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Multiple tools for antibiotics and AMR characterisation in aquatic ecosystems

a 2-years monitoring study

Chloé Bonnineau¹, Agnès Bouchez², Anaïs Charton¹, Teofana Chonova², Christophe Dagot³, Marion Devers⁴, Margaux Gaschet³, Jérôme Labanowski⁵, Emilie Lyautey², Fabrice Martin-Laurent⁴, Leslie Mondamert⁵, Stéphane Pesce¹

¹UR **RiverLy**, INRAE

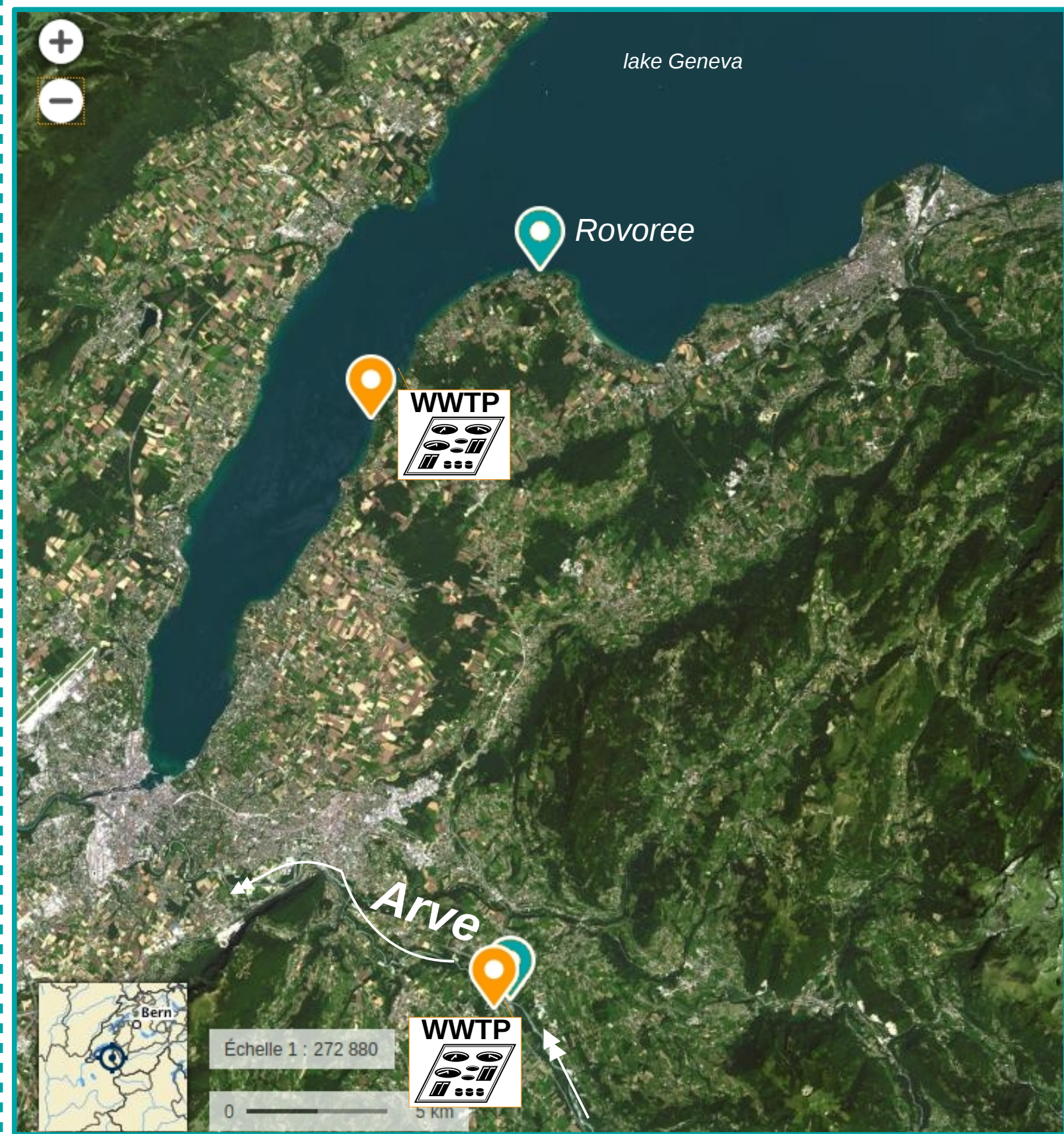
²UMR **CARTEL**, INRAE Thonon - Université Savoie Mont Blanc

³UMR **INSERM** 1092, Université de Limoges

⁴UMR **Agroécologie** INRAE

⁵UMR 7285, Université de Poitiers

Where ?

