

Accumulation of Fine Sediments and Particle-bound Pollutants in a German Urbanised Stream

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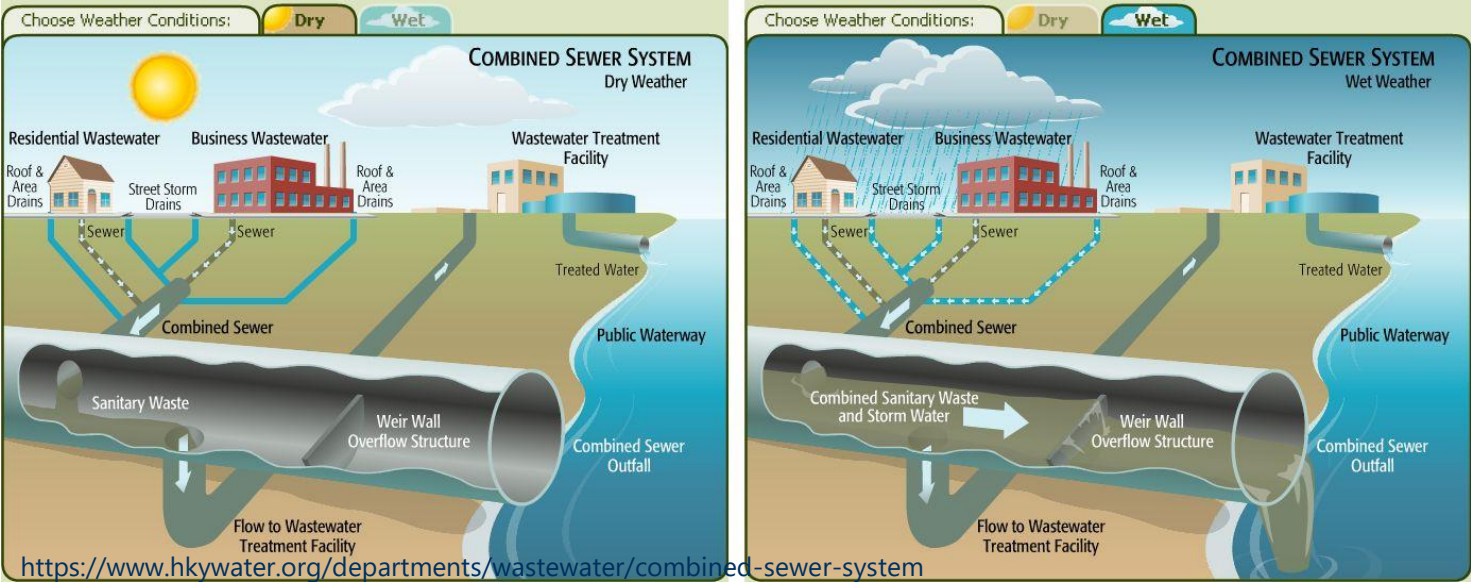
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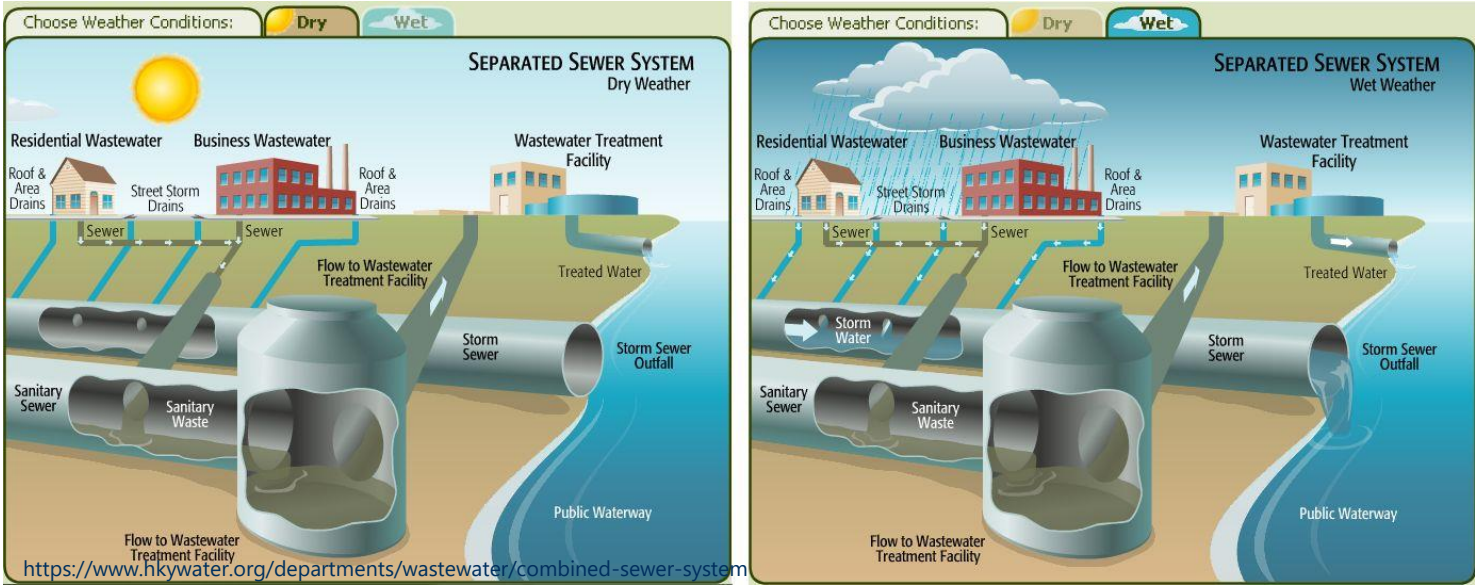
May 23th 2022

