CT8 #1
Spatial **R**epresentativeness of monitoring stations

Preliminary results in Emilia-Romagna

Arpae

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FAIRMODE CT8 #1 applied criteria

- **Annual averaged** ground level concentrations
- A deviation from the modelled concentration at the monitoring stations is allowed within a threshold or **tolerance level of 20%.**
- **Variable tolerance** is examined
- An absolute **minimum 2µg/m³**
- A **non-contiguous** approach is used to outline the SR area and comparison with **contiguous** approach
- Boundaries of the IPR **Air Quality Zones** as the maximal extent of the SR area

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From

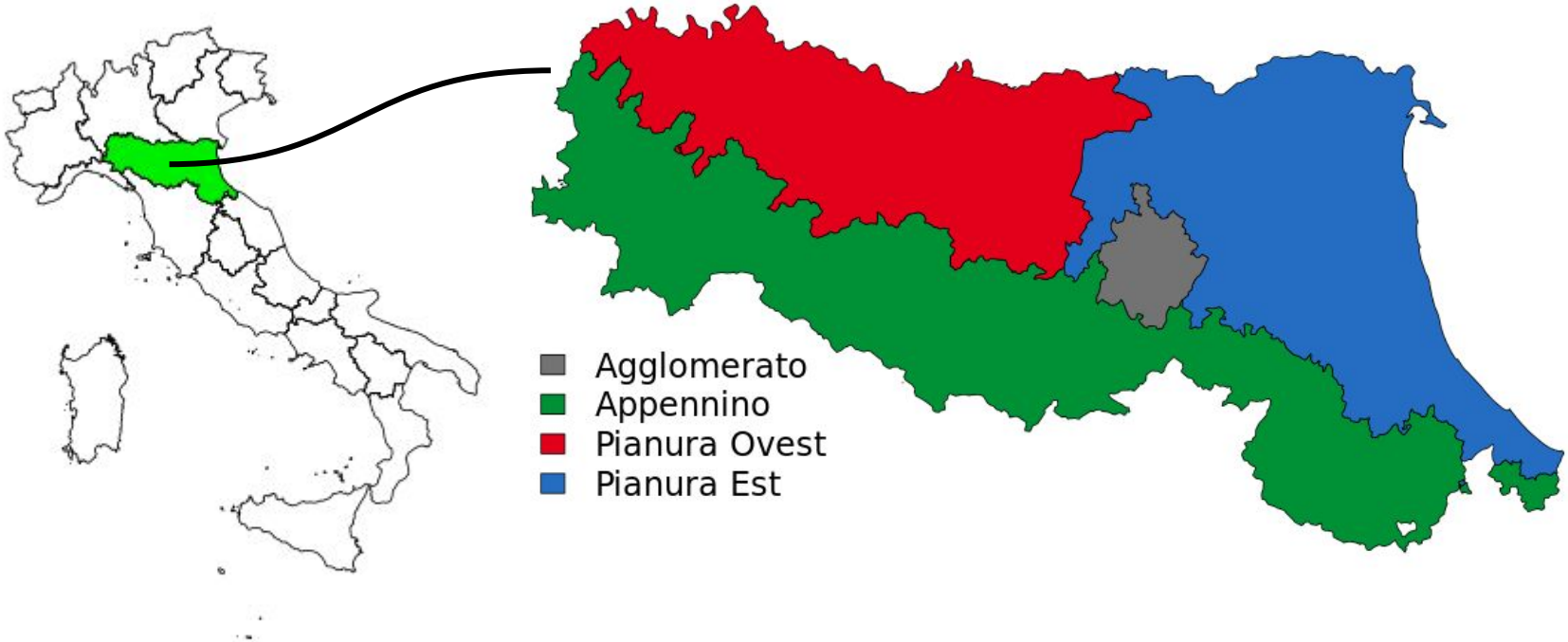
- CTM: **NINFA suite @ Arpae (**CHIMERE + COSMO) 3x3 km^2
- **CTM** and **KED** (Kriging CTM + Observations)
- **PM10 PM2.5 NO2**
- **Background** station locations
- Reference year **2020**

To

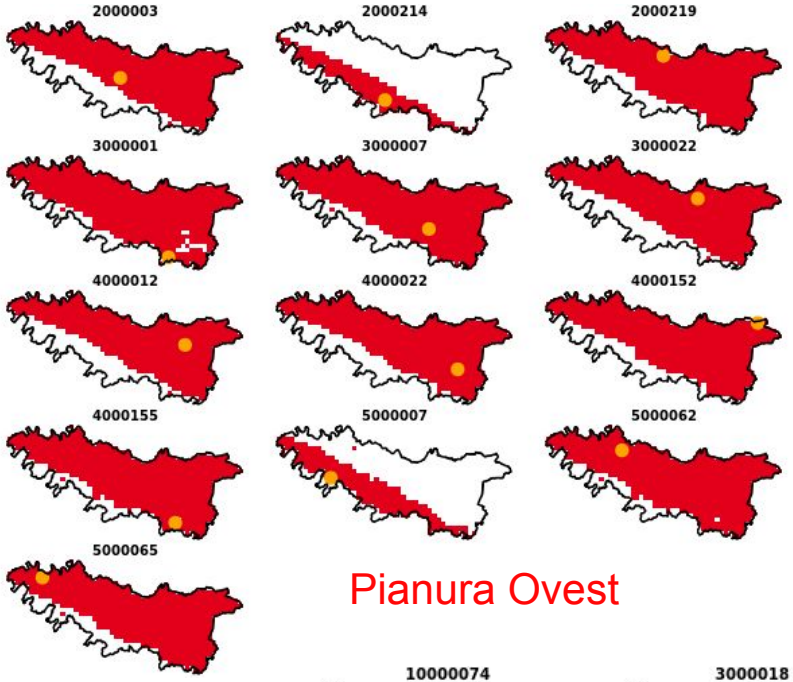
For every station location:

- a **SR map**
- a **plot of the SR area**, calculated **varying the tolerance** from 10% to 20% by step of 1%

