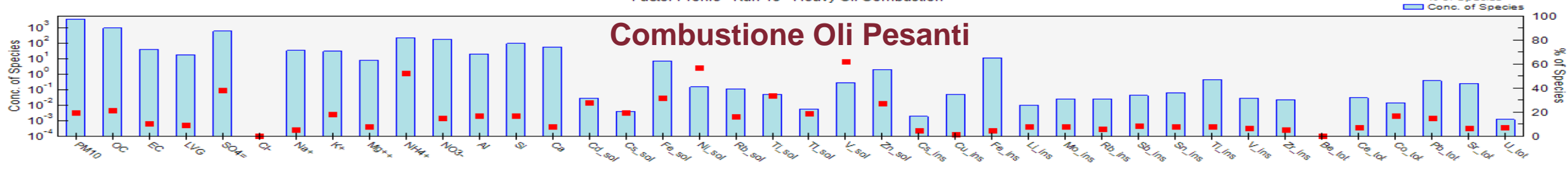
Factor Profile - Run 19 - Vehicular Traffic



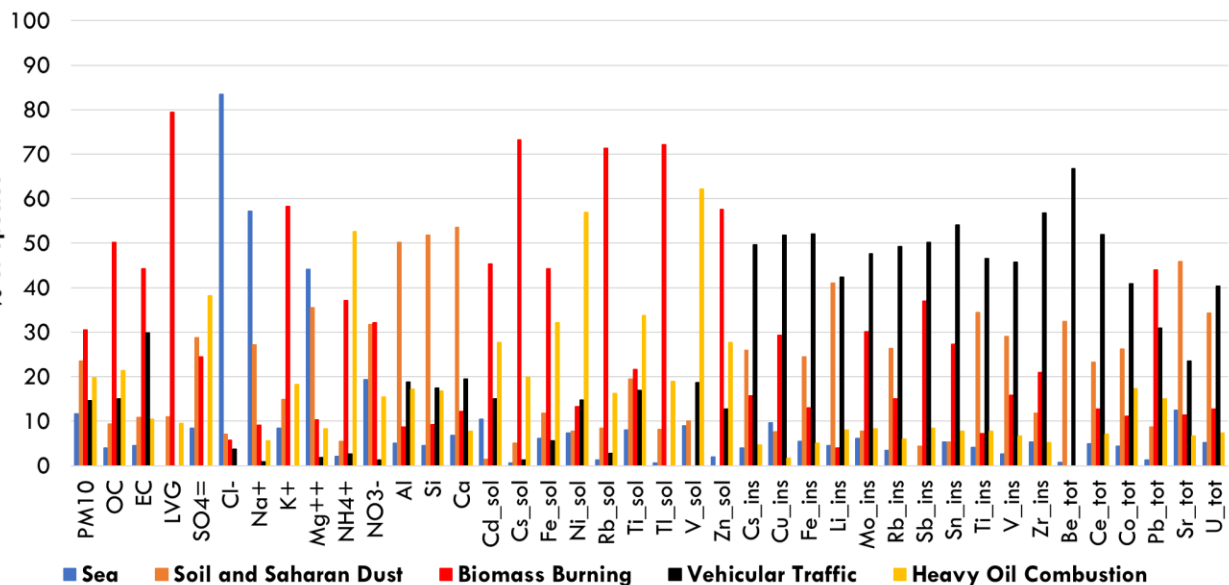
Factor Profile - Run 19 - Biomass Burning



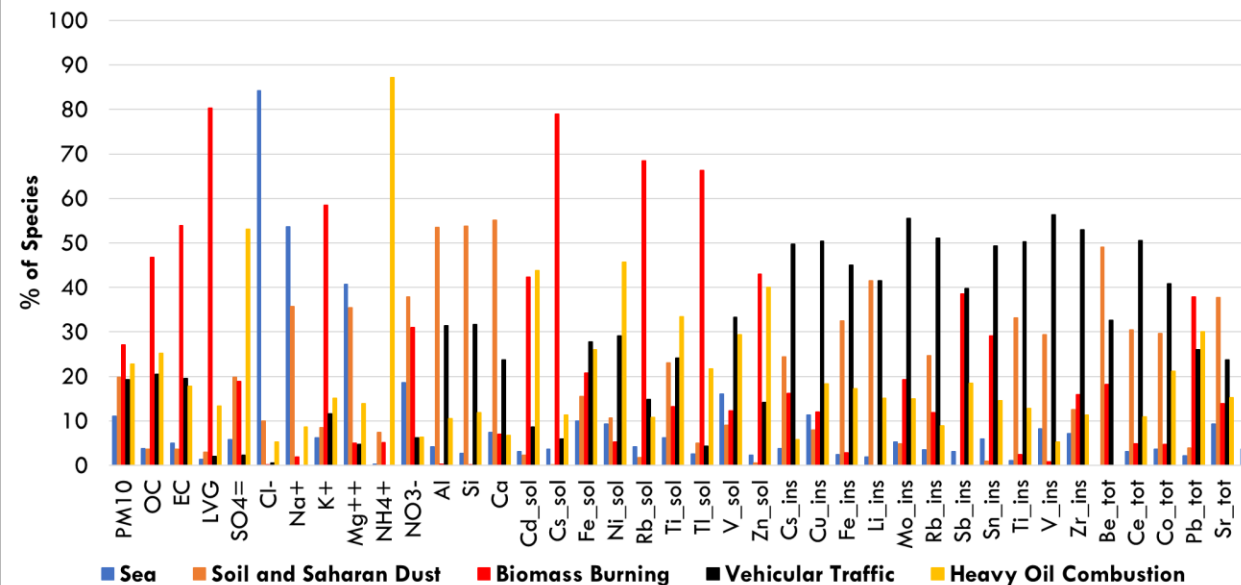
Factor Profile - Run 19 - Heavy Oil Combustion



