



Emerging Pollutants: Protecting Water Quality for the Health of People and the Environment

Microplastics in urban soil and groundwater in the city
of Bauru, São Paulo, Brazil

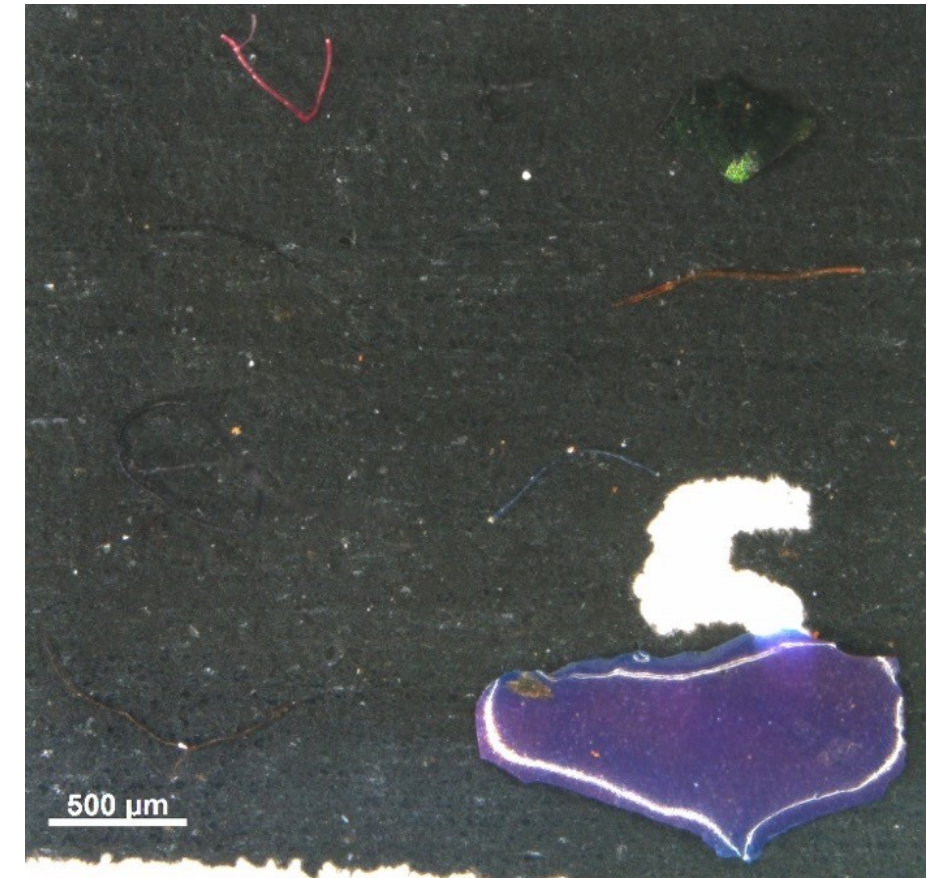
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(January 17th, 2023, 17:35 CET)



Microplastics (MPs)

- Synthetic polymers derived from petroleum
- Size: from 1 to 5000 μm
- Shapes: spheres, films, fragments, and fibers



Source: Authors, 2022.

Objectives

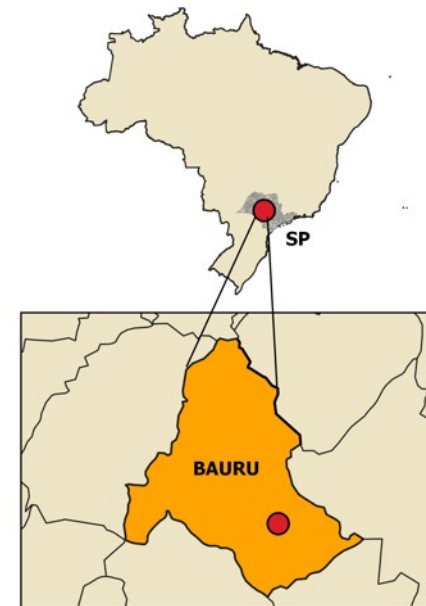
- Characterize the type of soil on the site
- Characterize the MPs found in the soil and groundwater samples
- Relate the occurrence of MPs with the physical characteristics of the environment
- Discuss the potencial sources of MPs in the study area



Source: Authors, 2022.



