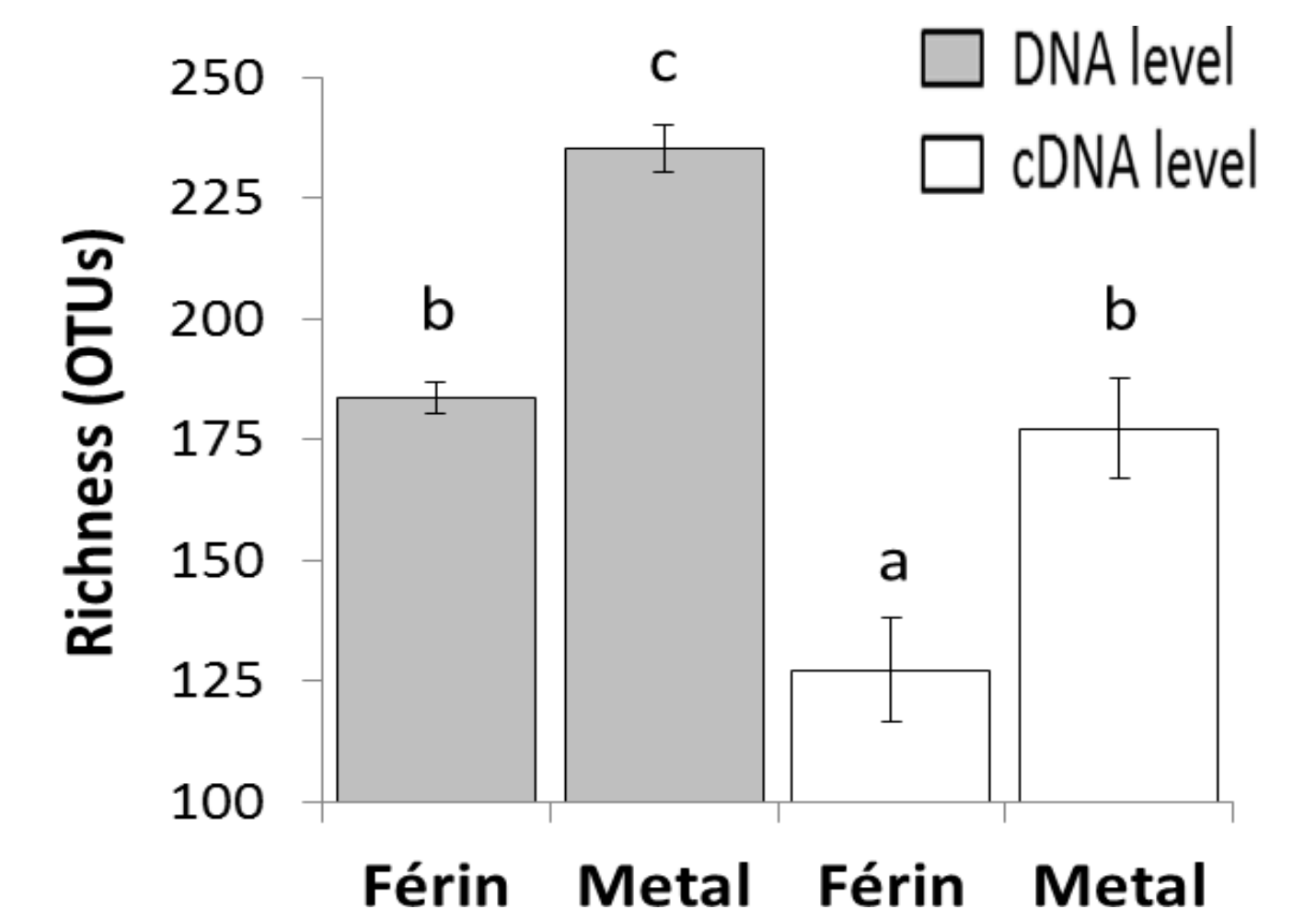
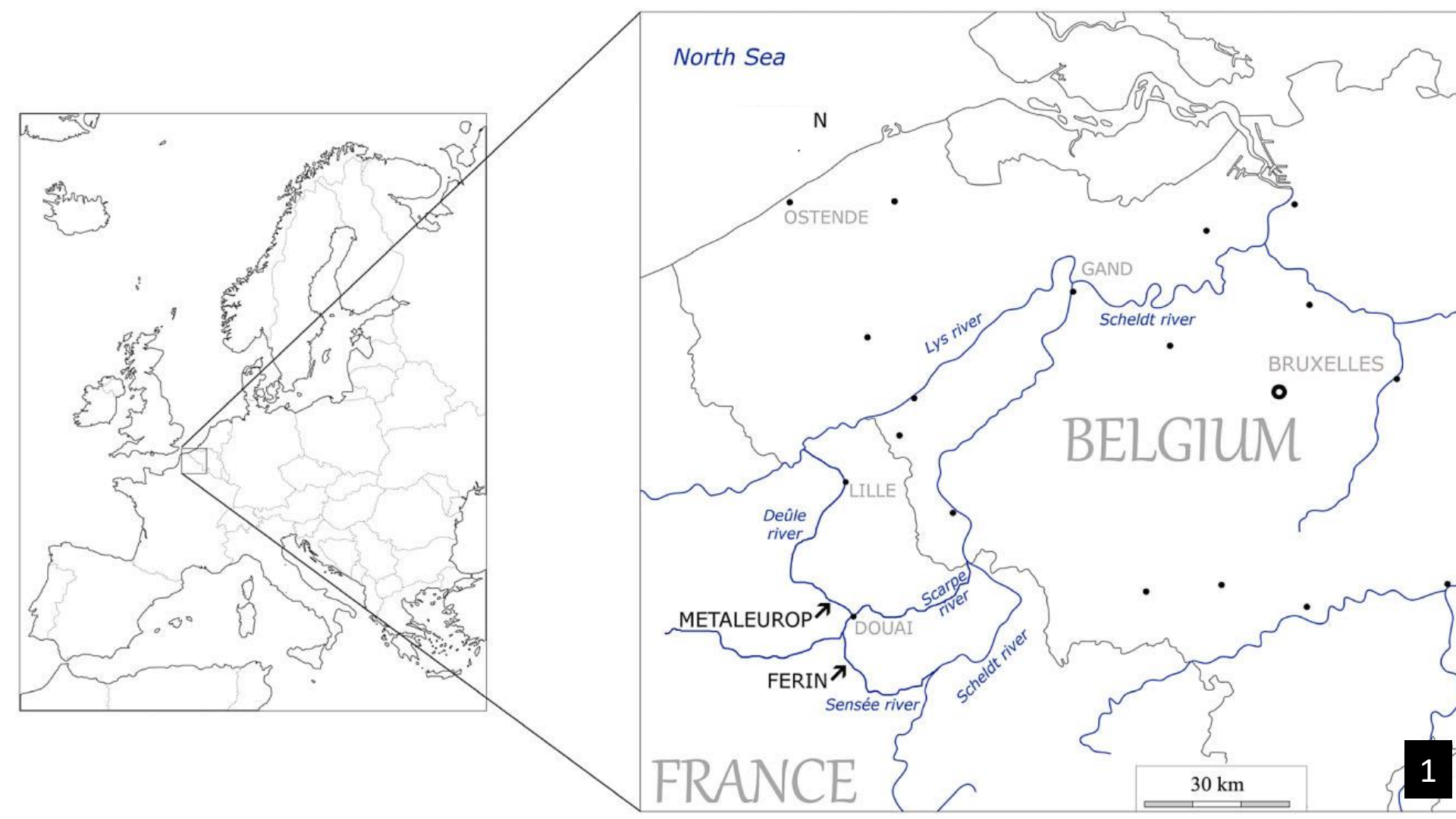