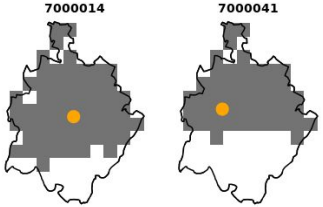
Emilia-Romagna Air Quality Zones



PM10 CTM

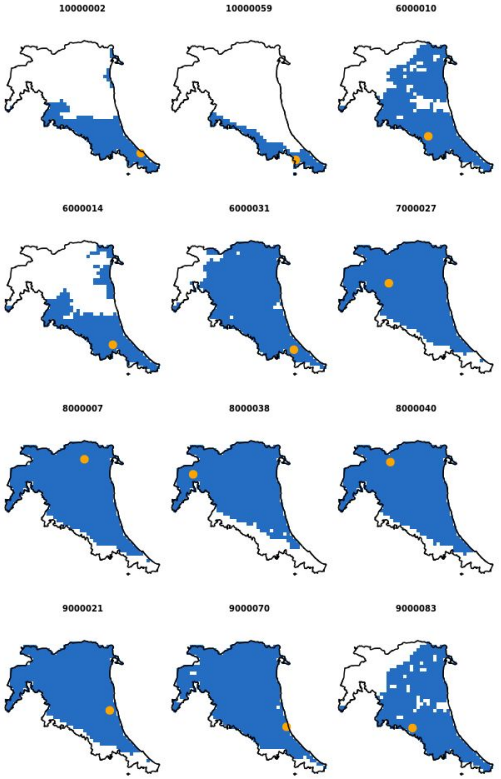


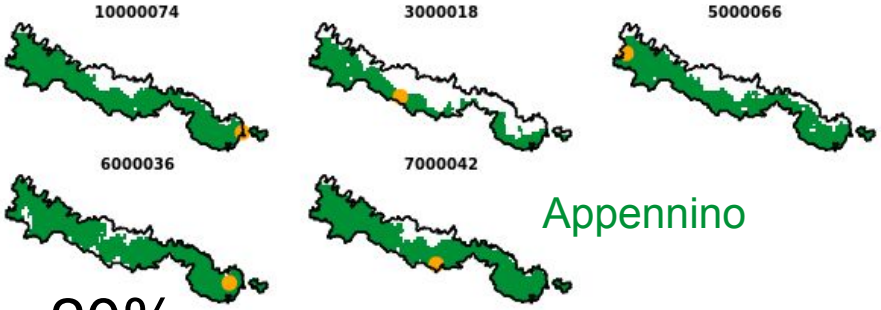
Pianura Ovest



Agglomerato

Pianura Est

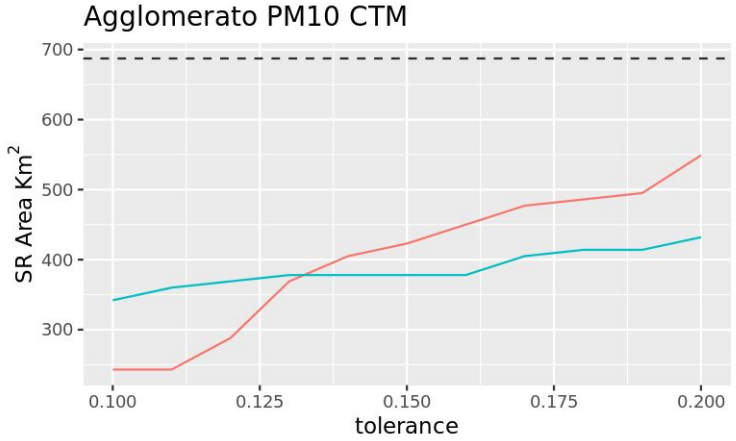


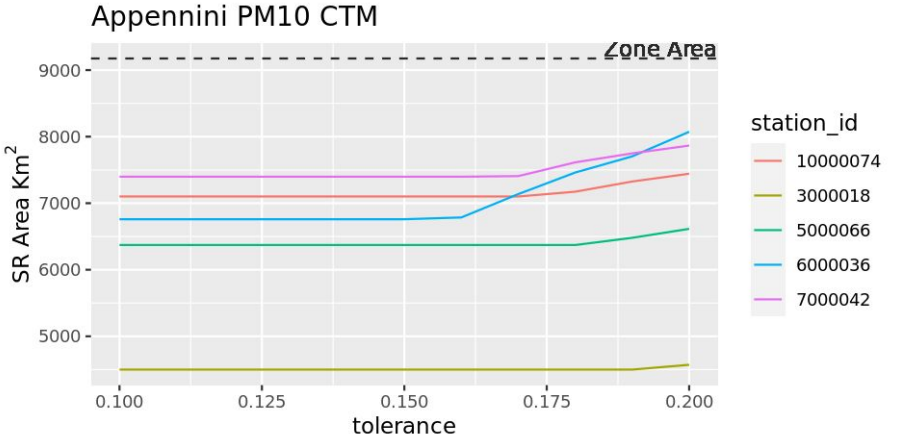


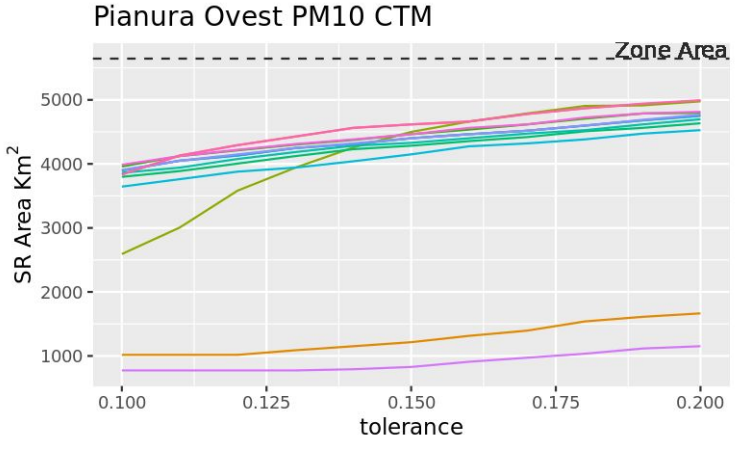
Appennino