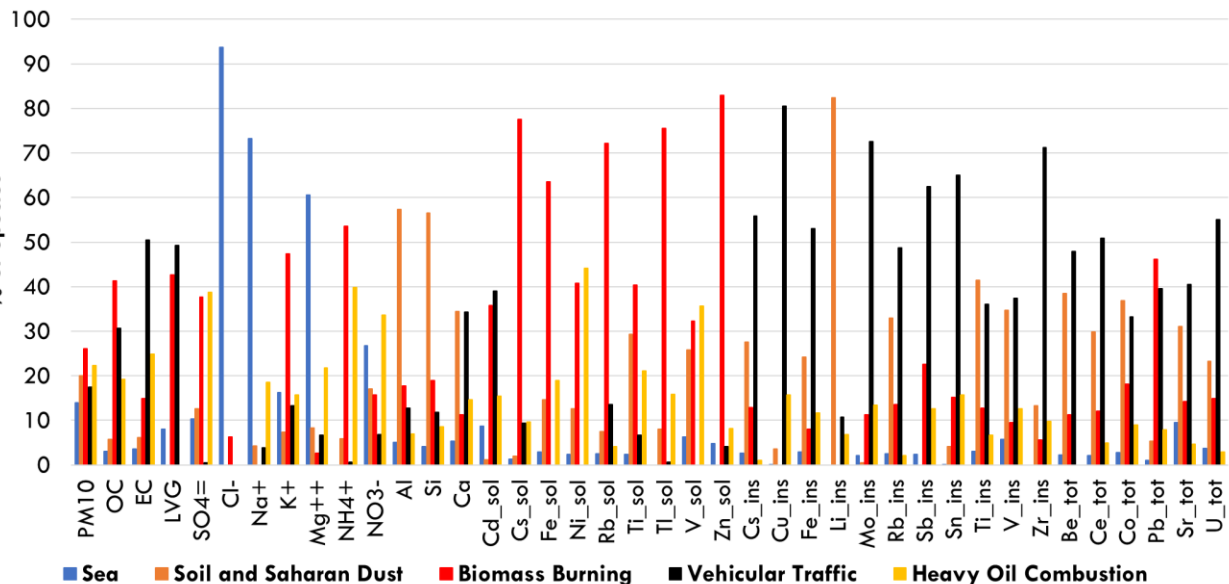
Sapienza



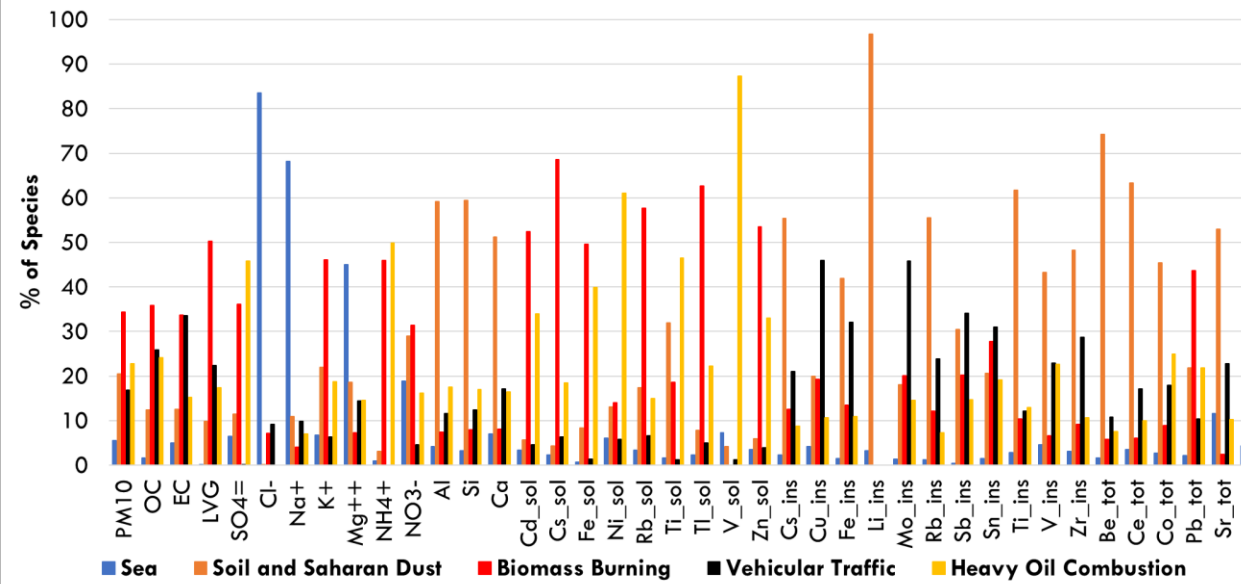