Site – Bauru River (Bauru City, State of São Paulo, Brazil)



- Groundwater: public supply, but without sewage treatment
- Historical contamination of groundwater by sewage

LEGEND

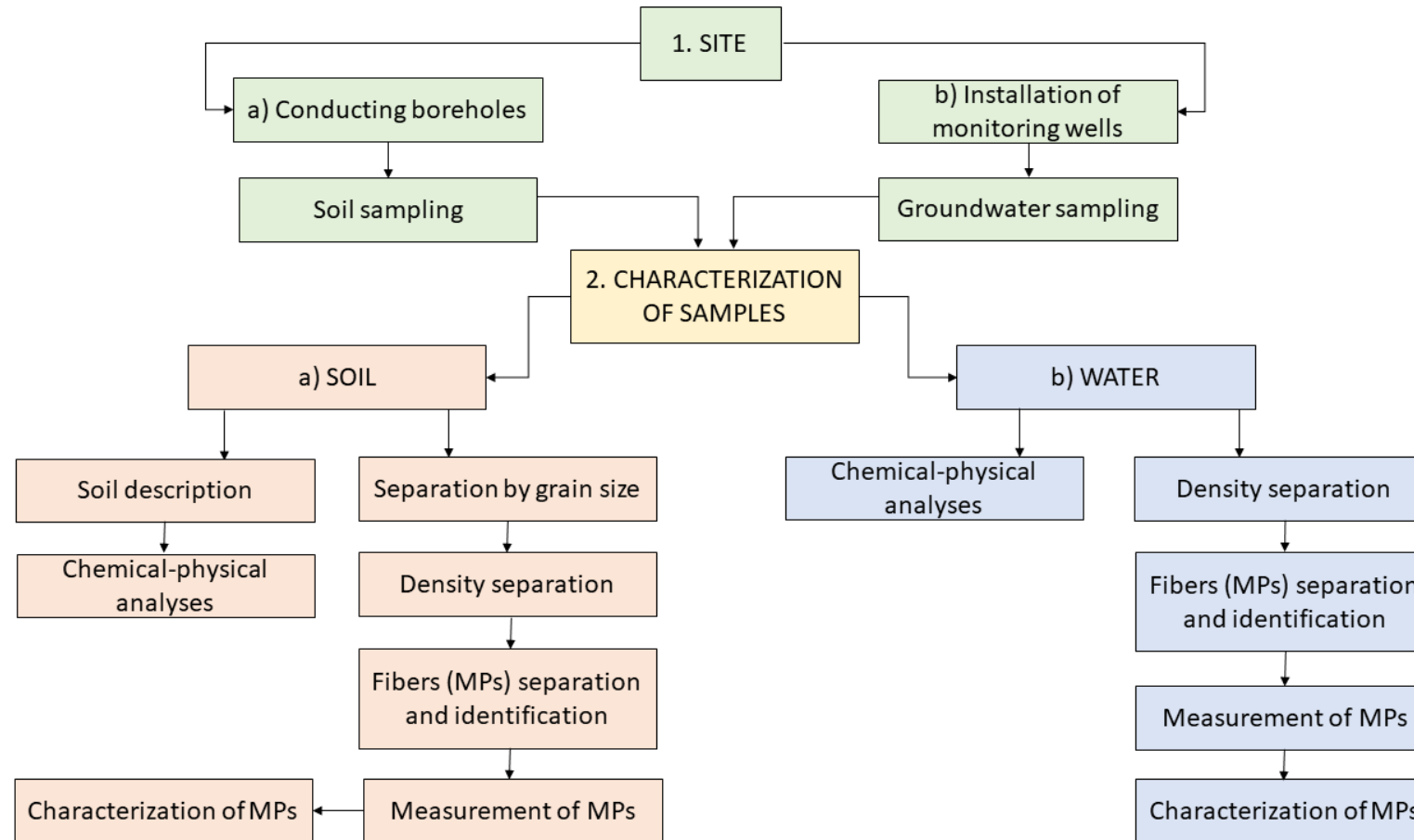
- Study area
- Main access roads
- Bauru river
- ➔ Surface water flow direction