Background

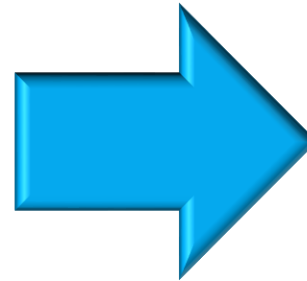


Separated sewer

Combined sewer



Background



Sewer sediments: sources and sinks of particulate matter, nutrients and pollutants

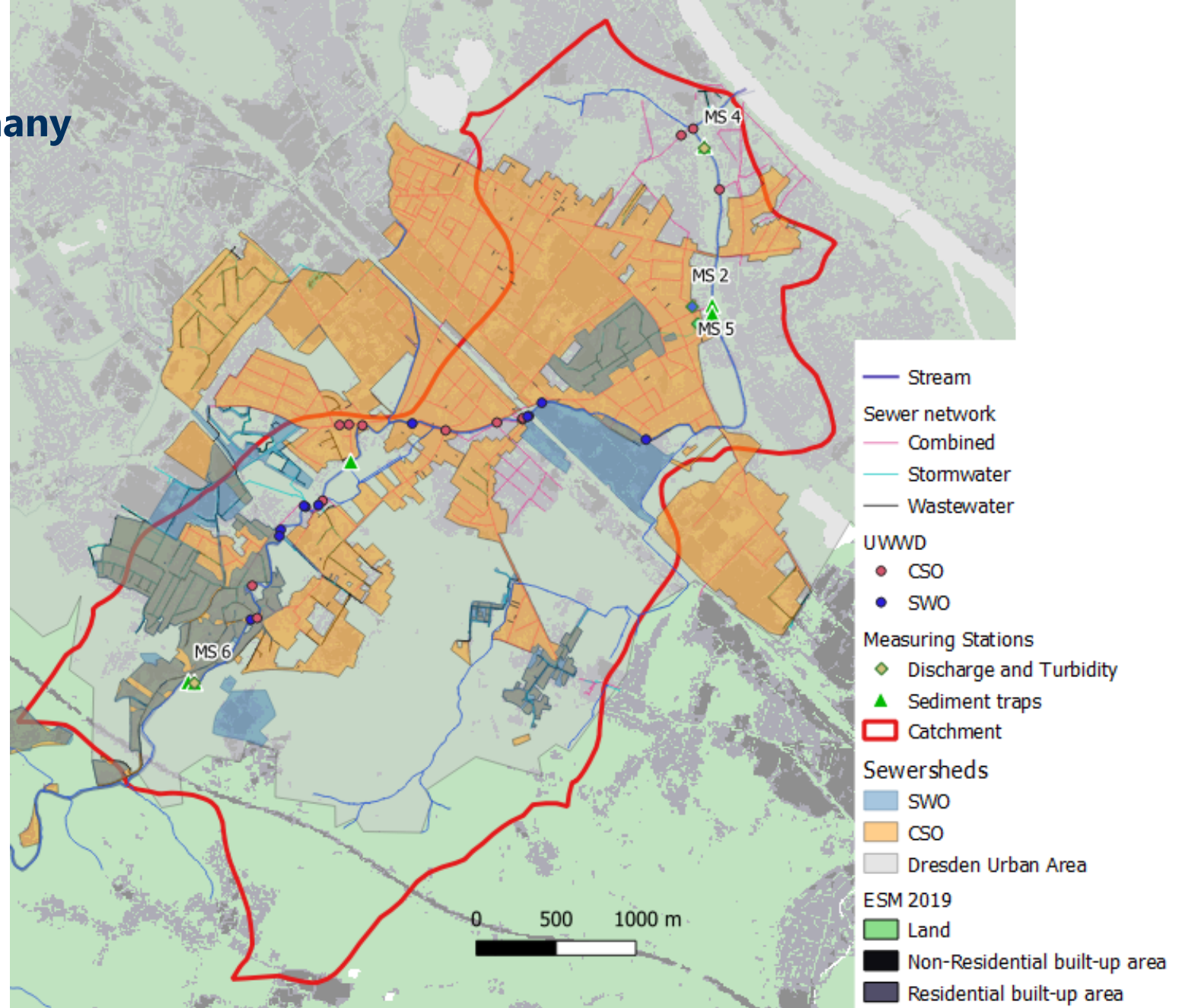
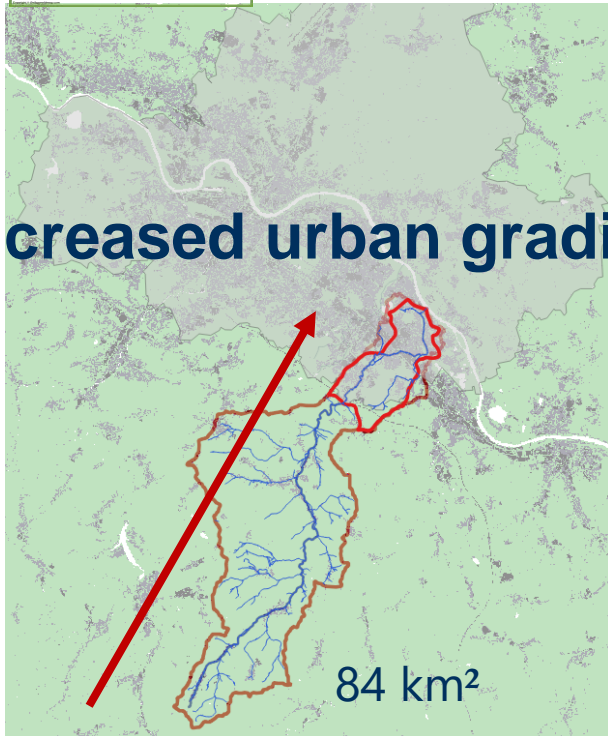
Affect permeability of river bed, groundwater/river water interactions and endanger stream ecosystems