Montelibretti

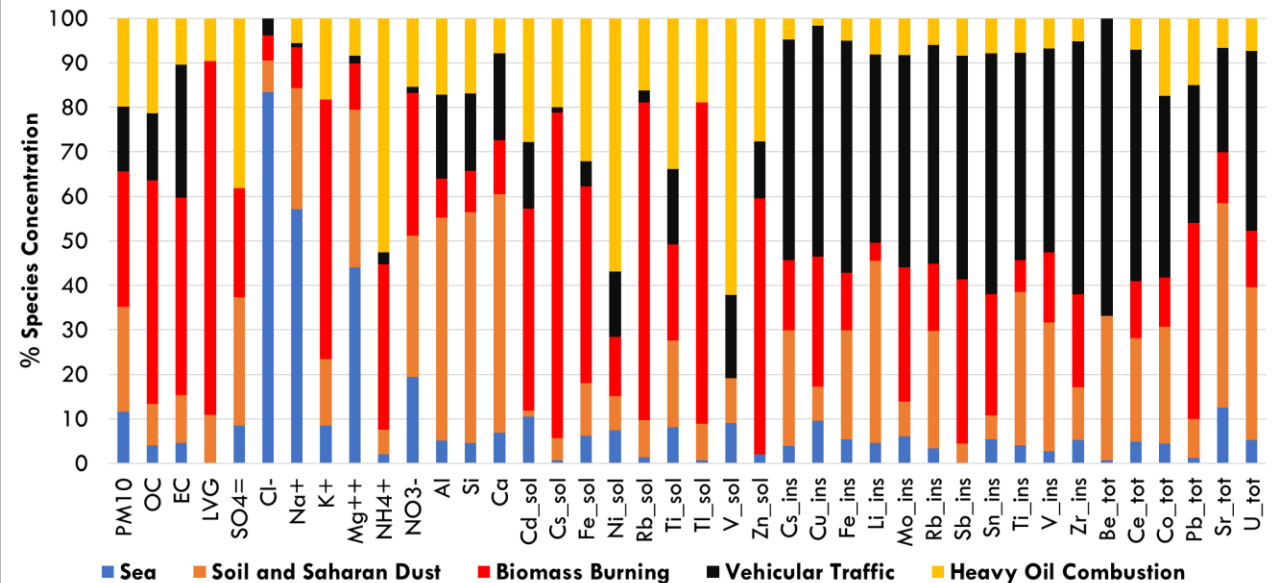
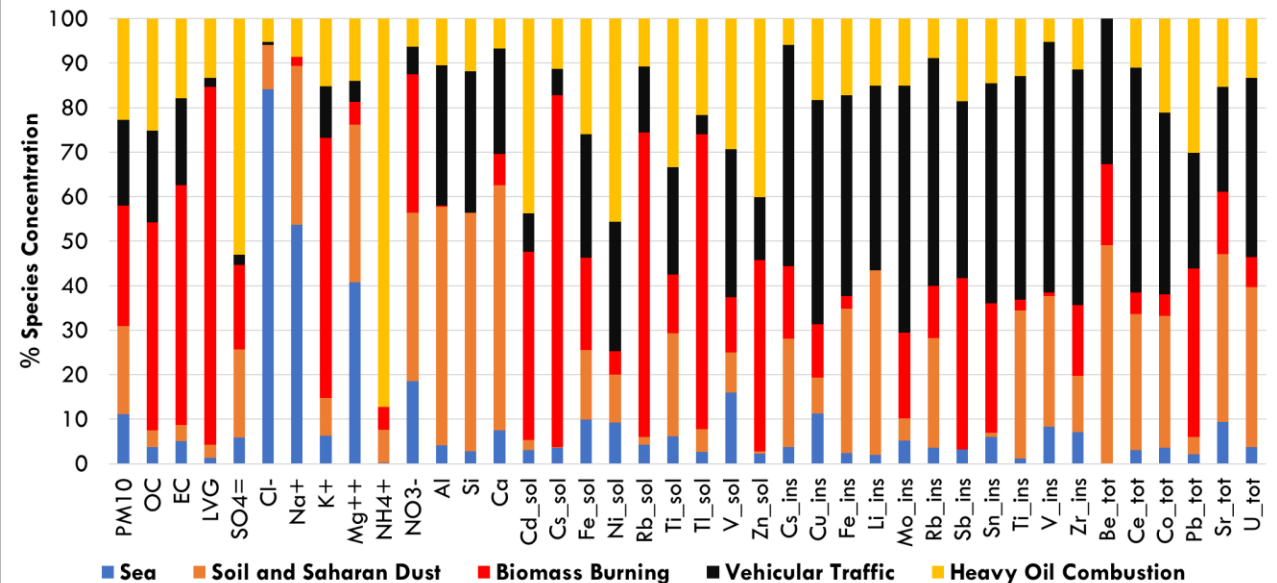
