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Controls on the spatial distribution and temporal variation of anthropogenic tracers in the sediments of the Paris sewerage system.

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The urban environment is made up of a complex and changing mosaic of spatial patterns. To what extent the spatial heterogeneities of this mosaic determine the quality of life or social, economic or health inequalities? Within the framework of the ANR EGOUT project, we assume that the spatial distribution and temporal evolution of mineral and organic tracers archived in the sediments of the Parisian sewerage networks can help deciphering the diversity of aboveground conditions, and their temporal trajectory.

We compiled the geochemical results acquired before cleaning out operations on sediments accumulated in more than 100 silt traps (STs) that line the sewerage network of Paris. Each ST receives sediments that transit through the Parisian combined (wastewater and stormwater) sewer system. These analyses concern granulometry, metals and polycyclic aromatic hydrocarbons (PAHs). These regulatory analyses (which guide the nature of the sediments treatment processes to be implemented) have been realised since the year 2000, with cleaning out, and thus measurement frequencies, varying from one ST to another. They therefore allow addressing not only geochemical spatial disparities but also their temporal evolution.

In order to assign these results to the corresponding catchment areas for every ST, we first defined the catchment areas of each ST.

Here are the most striking results from the exploitation of existing geochemical data:

- The Haussmannian buildings, which are present for the most part in the city Centre, are the main source of zinc emissions. This element is found more abundant in the sediments of ST draining areas with a high density of historical buildings than others.
- Based on concentration ratios, PAHs mainly result from wood or coal combustion (Figure 1).
- The concentration of PAHs has been decreasing in ST sediments since 2000 and could reflect the increase of urban heating (water vapor) in Paris.
- PAH levels and types differ from one ST to another. These differences probably indicate local specificities in PAH production of each catchment area. Cross-referencing our data with other spatialized data related to potential PAH sources (road traffic, heating, etc.) should allow us to better understanding the factors that control their presence in sewer sediments.