

## Emerging pollutants and groundwater

### PURPOSE AND OBJECTIVES

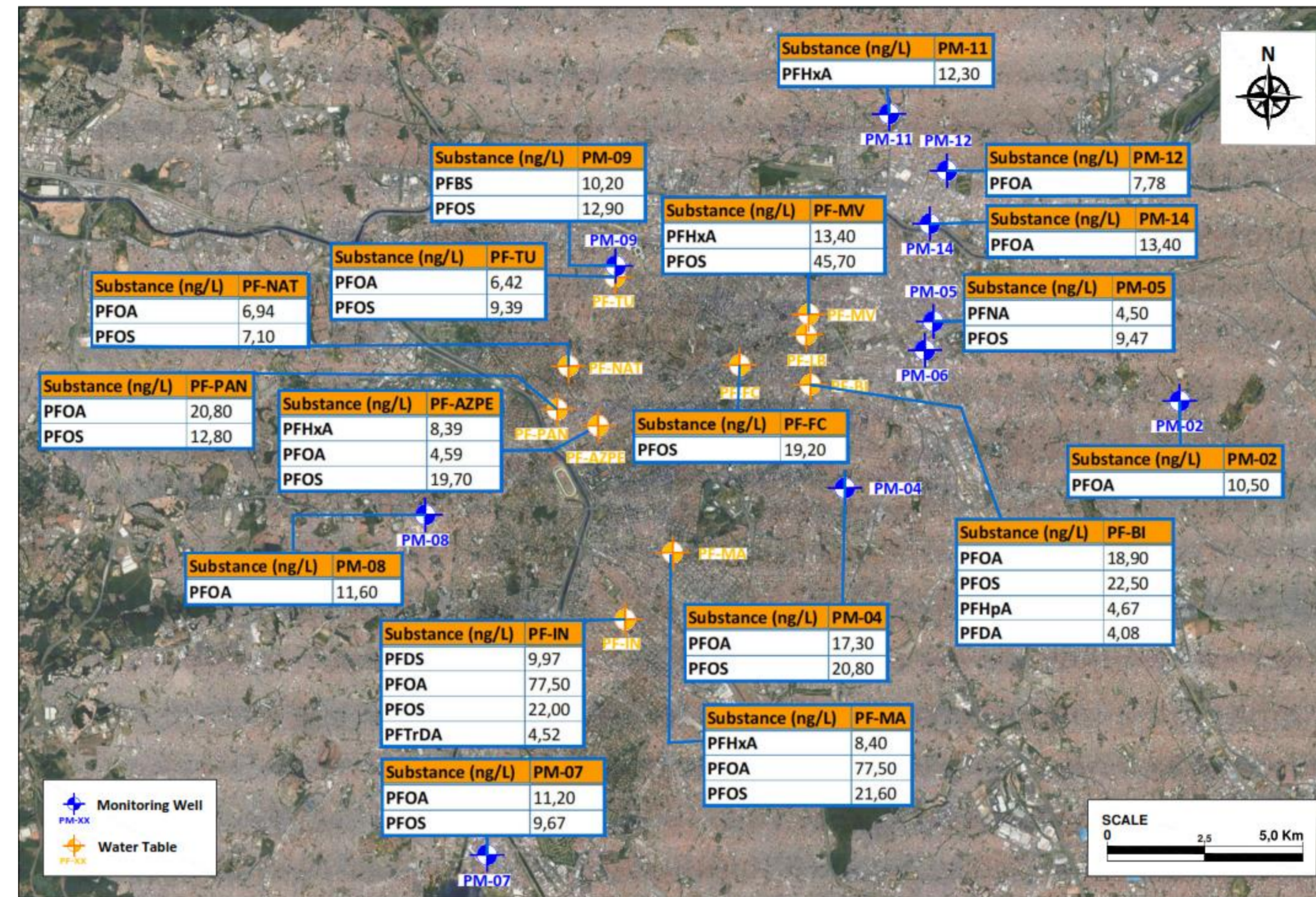
Due to the toxicity characteristics of the Emerging Pollutants (EP), the objective of this research was to carry out a substances characterization in groundwater, associated with contamination by domestic effluent from leaks in collecting system of São Paulo city/BR.