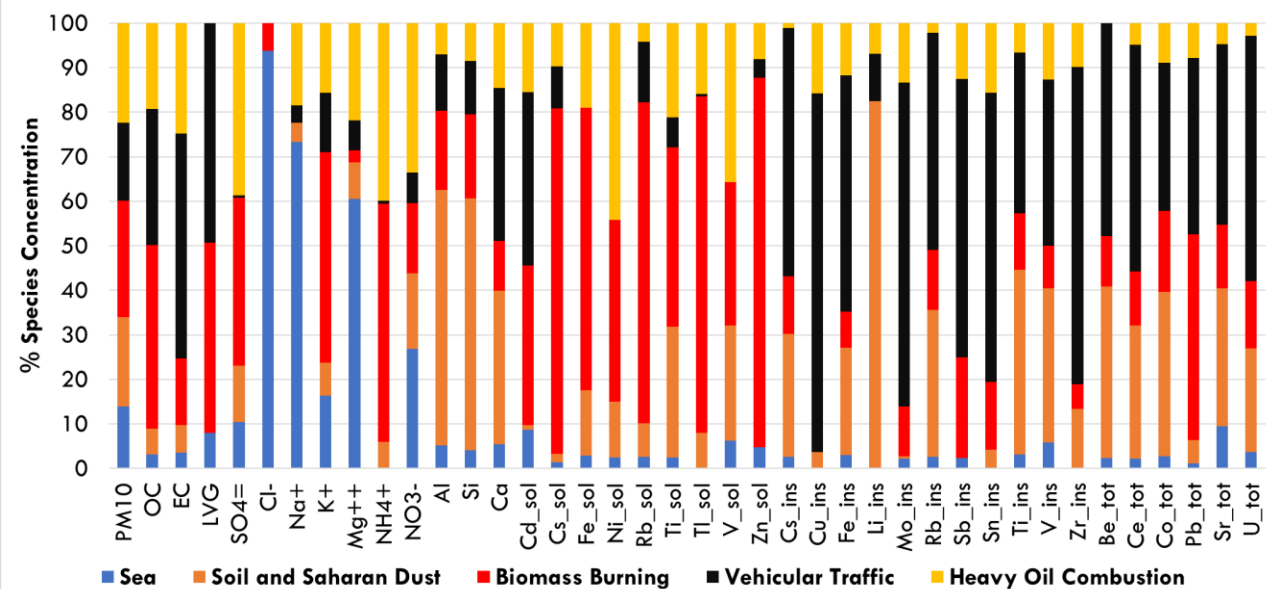
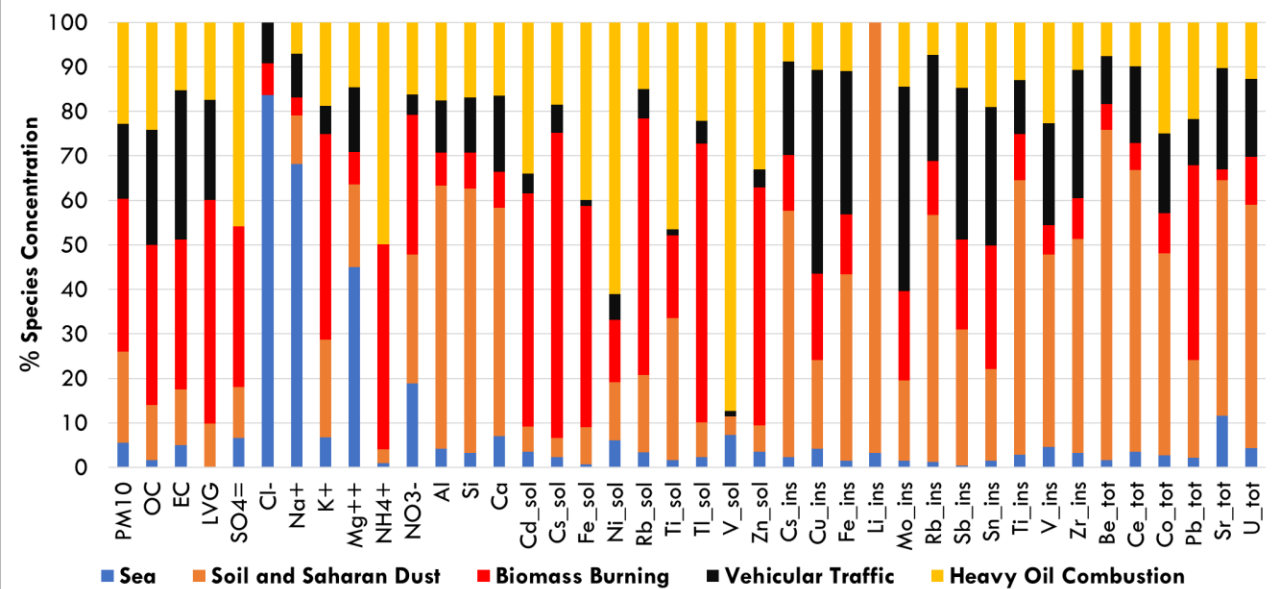