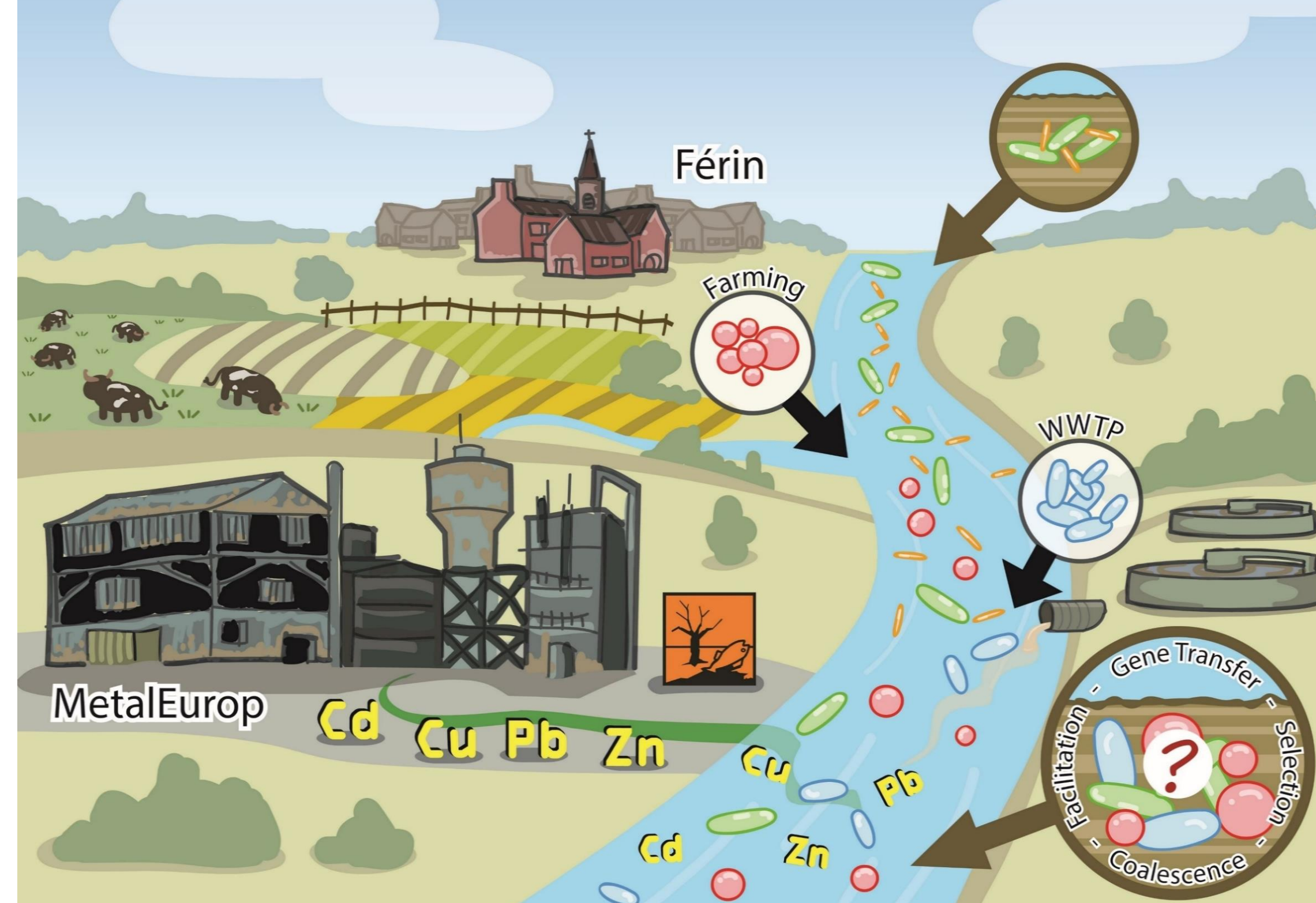