Urban Observatory

Lockwitzbach catchment in Germany



Increased urban gradient!



Methods

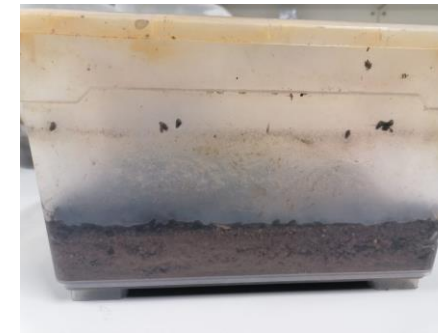
Intrusion of fine sediments in river bed

Impact of urban discharges on river bed

Possible hotspots

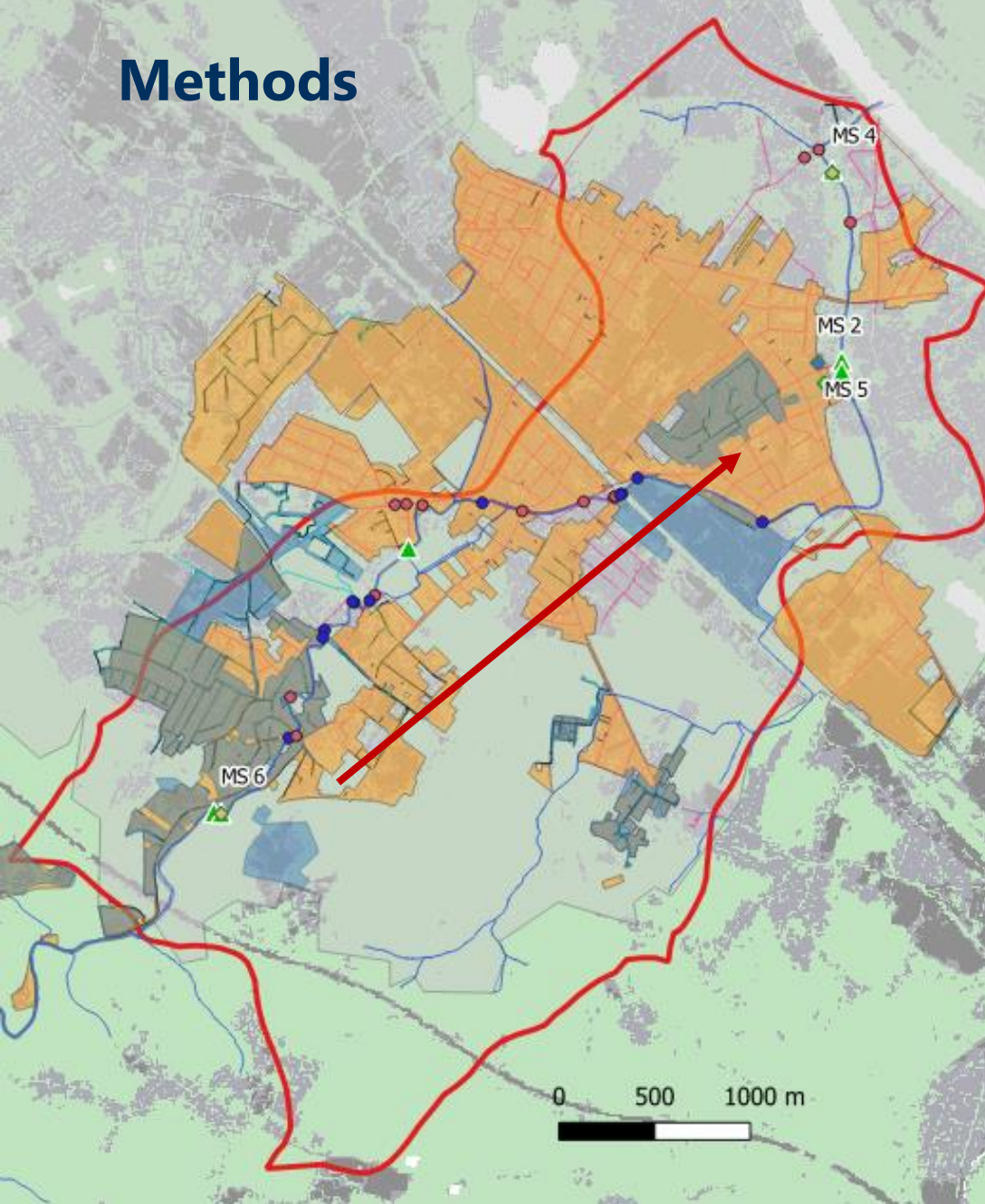
- Installed: 7 Sediment traps
- Collected: 75 sediment traps (after 9 rainfall events)
- 8 monitored CSO's events Jun - Aug 28th 2021