Via Saredo

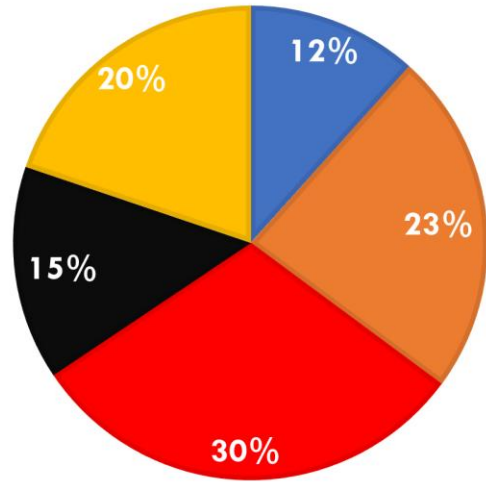


Ceccano



Sapienza**Montelibretti****Via Saredo****Ceccano**

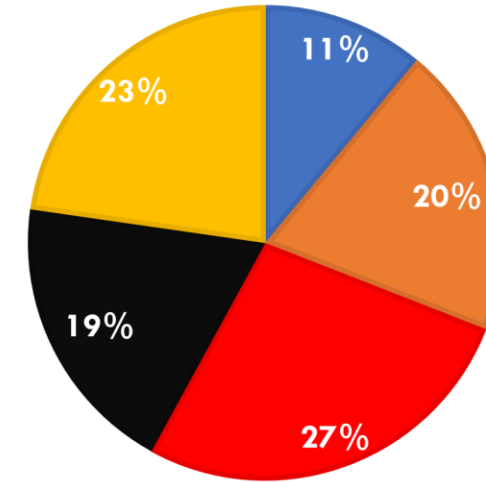
Sapienza - PM₁₀ Factor Contribution



■ Sea ■ Soil and Saharan Dust ■ Biomass Burning
■ Vehicular Traffic ■ Heavy Oil Combustion

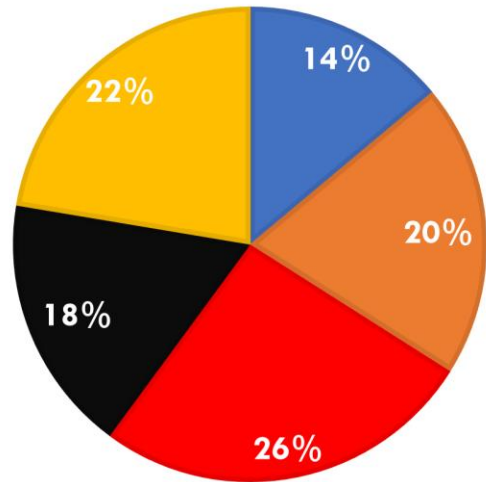
LOCKDOWN

Montelibretti - PM₁₀ Factor Contribution



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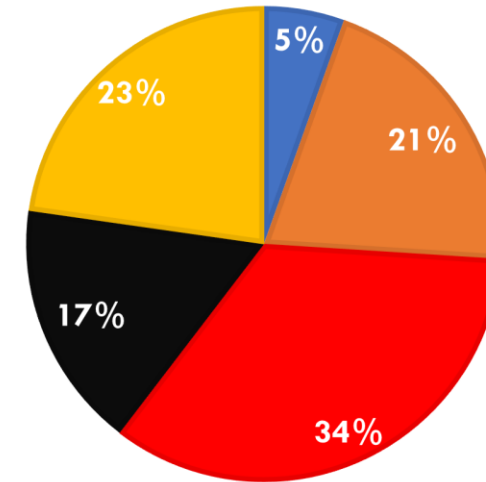
Via Saredo - PM₁₀ Factor Contribution