# Following the impact of metals on river sediments in microcosms: Metals as community manager

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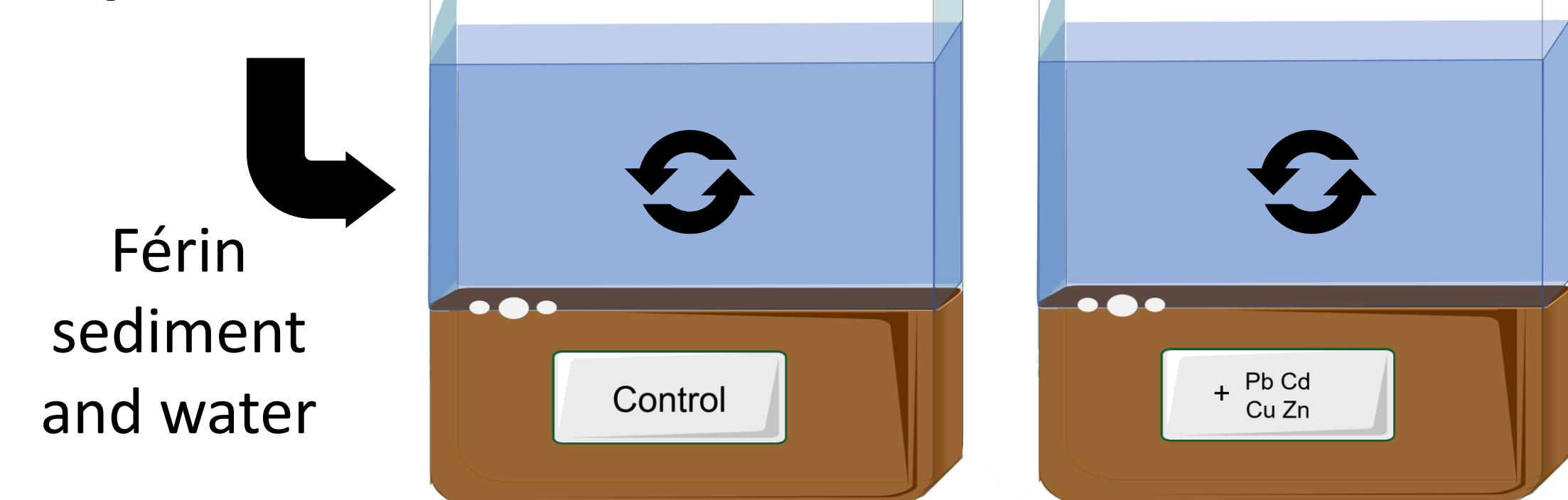
## Background