- Concentration of fine sediments and heavy metals



< 63 μg

Methods



14 CSOs/SWO

11 CSOs/SWO 1 CSO

1 CSO

1 CSO

MS6

MS5

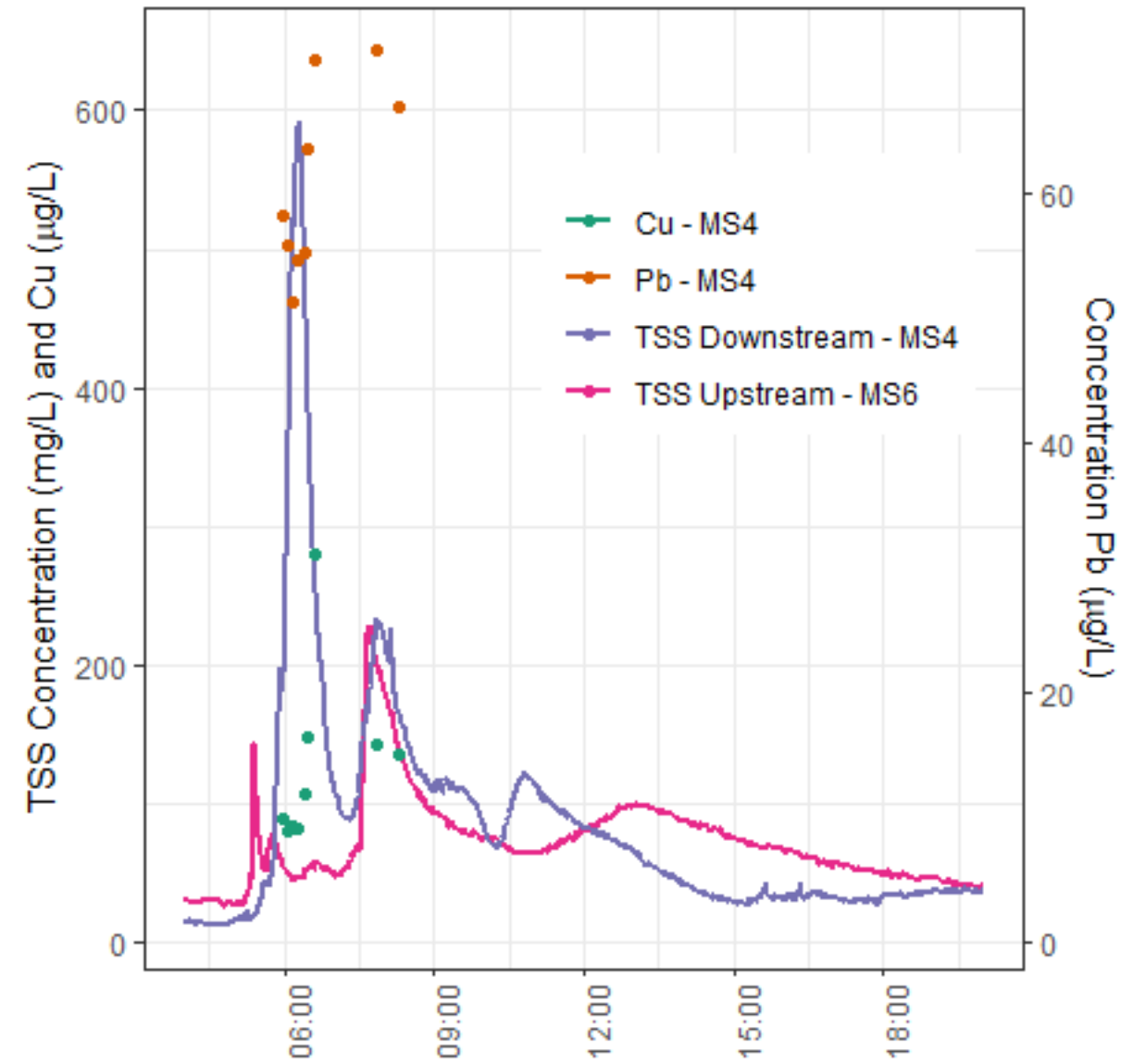
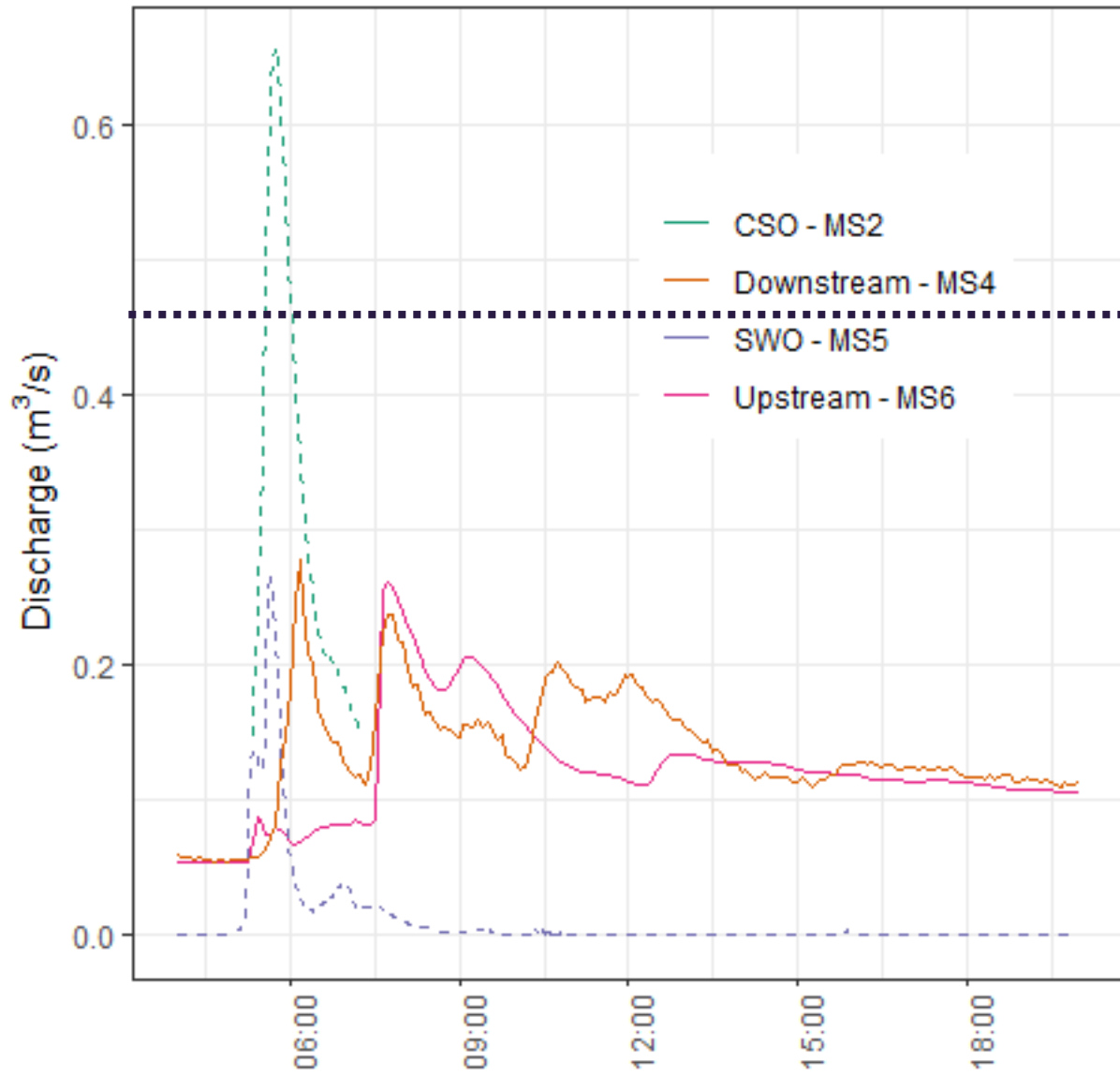
MS2