Based on the founded results, a groundwater quality management system could be discussed in order to mitigate these substances adverse effects caused to human health.

### METHODS

For EP analyses sample sites, a screening was done with the collection of groundwater samples in several localities of the city. Chemical analyses of Nitrate, Nitrite, Ammoniacal Nitrogen and Total Kjeldhal Nitrogen was done in order to characterize the presence of domestic effluents. Thus, the EP analysis were made in 10 monitoring wells, in addition to 10 building construction that dispose of groundwater in the street, due to the lowering of the water table. The chemical analyses performed were of Per- and Poly-Fluoroalkylated compounds (PFAS), Pharmaceuticals, Hormones, Pesticides, and Industrial Substances

### RESULTS



### CONCLUSIONS

- Almost the totality groundwater samples presented concentrations of PFAS, mainly PFOA and PFOS.
- The highest concentrations of PFAs were obtained in highest urban density places, confirming groundwater contamination by leaks of the old sewage collection system.
- For other emerging pollutants, the most samples showed pesticide concentrations levels.
- These results highlight the need to adopt public policies in order to prevent adverse effects on the population exposed to emerging pollutants.

Emerging Pollutants	Groundwater Samples
Caffeine	PM-05, PM-09, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-MA, PF-AZPE, PF-NAT, PF-PAN
Paracetamol	PM-05
Testosterone	PM-02
2,4-Dichlorophenoxyacetic acid	PM-02, PM-04, PM-06, PM-07, PM-09, PM-11, PM-12, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-TU, PF-IN, PF-MA, PF-AZPE, PF-NAT, PF-PAN
Ametrine	PM-11
Atrazine	PM-04, PM-05, PM-06, PM-07, PM-08, PM-09, PM-11, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-TU, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
2-Hydroxyatrazine	PM-06, PM-07, PM-08, PM-09, PM-11, PM-14, PF-LB, PF-MV, PF-FC, PF-MA, PF-AZPE, PF-PAN
Desethylatrazine	PM-14
Deisopropylatrazine	PM-14
Azoxystrobin	PM-02
Carbendazim	PM-02, PM-04, PM-05, PM-06, PM-07, PM-08, PM-09, PM-11, PM-12, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-TU, PF-MA, PZ-AZPE, PF-PAN
Diuron	PM-02, PM-05, PM-06, PM-07, PM-08, PM-09, PM-11, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-TU, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
3-(3,4-dichlorophenyl)-3-methylurea	PM-06, PM-07, PM-09, PM-11, PF-BI, PF-FC, PF-TU, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
Fipronil	PM-04, PM-05, PM-11, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
Fipronil sulfide	PM-04, PM-05, PM-11, PM-12, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
Fipronil sulfone	PM-04, PM-05, PM-06, PM-07, PM-08, PM-09, PM-11, PM-12, PM-14, PF-LB, PF-MV, PF-BI, PF-FC, PF-IN, PF-MA, PZ-AZPE, PF-NAT, PF-PAN
Hexazinone	PM-11
Imidacloprid	PM-06, PM-07, PM-09, PM-11, PF-MA, PF-AZPE, PF-NAT, PF-PAN
Tebuthiuron	PM-02, PM-04, PM-05, PM-06, PM-07, PM-08, PM-14, PF-BI, PF-TU, PF-MA, PF-AZPE, PF-PAN
Bisphenol A	PM-06, PM-07, PM-08, PM-09, PM-11, PM-14, PF-LB, PF-MV, PF-FC, PF-IN, PF-AZPE, PF-NAT, PF-PAN