Jacquioud, S., Cyriaque, V., Riber, L., Al-soud, W.A., Gillan, D.C., Wattiez, R., and Sørensen, S.J. (2018) Long-term industrial metal contamination unexpectedly shaped diversity and activity response of sediment microbiome. *J. Hazard. Mater.* **344**: 299–307.

Microbial facilitation via “public-good” providing bacteria, Horizontal Gene Transfer (HGT) and community coalescence, overall resulting in an unexpected higher microbial diversity at the polluted site.

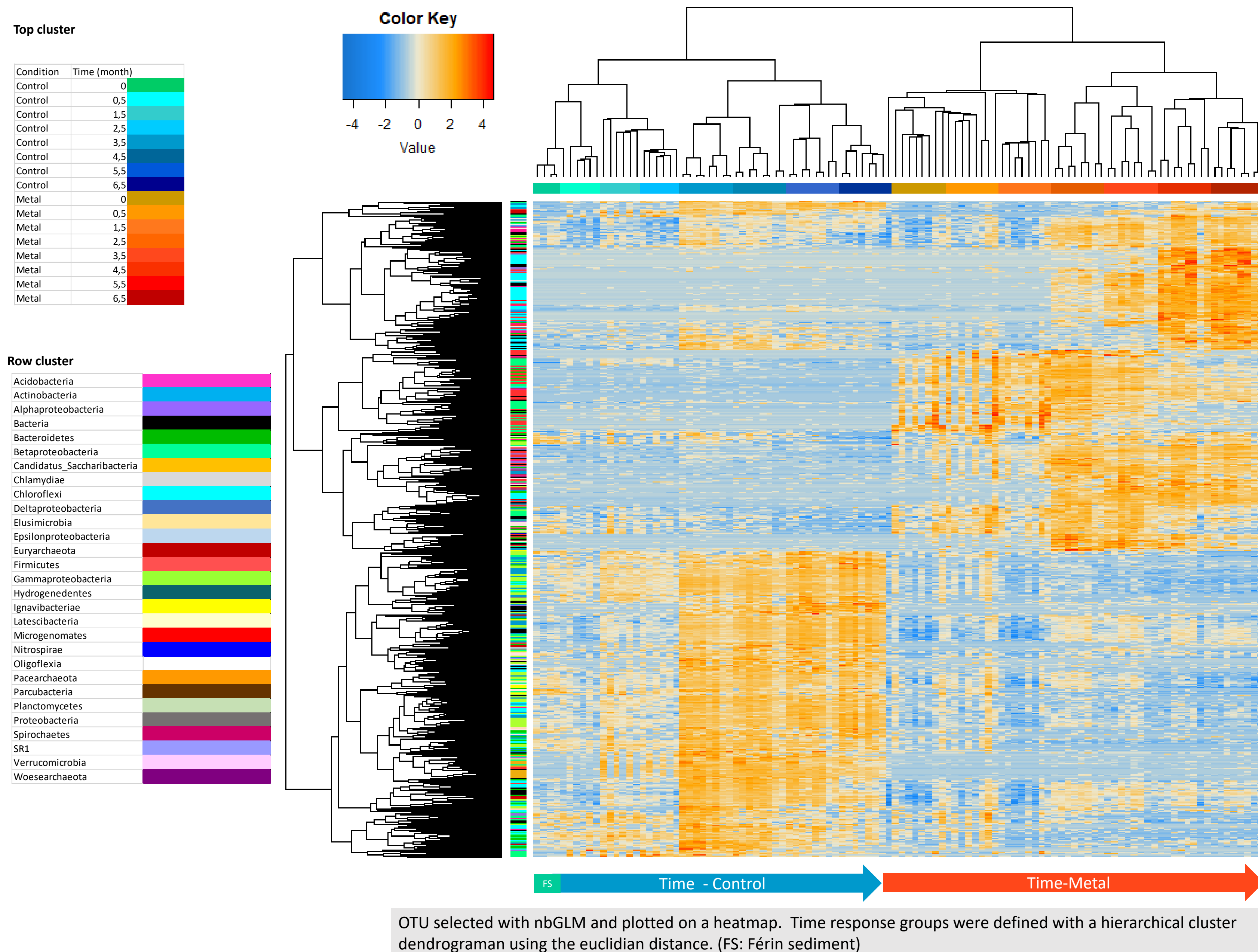
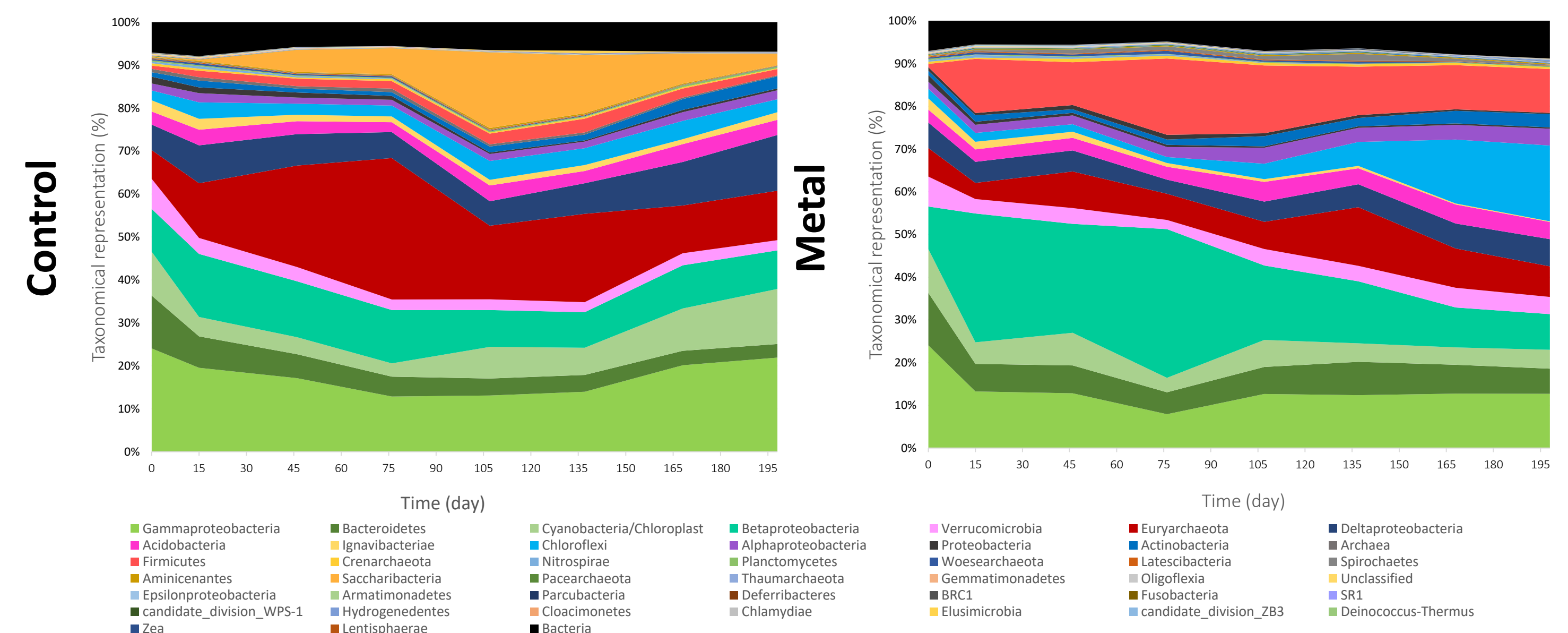
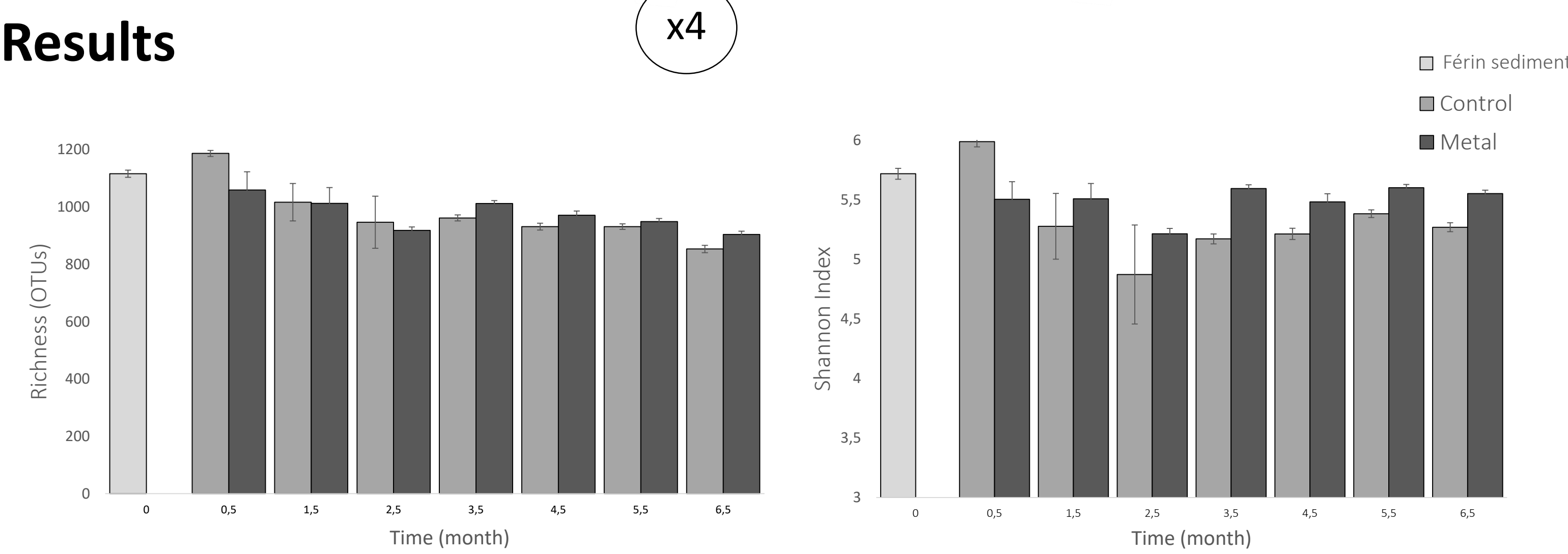
## Experiment