Type of samples

- Borehole points
- Borehole points + monitoring wells

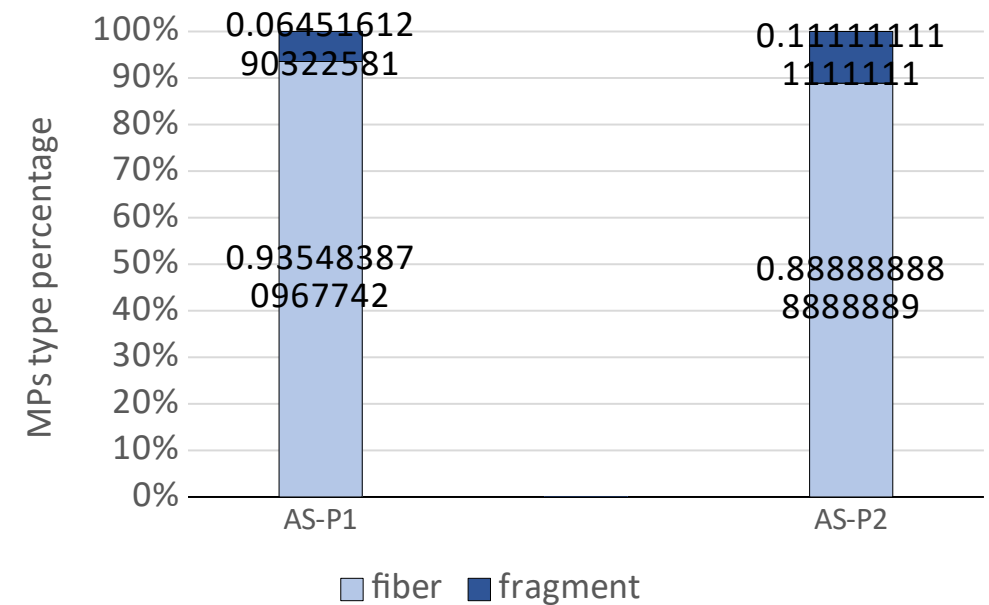
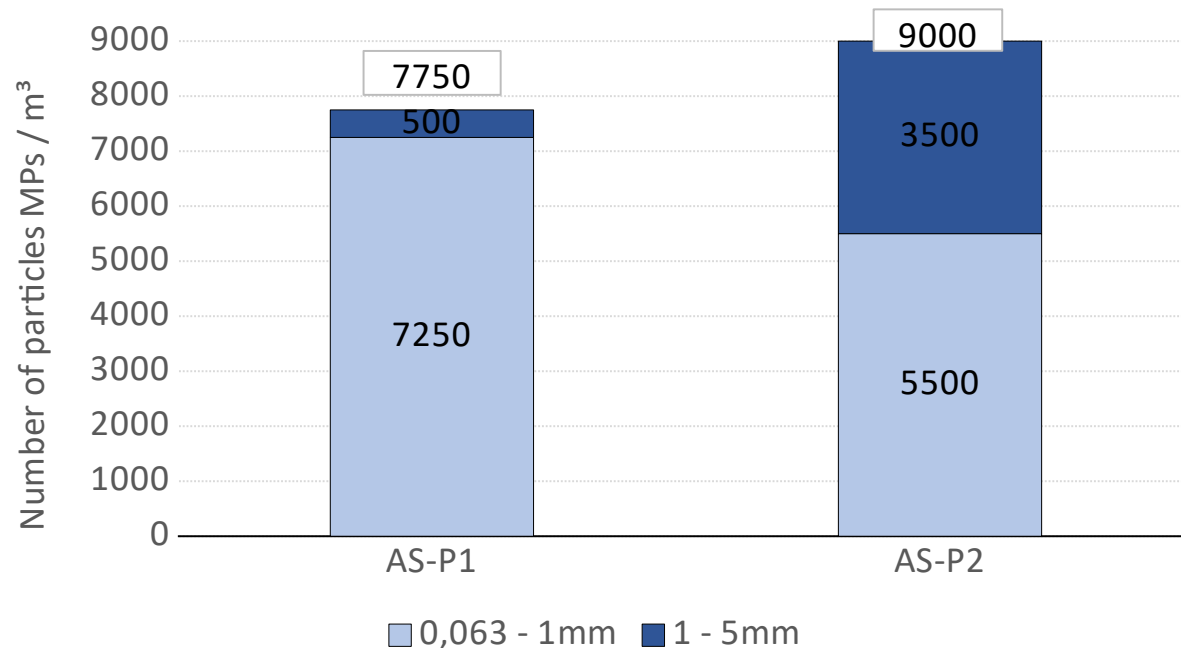