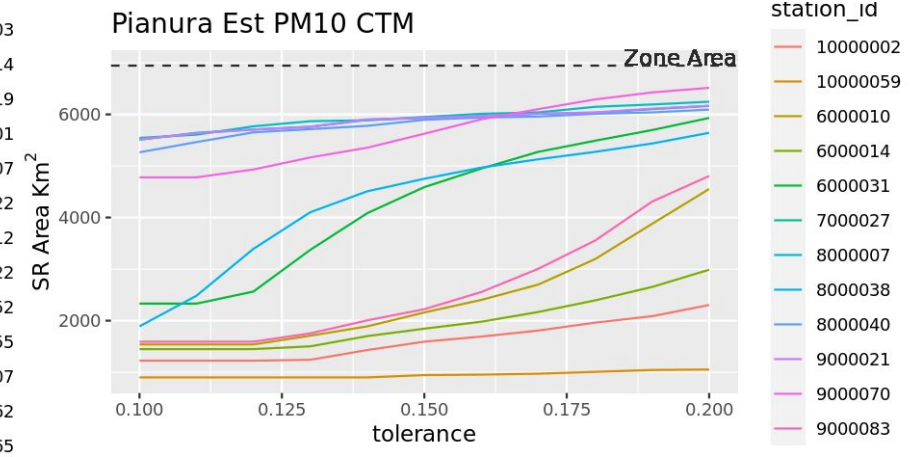
SR tolerance 20%

SR Area vs Tolerance PM10 CTM

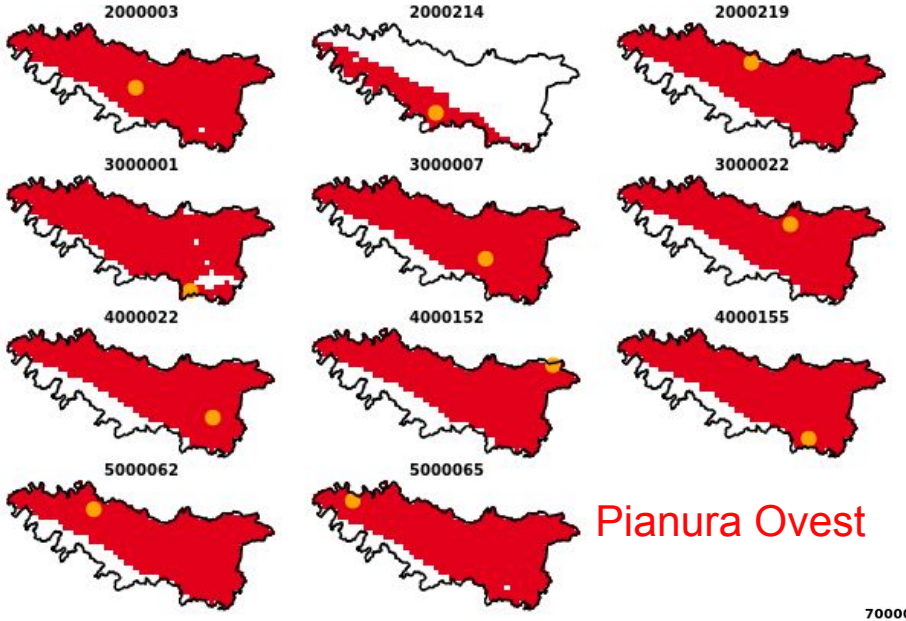






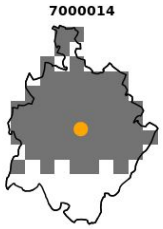


PM2.5 CTM

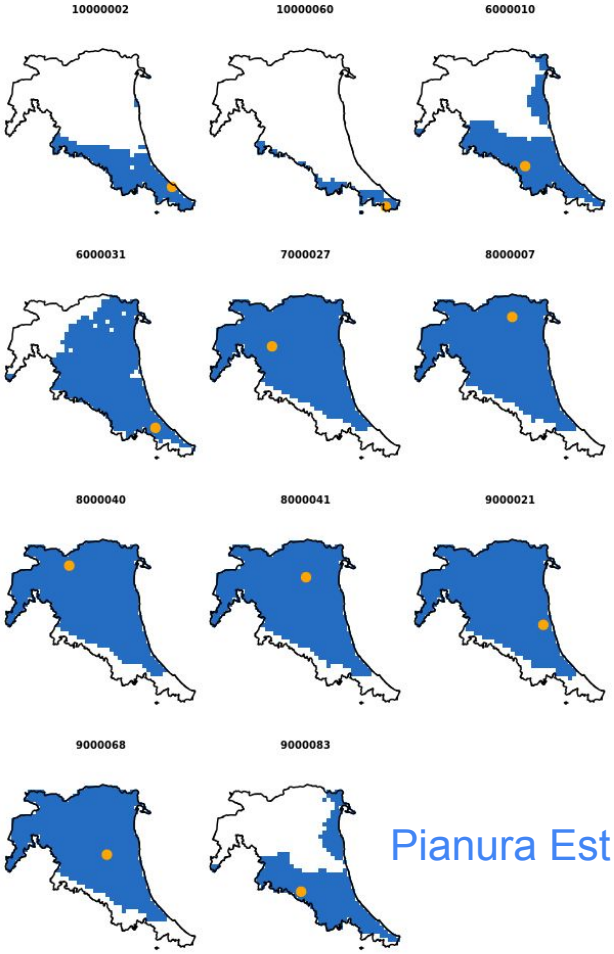


Pianura Ovest

Appennino



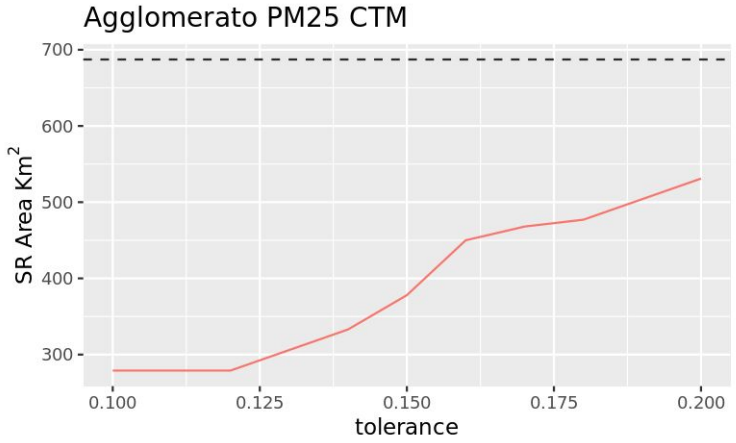
Agglomerato

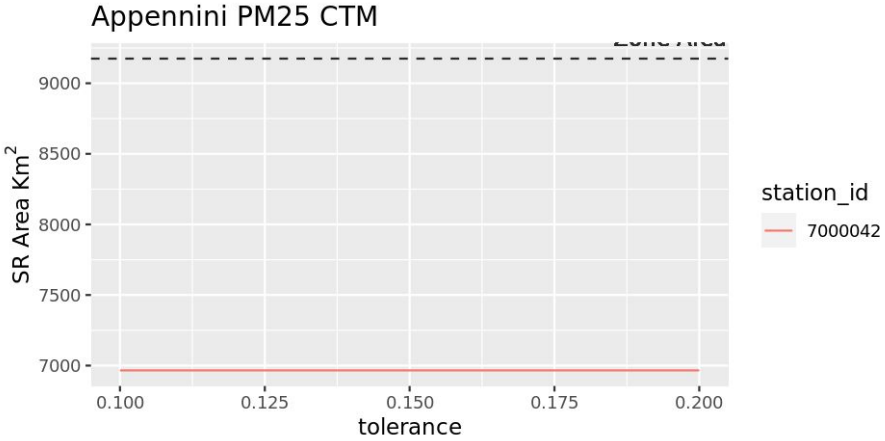


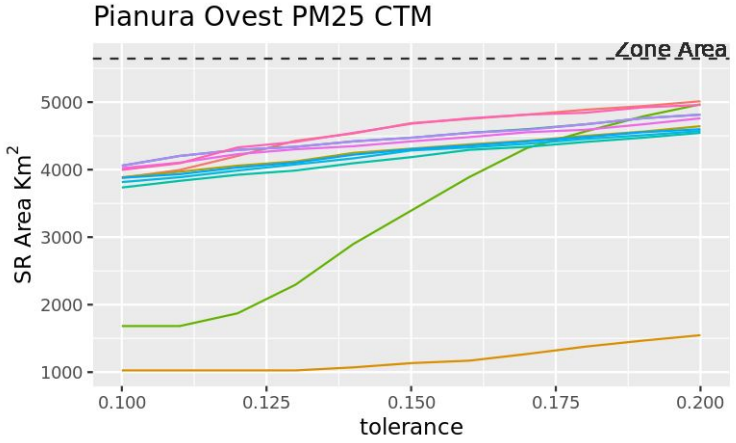