MS4



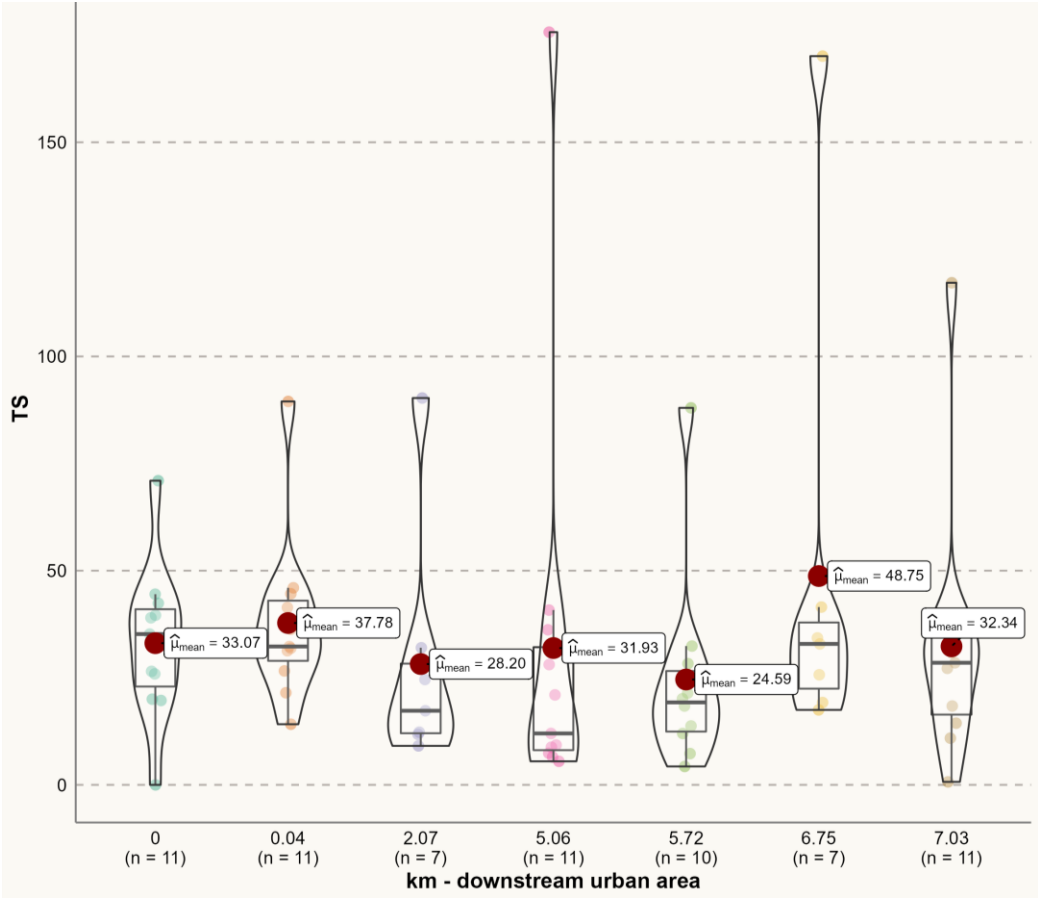