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LOCKDOWN

Ceccano - PM₁₀ Factor Contribution

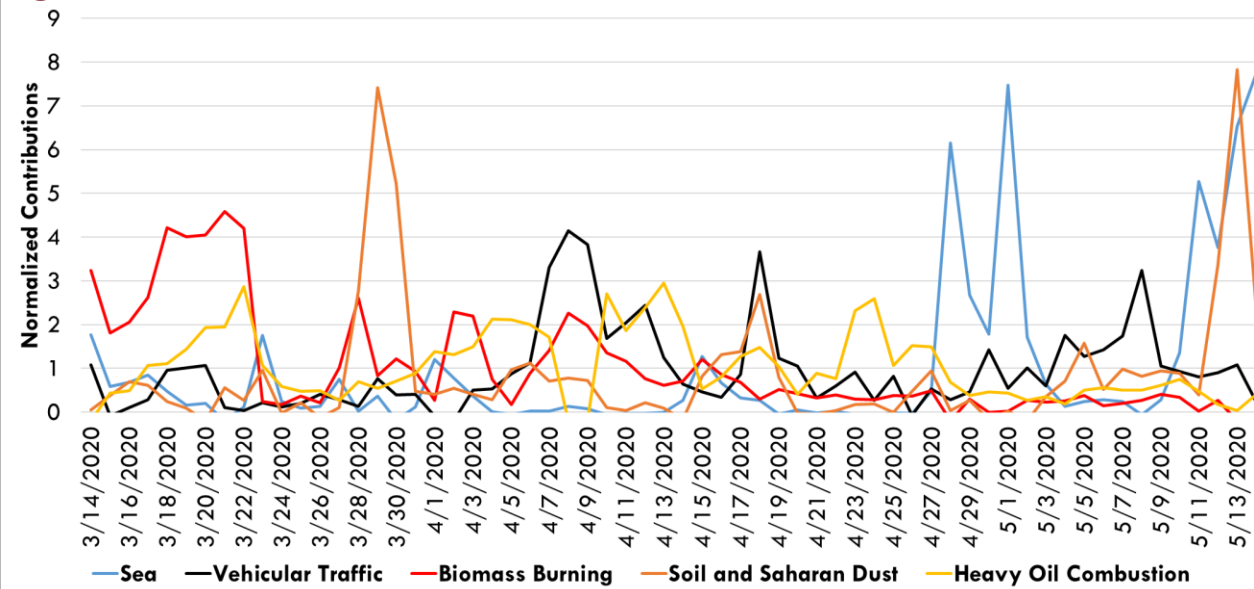
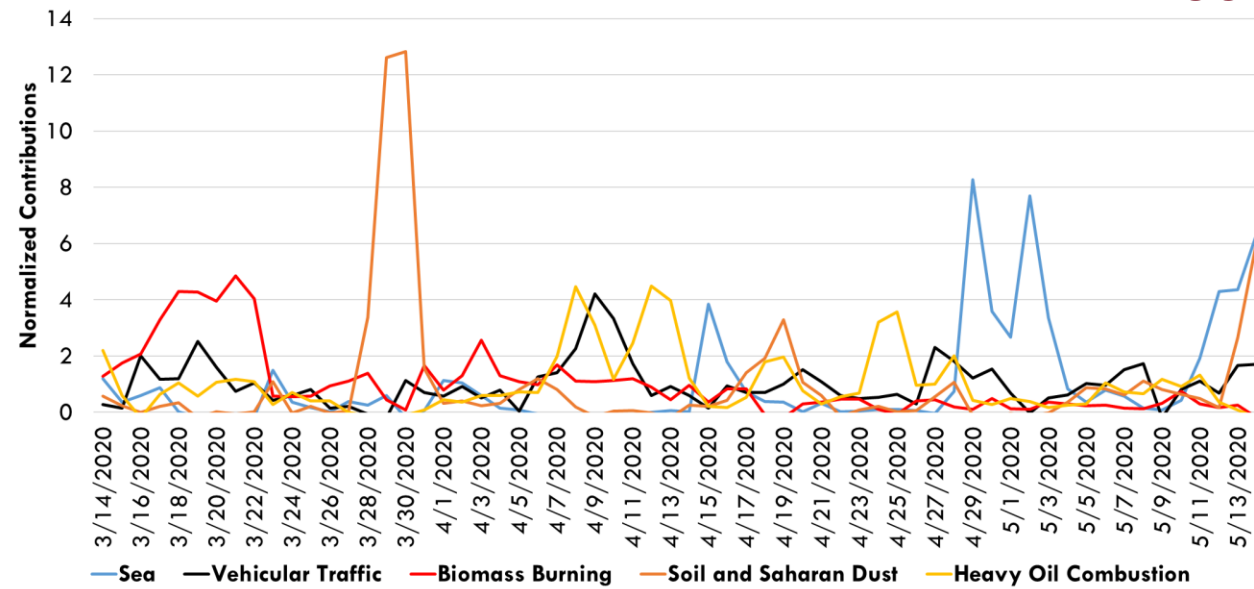