Pianura Est

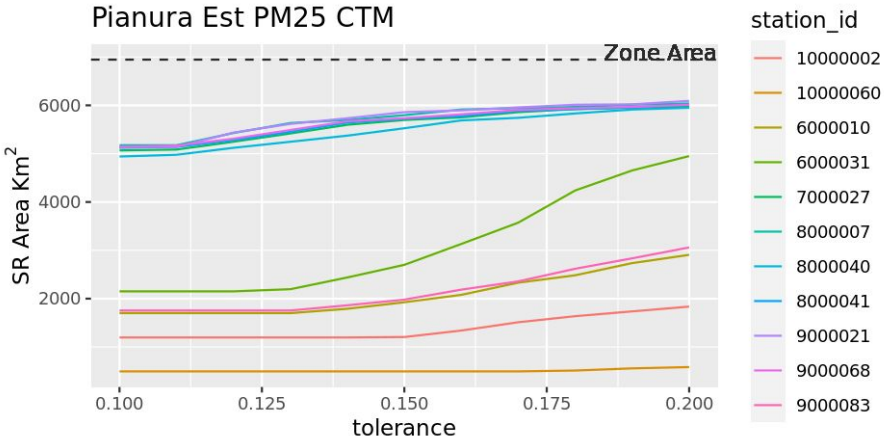
SR tolerance 20%

SR Area vs Tolerance PM2.5 CTM

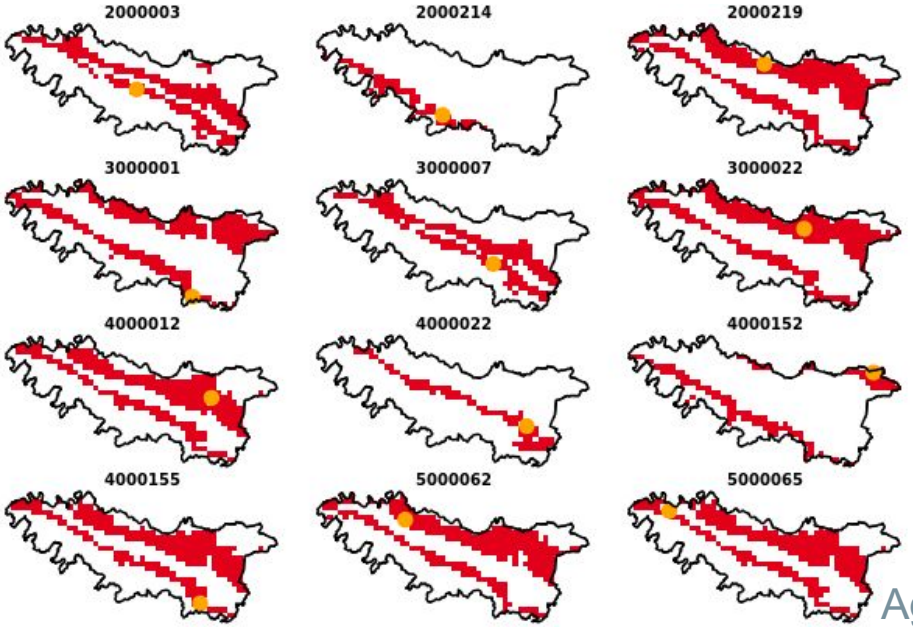




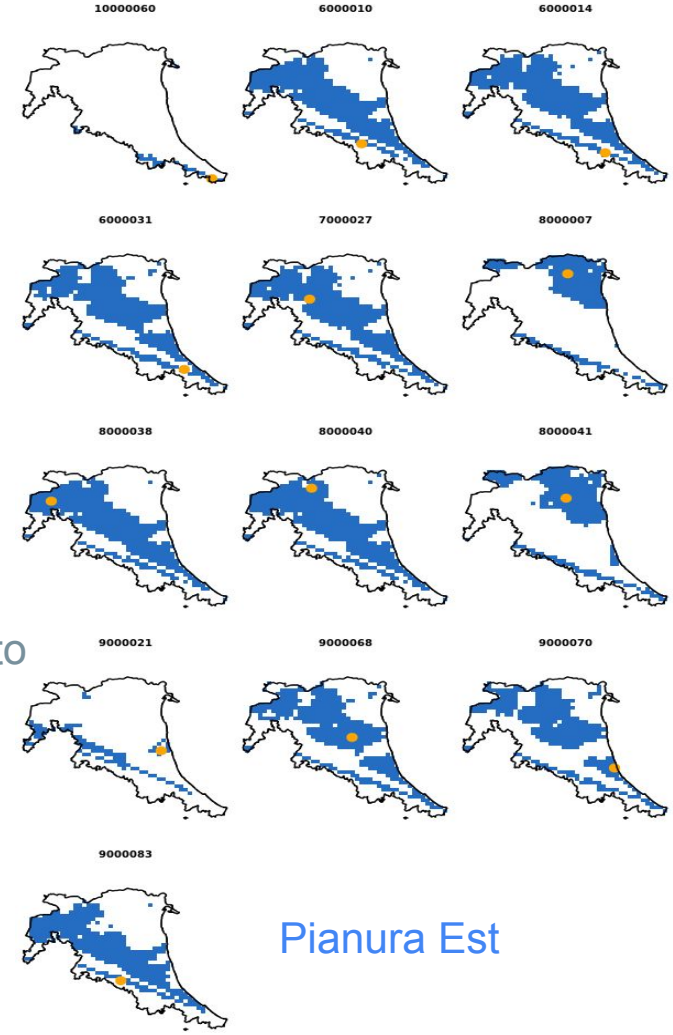




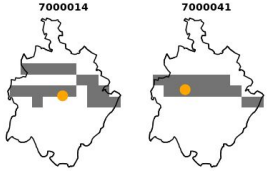
Pianura Ovest

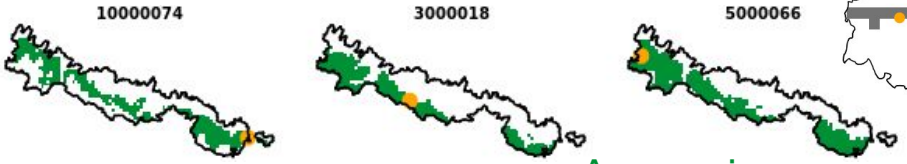


NO2
CTM



Agglomerato



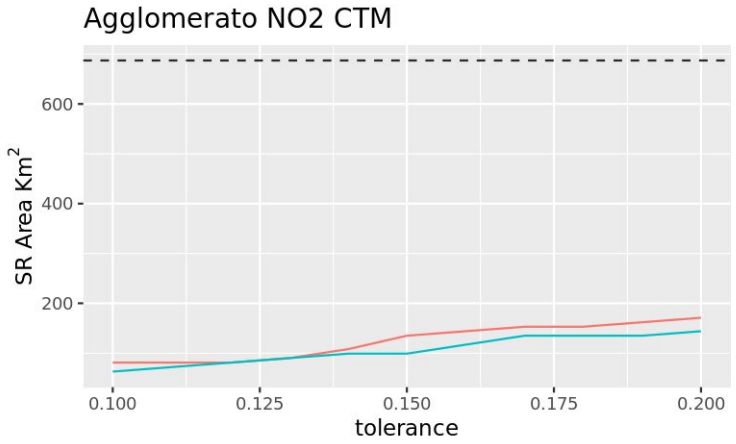