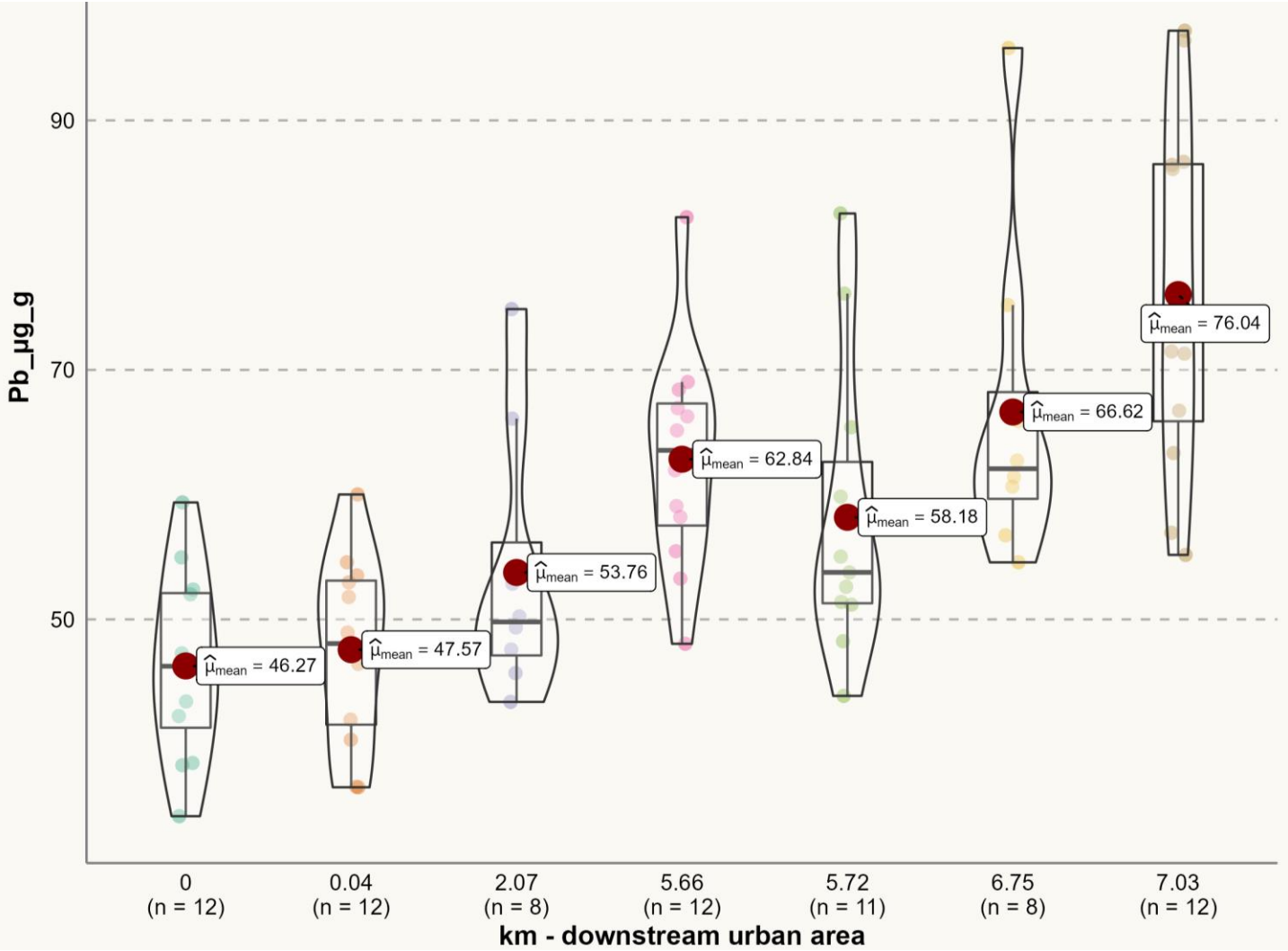
→
Increased urban gradient