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Sapienza

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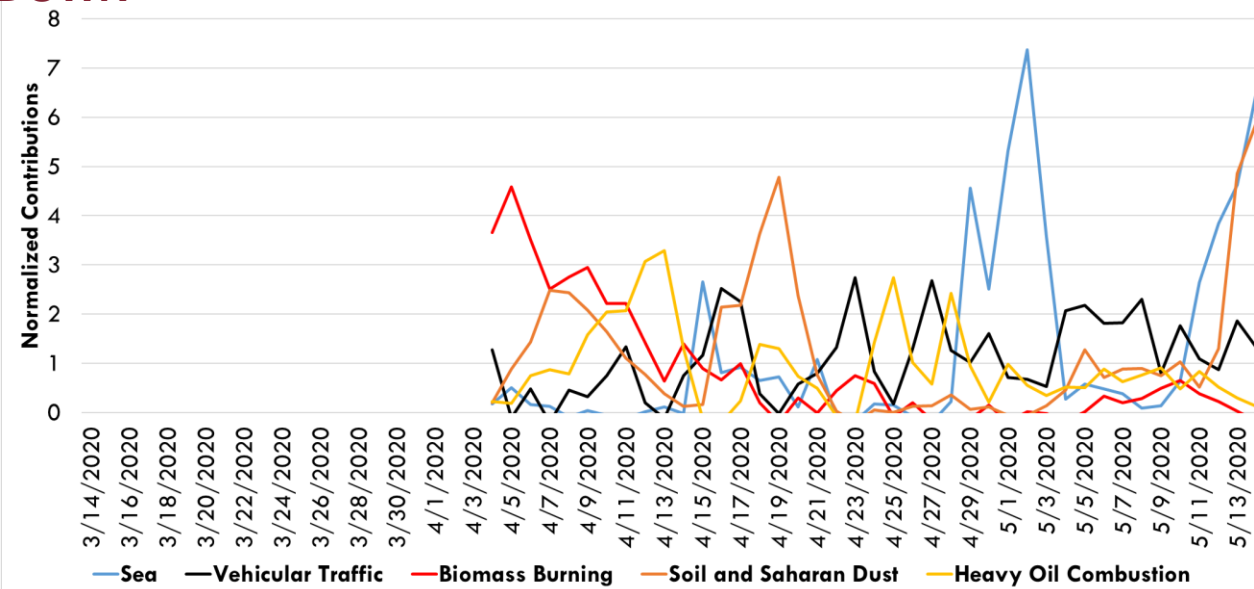
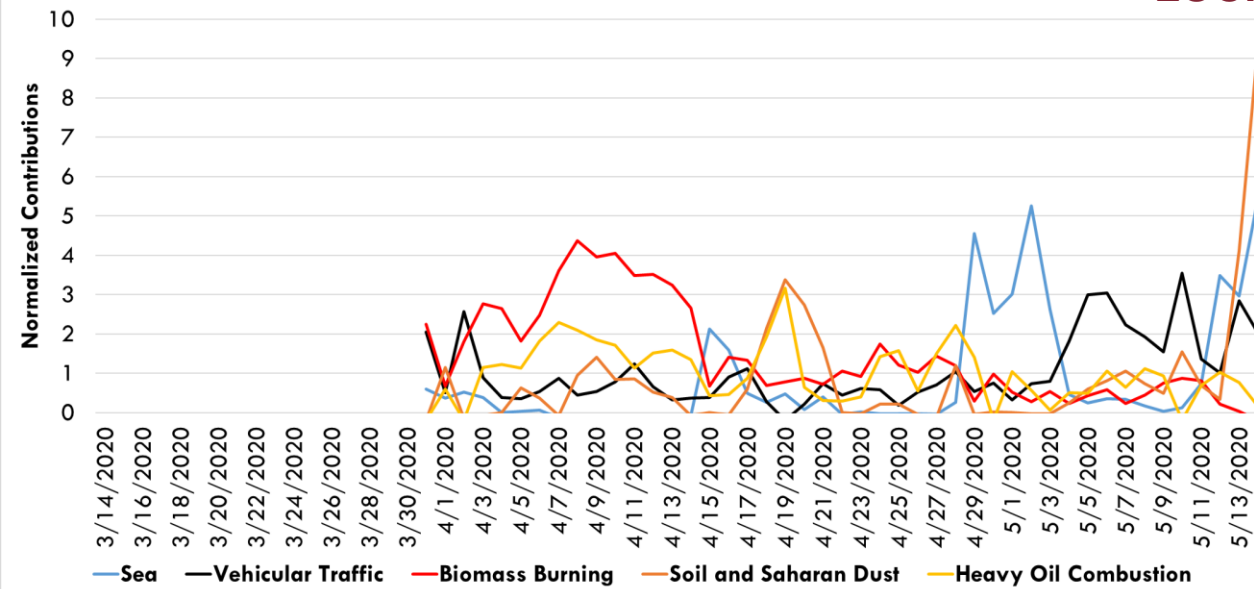
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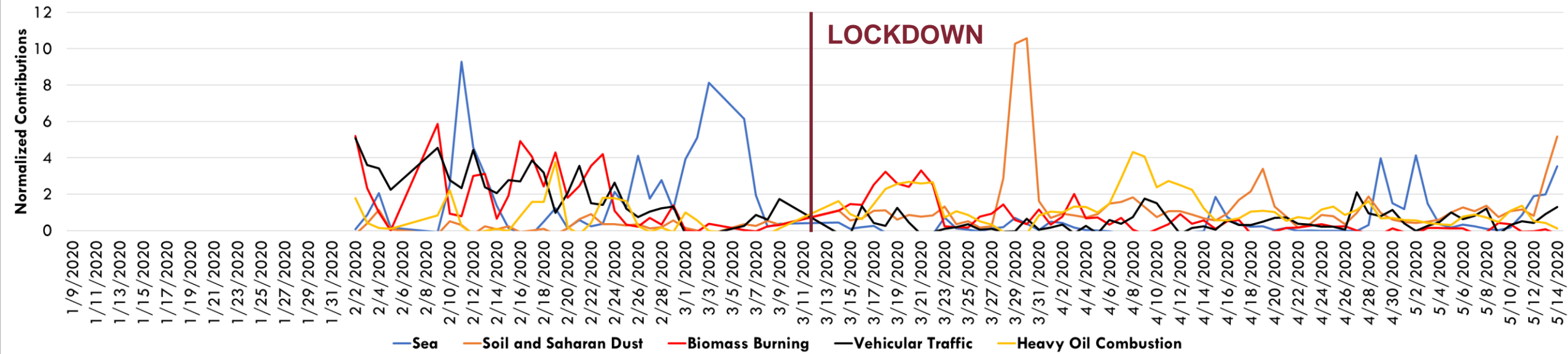
Via Saredo