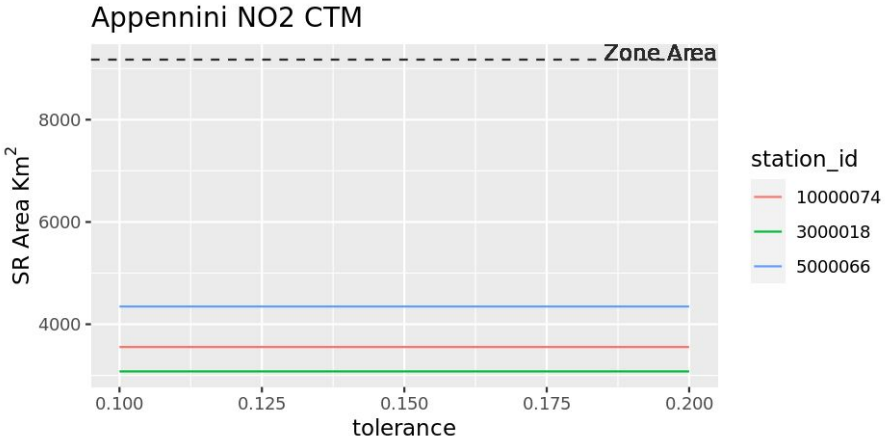
Appennino

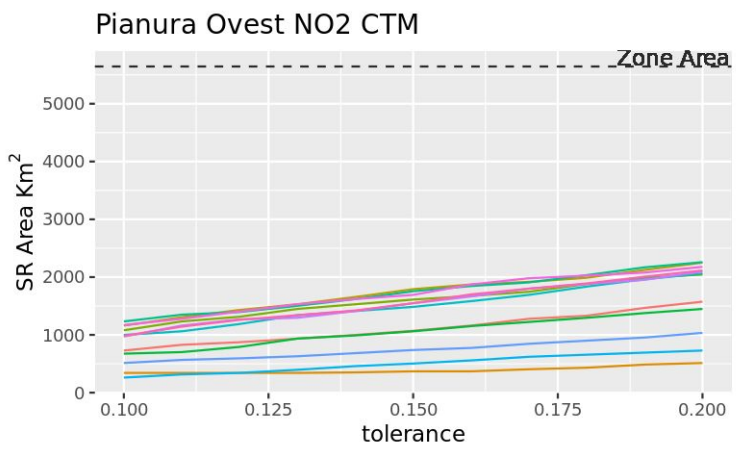
Pianura Est

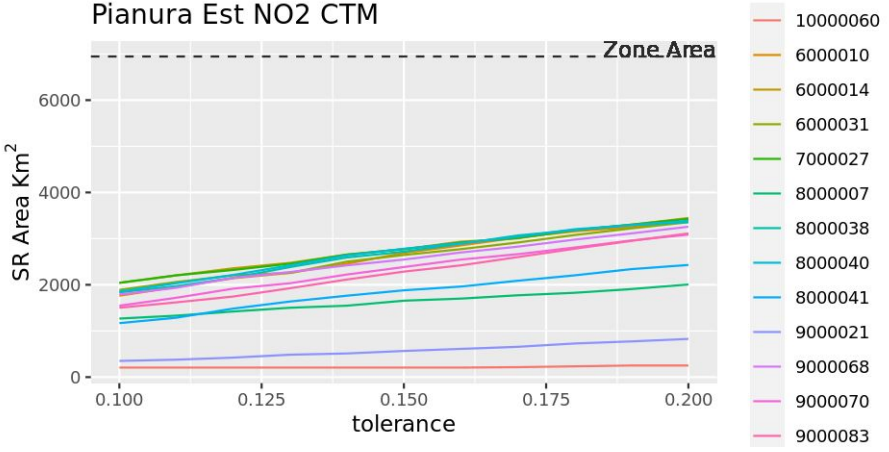
SR tolerance 20%

SR Area vs Tolerance NO2 CTM

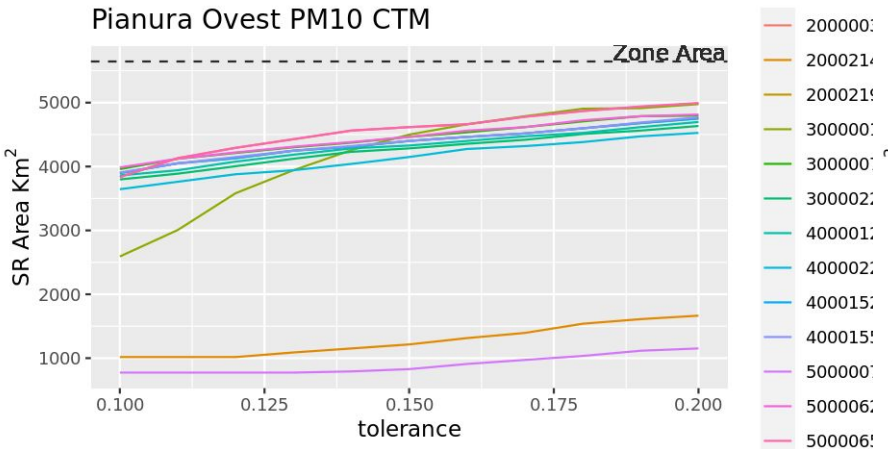


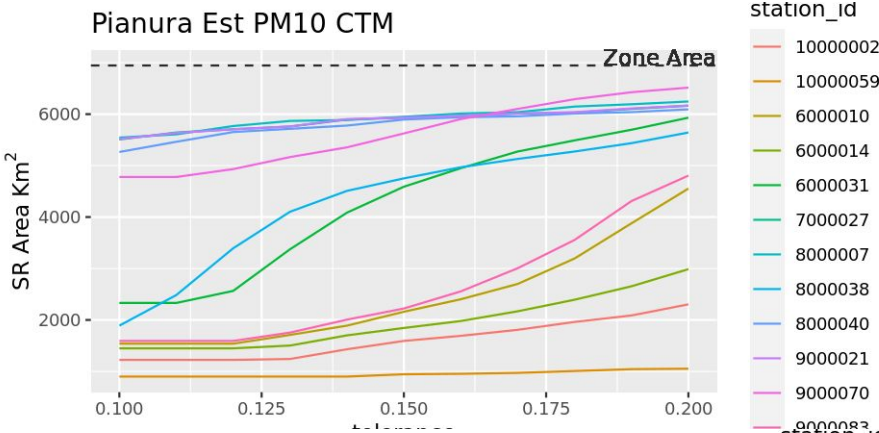


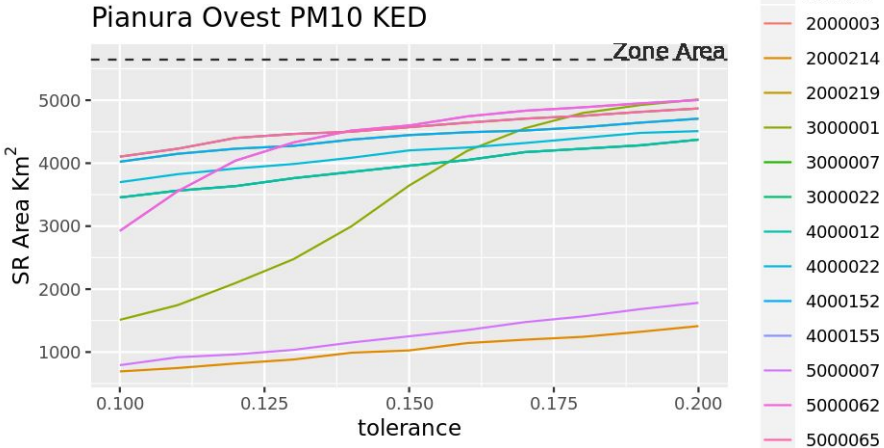


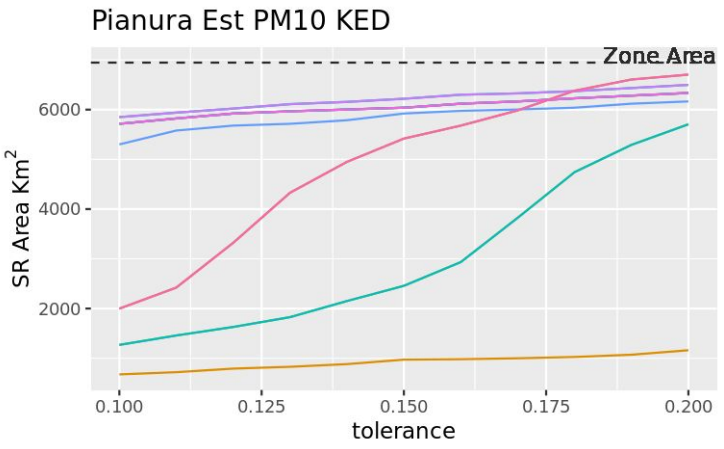