9 Urban Catchments



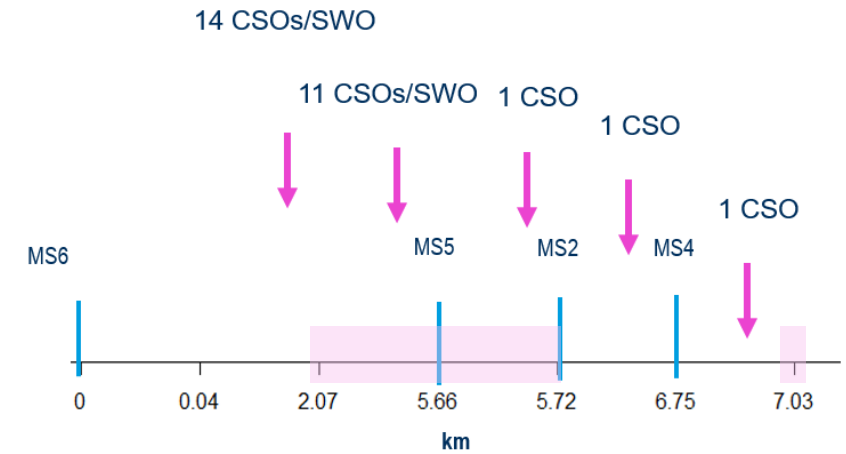
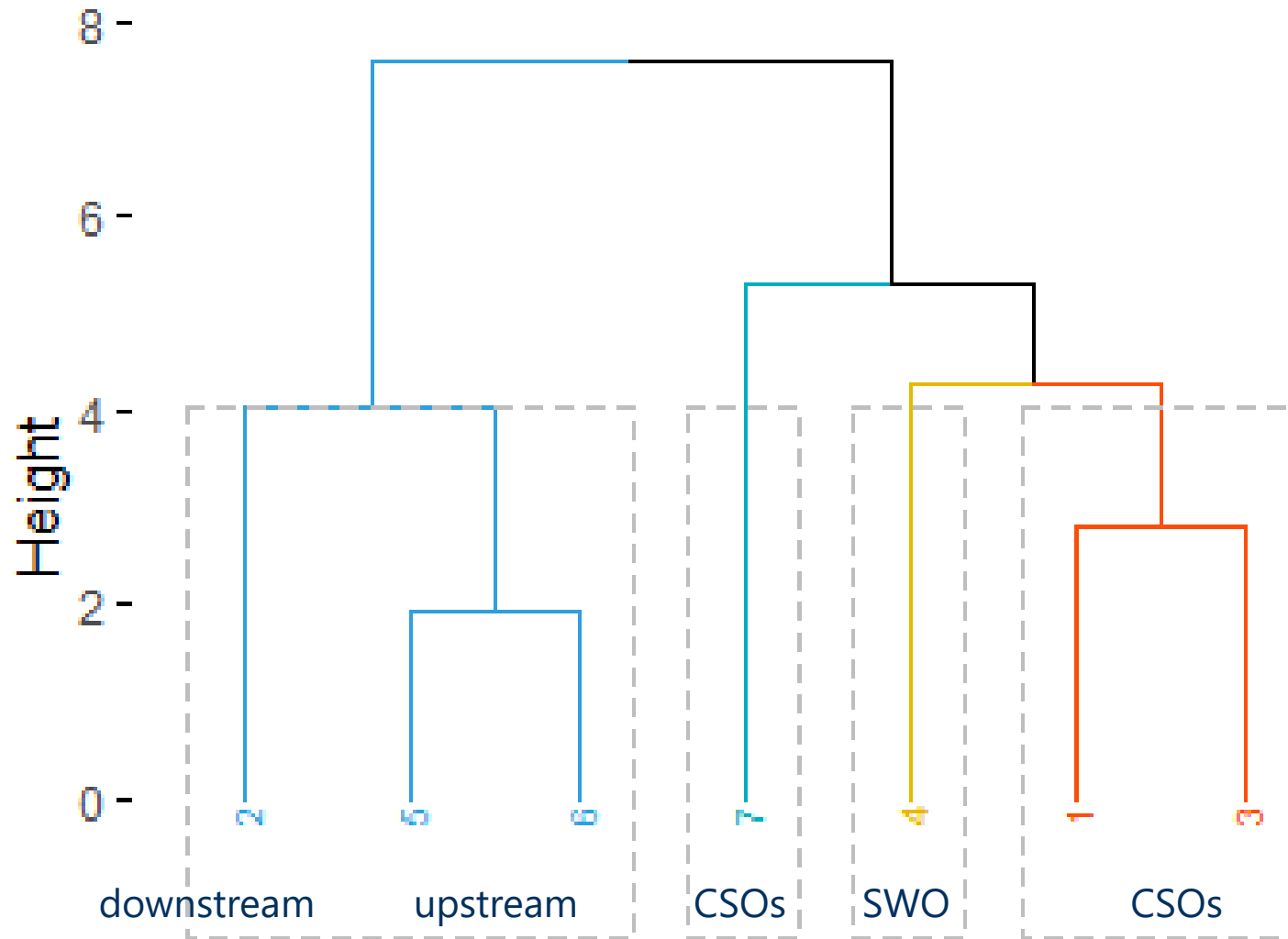
Metals concentration in fine sediments

(< 63 µg)



→ Increased urban gradient

Cluster Dendrogram



- 1 – MS2 (1 CSO)
- 2 – MS4 (1 CSO)
- 3 – MS4 down (1 CSO)
- 4 – MS5 (11 CSOs/SWO)
- 5 – MS6 (0 CSO)
- 6 – MS6 up (0 CSO)
- 7 – WMstr (14 CSOs/SWO)

Analysis done for scaled variables (mean 0 and sd 1): Al, B, Cd, Co, Cr, Cu, Pb, Sr, Zn, TS, oTS
Mean of each variable at a monitoring site

Final Remarks

Accumulation of contaminants towards the urban gradient

Attenuation capacity of the urban stream

Potential hotspots of intrusion of fine sediments

Potential locations to control fine sediments and PBPs

Thank you for your attention

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