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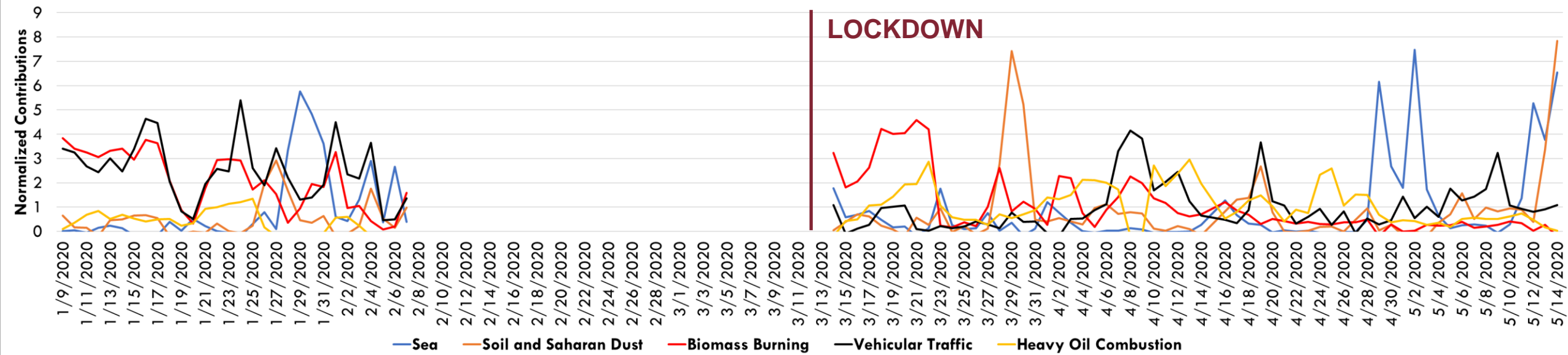
Ceccano



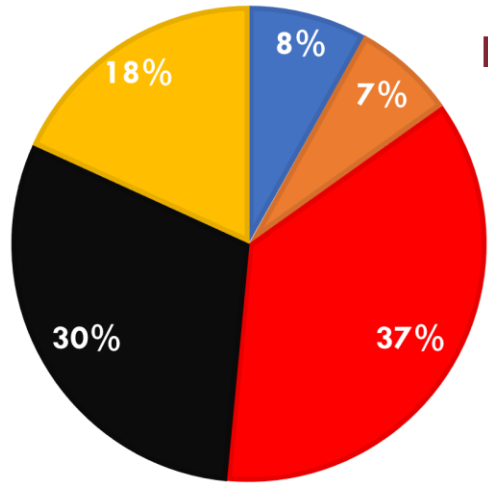
Sapienza



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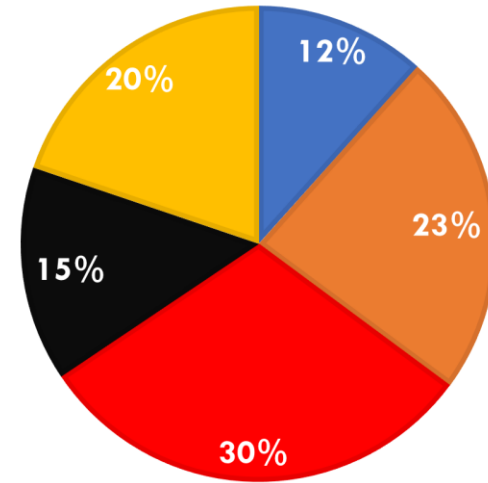
Sapienza Lockdown - PM₁₀ Factor Contribution



PRE-LOCKDOWN

**RIDUZIONE
CONTRIBUTO
TRAFFICO
VEICOLARE**

Sapienza Lockdown - PM₁₀ Factor Contribution

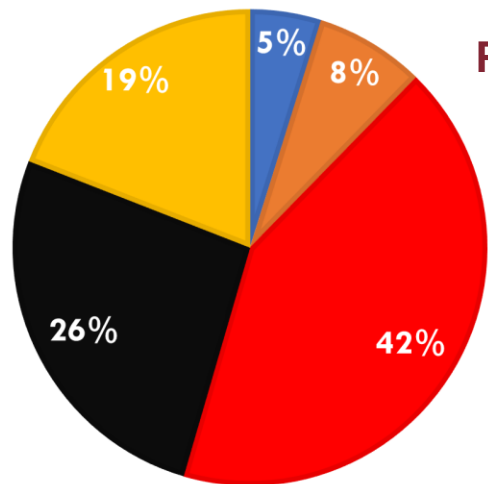


LOCKDOWN

- Sea
- Soil and Saharan Dust
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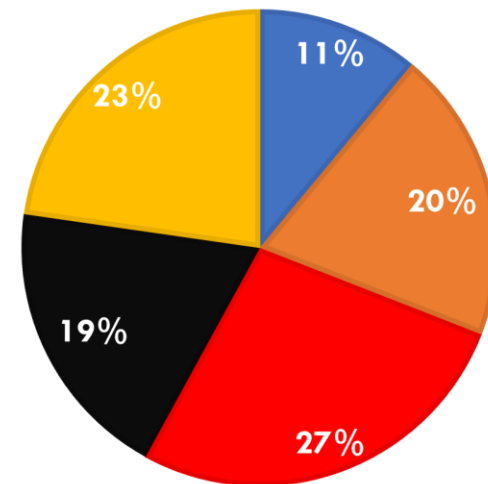
Montelibretti Pre-Lockdown - Factor Contribution to PM₁₀



PRE-LOCKDOWN

**AUMENTO
CONTRIBUTO SUOLO
INCURSIONI
SAHARIANE**

Montelibretti Lockdown - PM₁₀ Factor Contribution



LOCKDOWN

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GRAZIE PER L'ATTENZIONE!!

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