Methods



Results and Discussion - Microplastics in groundwater

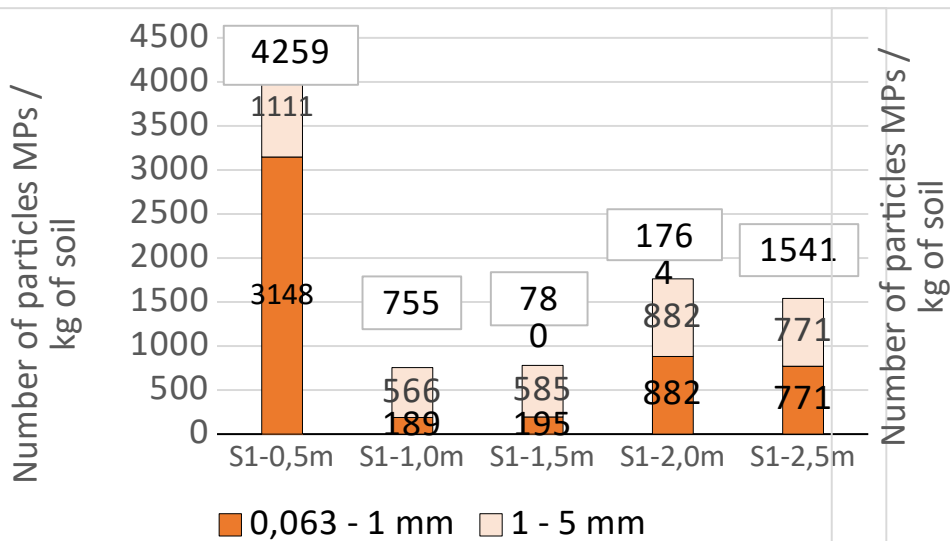
- Fibers from 0,063 to 1mm are dominant;
- Predominance of colored MPs.



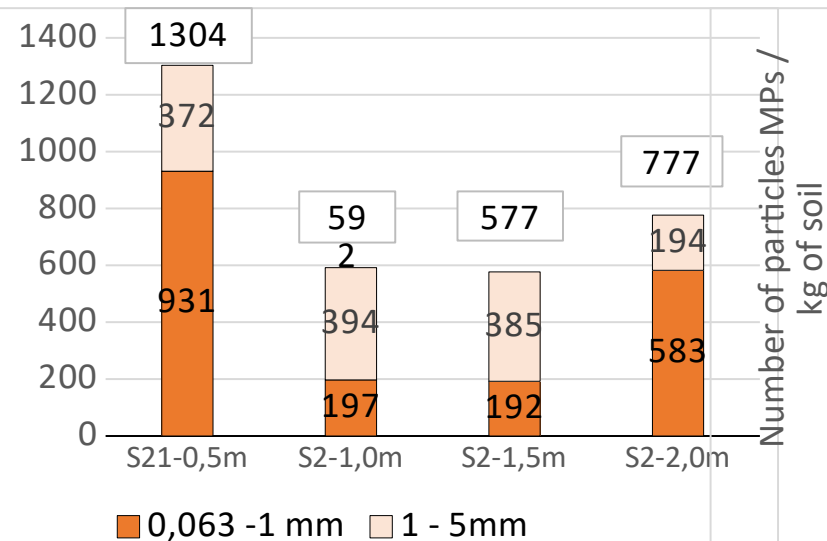
Results and Discussion - Microplastics in soil

- Great number of fibers at 0,5m depth;
- Fibers dominance from 0,063 a 1mm.