CTM vs KED Pianura Ovest Pianura Est

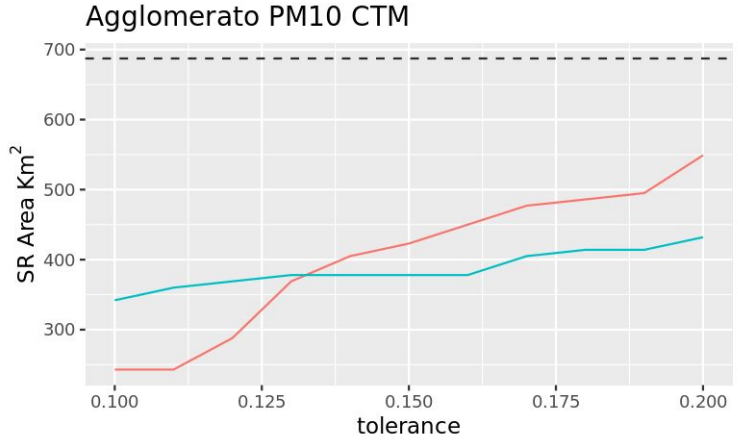


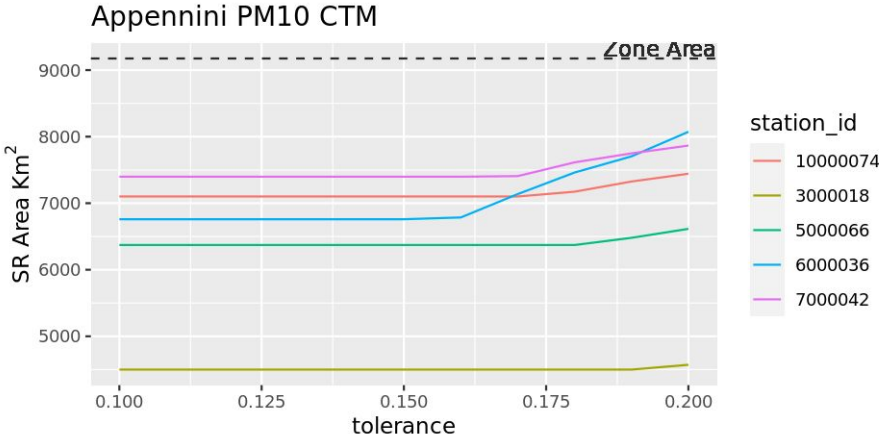


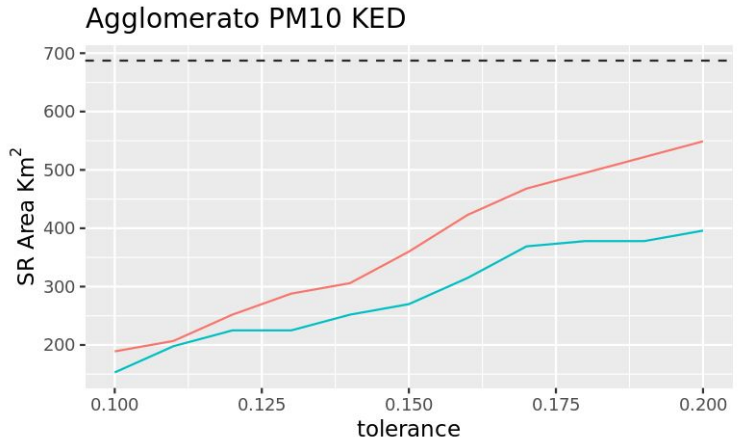


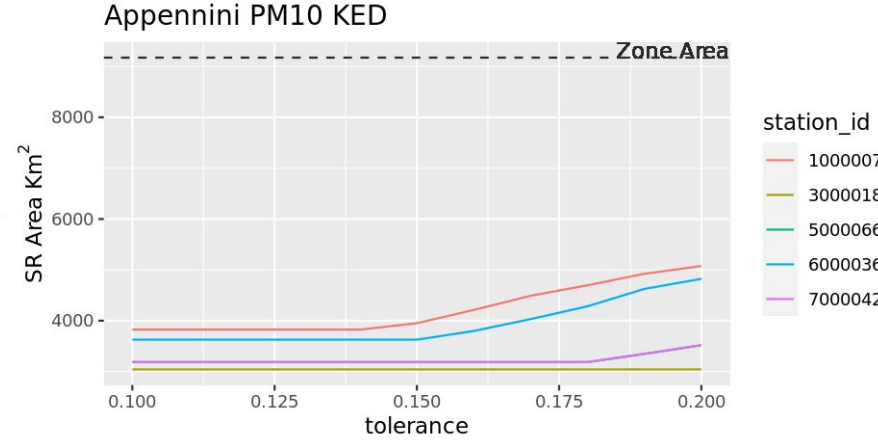


CTM vs KED Agglomerato Appennino









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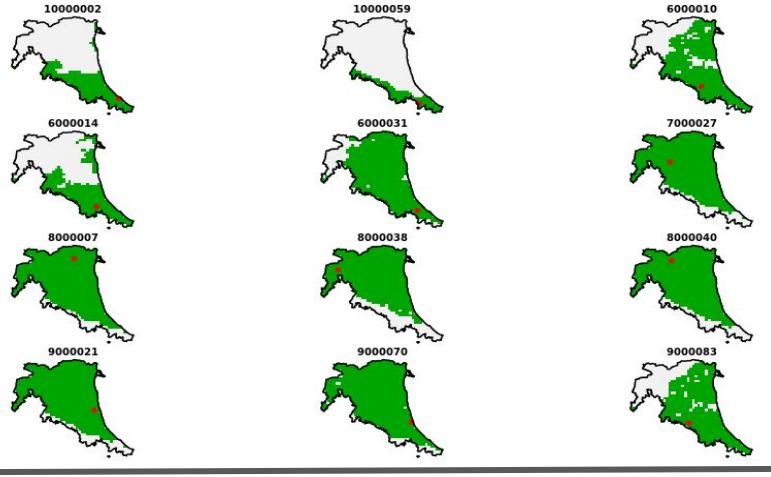
