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## How to evaluate the effectiveness of a hydromorphological restoration action? Feedback after 13 years of monitoring on the Marolles river

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### ► To cite this version:

Virginie Archambault, Laetitia Boutet-Berry, M. Rolan-Meynard, Michel Bramard, Anne Vivier.  
How to evaluate the effectiveness of a hydromorphological restoration action? Feedback after 13 years  
of monitoring on the Marolles river. *IsRivers*, Jul 2022, Lyon, France. hal-04561102

**HAL Id: hal-04561102**

**<https://hal.inrae.fr/hal-04561102>**

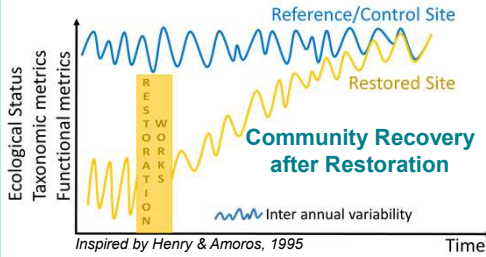
Submitted on 26 Apr 2024

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# How to evaluate the effectiveness of a hydromorphological restoration action? Feedback after 13 years of monitoring on the Marolles river

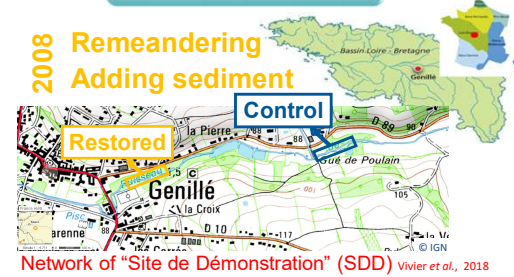
## Hypothesis



## Objective

- Evaluate the spatiotemporal evolution of macrobenthic communities
- Define the best taxonomic or functional metrics to highlight the recovery

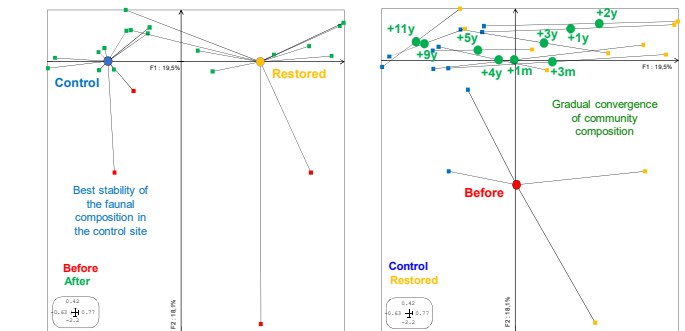
## Study Area



## Methods

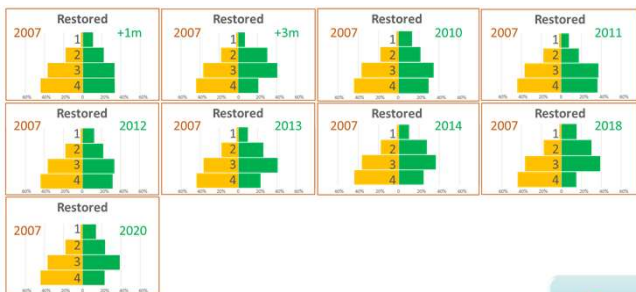
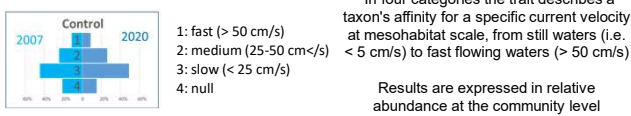
- BACI (Before-After-Control-Impact) monitoring (Rolan-Meynard *et al.*, 2019)
- I<sub>2</sub>M<sub>2</sub> field sampling protocol (NF T 90-333)
- Composition, structure and functional metrics calculation
- Traits profile calculation (Tachet *et al.*, 2000)
- I<sub>2</sub>M<sub>2</sub>: MultiMetric Invertebrate Index calculation (Mondy *et al.*, 2000)
- Multivariate analysis (FCA)

## Results

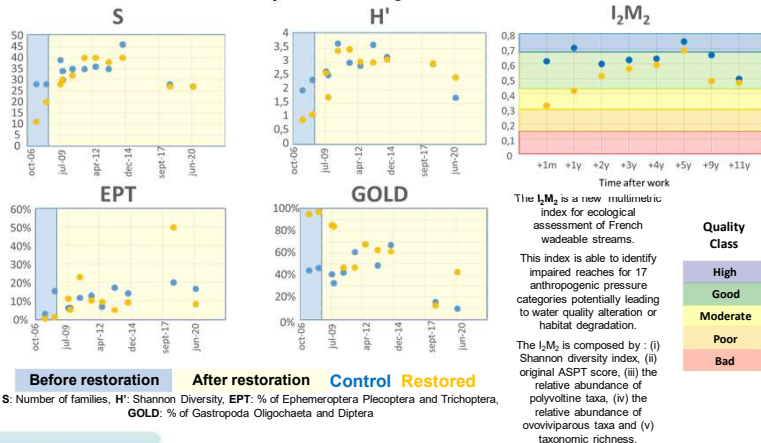


Results of the factorial correspondence analysis (FCA) on invertebrate communities. Distribution of status types (Control/Restored)/sampling dates (Before/After) (solid circles) and sampling sites (solid squares) on the first factorial plane. Status types/Sampling dates are located at the weighted average of the corresponding sampling sites. Lines link sites to their status type/sampling dates. +1m=+1month after restoration work, +3m=+3months, +1y=+1year, +2y=+2years, +3y=+3years, +4y=+4years, +5y=+5years, +9y=+9years, +11y=+11years after restoration work

Example of an ecological profile of the macrobenthic community: **Current Velocity\***



Example of biological metrics:



## Conclusion

- The further one goes from the date of the work, the more the communities of the two sites look like each other, and the more sensitive taxa are found at the restored site, which follows the expected pattern
- The most interesting metrics to study seem to be: Richness, Diversity, I<sub>2</sub>M<sub>2</sub>, %EPT, %GOLD, Current Velocity (Preferendum)

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