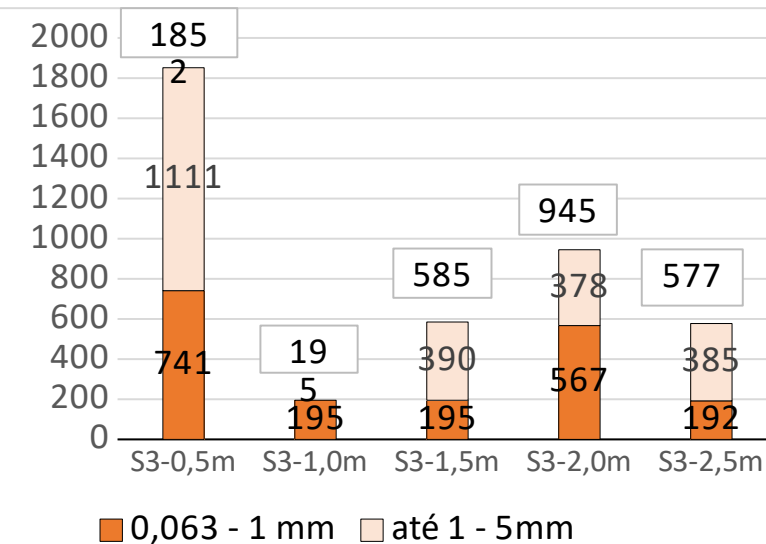
Borehole - S1



Borehole - S2



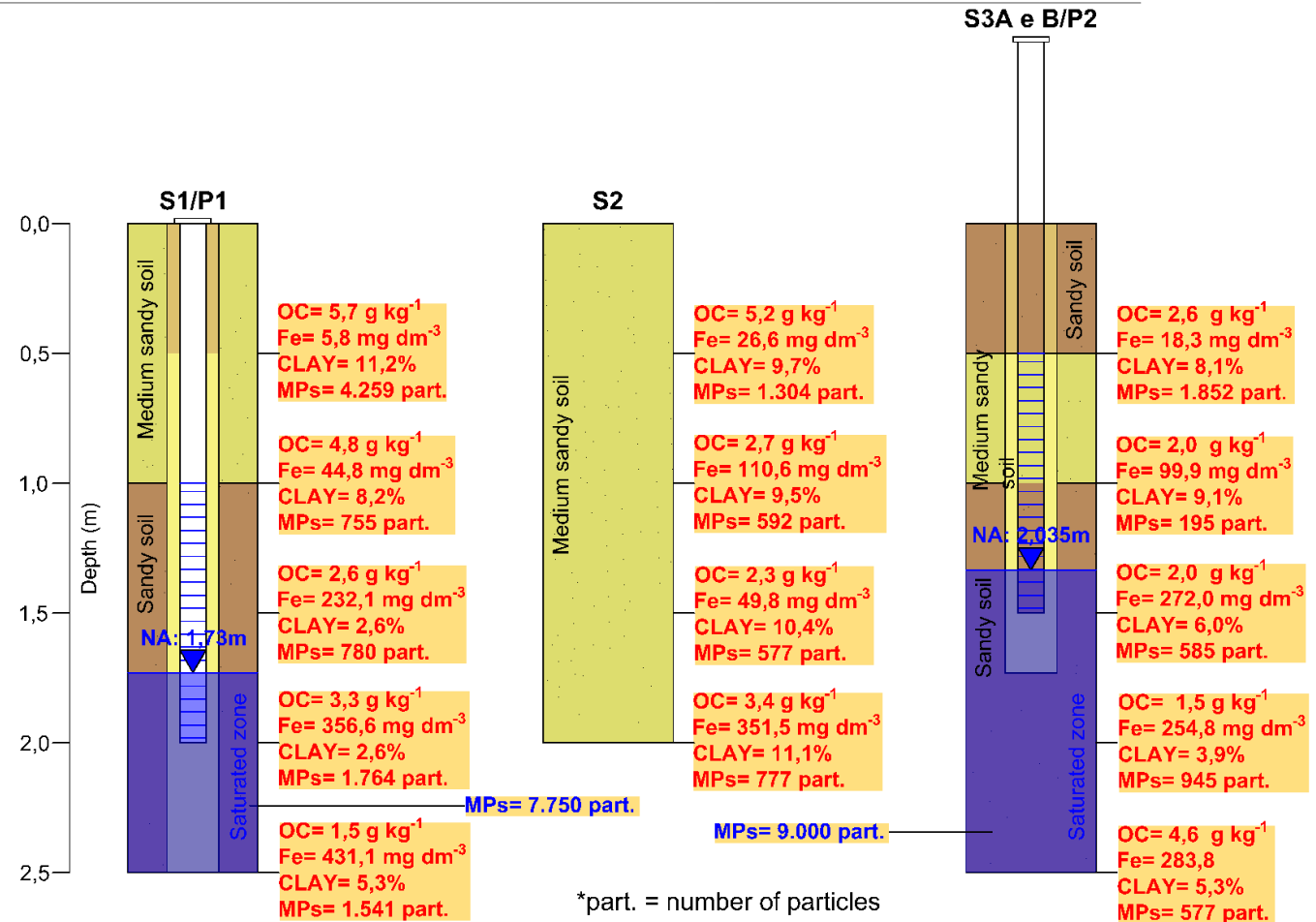
Borehole - S3



Results and discussion - Soil properties *versus* MPs

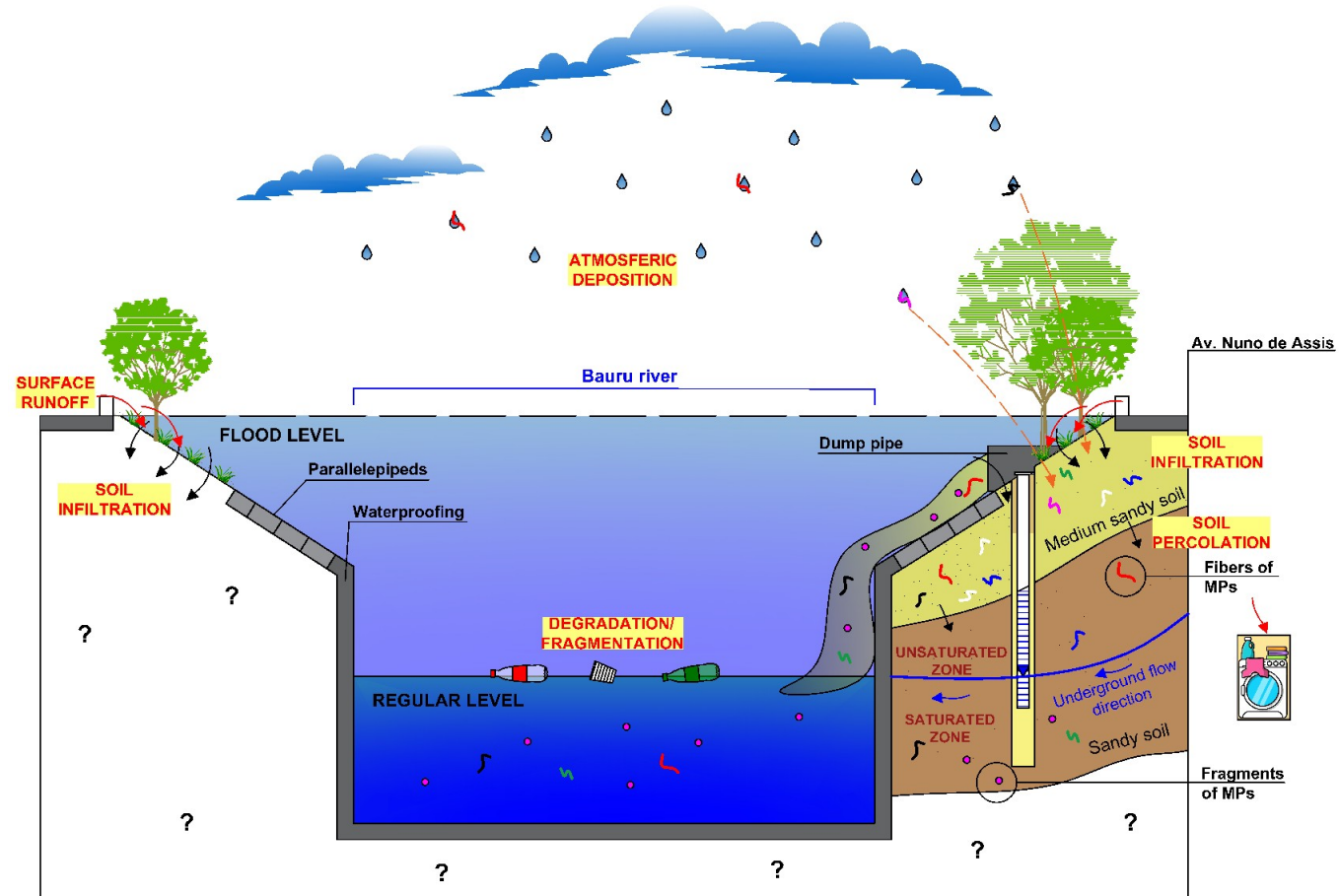
Higher fibers occurrence:

- 0,5 m depth: more clay and organic carbon;
- 2,0 – 2,5m depth: saturated zone, high iron content



Conclusions

- Microplastics were identified in soil and groundwater, predominantly in smaller sizes (0,063 to 1 mm)
 - Shapes:
 - Groundwater: fibers > fragments
 - Soil: only fibers
 - Color:
 - Saturated zone: Preponderance of colored fibers
 - Unsaturated zone: Preponderance of transparent fibers
- ↓
- Different sources of contamination for the unsaturated zone and saturated zone.



Source: Authors, 2022.

Acknowledgments

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