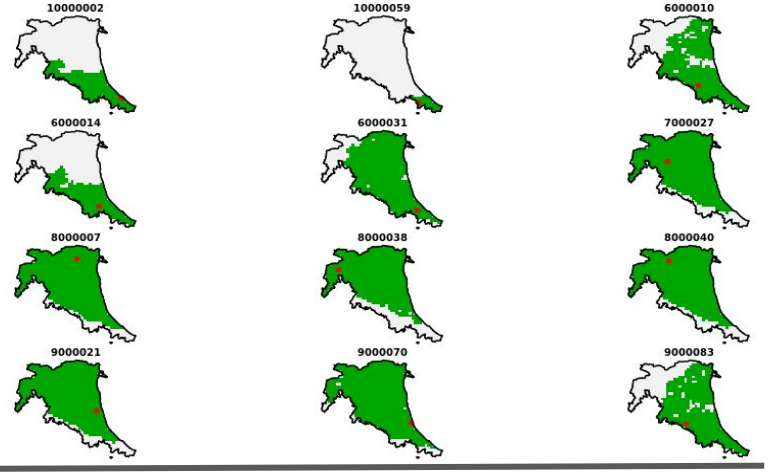
non contiguous area

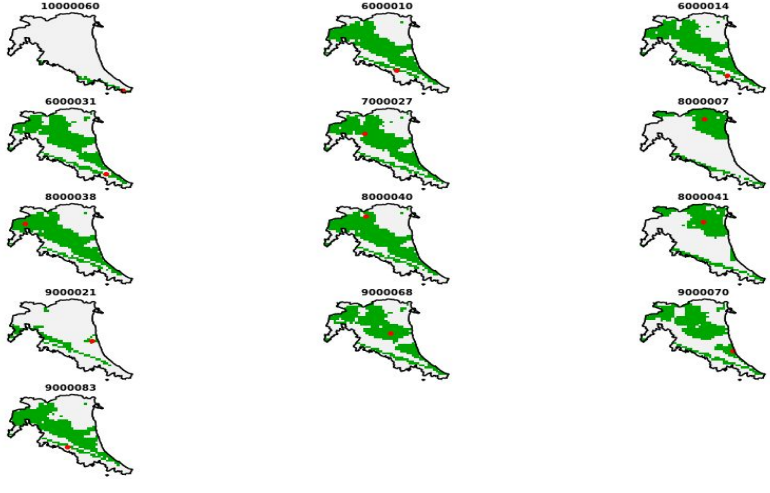
contiguous area

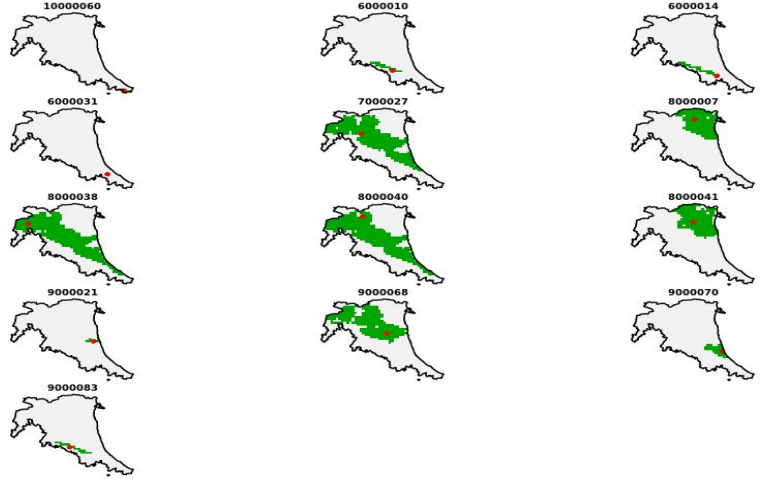
PM10





NO2





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Outcome

- Most stations have a wide SR area in flat areas for PM
- For NO2 the SR areas are generally smaller
- For NO2 the contiguous/non-contiguous approach has an impact
- CTM or KED has little impact. More investigation required

Future Work

- Extend the analysis to more years
- Make the analysis also for O3
- ...

Thank you for your attention!

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Thanks to Giovanni Bonafè for providing useful scripts https://github.com/jobonaf/spatial-representativeness