Férin sediments (50 mL) incubated at 23°C during 196 days with a daily fresh river water turnover and added with metals to reach MetalEurop sediment metal concentration in Cd, Cu, Pb, Zn<sup>1</sup> (36.8, 86.3, 902.2 and 2870 mg/kg respectively).

Microcosm monitoring using 16S rRNA gene sequencing (Illumina 2x250 bp).

## Results



## Conclusion

- The fresh water turnover stabilises the  $\alpha$ -diversity through time in both conditions supporting the community coalescence theory.
- Metals act as community managers allowing a higher richness and equitability in the community.
- The taxonomic profile is impacted by the microcosm condition and metals.
- During the 6 months of incubation with metals, dominant Gammaproteobacteria keep being challenged by strong niche competitors such as Firmicutes, Betaproteobacteria and Chloroflexi.
- Methanogens and sulfate reducing bacteria play a key role in the succession of taxonomic profiles
- Metals select for « public good » providing bacteria such as *Zooglea*, *Clostridium*, *Rhodobacteraceae*, *Aquabacterium* or *Novosphingobium*.

## References

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- Jacquioud, S., Cyriaque, V., Riber, L., Al-soud, W.A., Gillan, D.C., Wattiez, R., and Sørensen, S.J. (2018) Long-term industrial metal contamination unexpectedly shaped diversity and activity response of sediment microbiome. *J. Hazard. Mater.* **344**: 299–307.

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