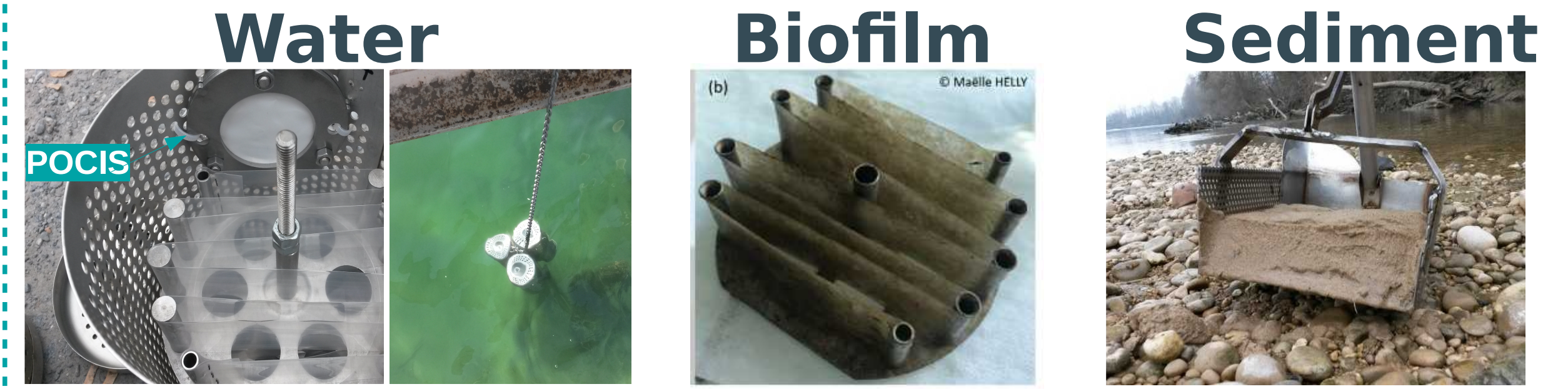


Why ?

Investigate the fate and temporal dynamics of pharmaceutical residues in aquatic ecosystems

AMR & antibiotics: is community microbial tolerance to antibiotics correlated with exposure ?

How ?



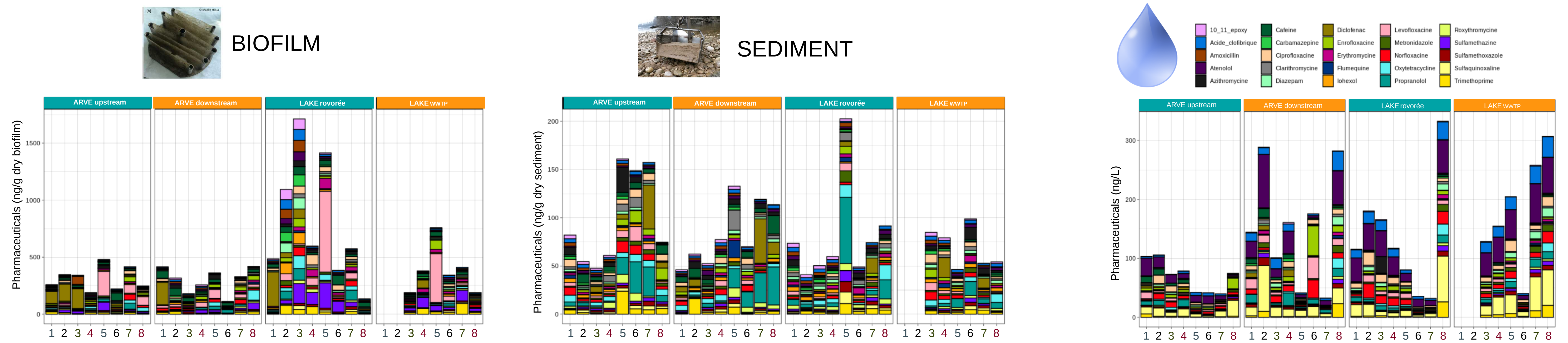
8 field samplings during 2 years :

- 1 - November 2018
- 2 - February 2019
- 3 - May 2019
- 4 - September 2019
- 5 - November 2019
- 6 - March 2020
- 7 - June 2020
- 8 - September 2020

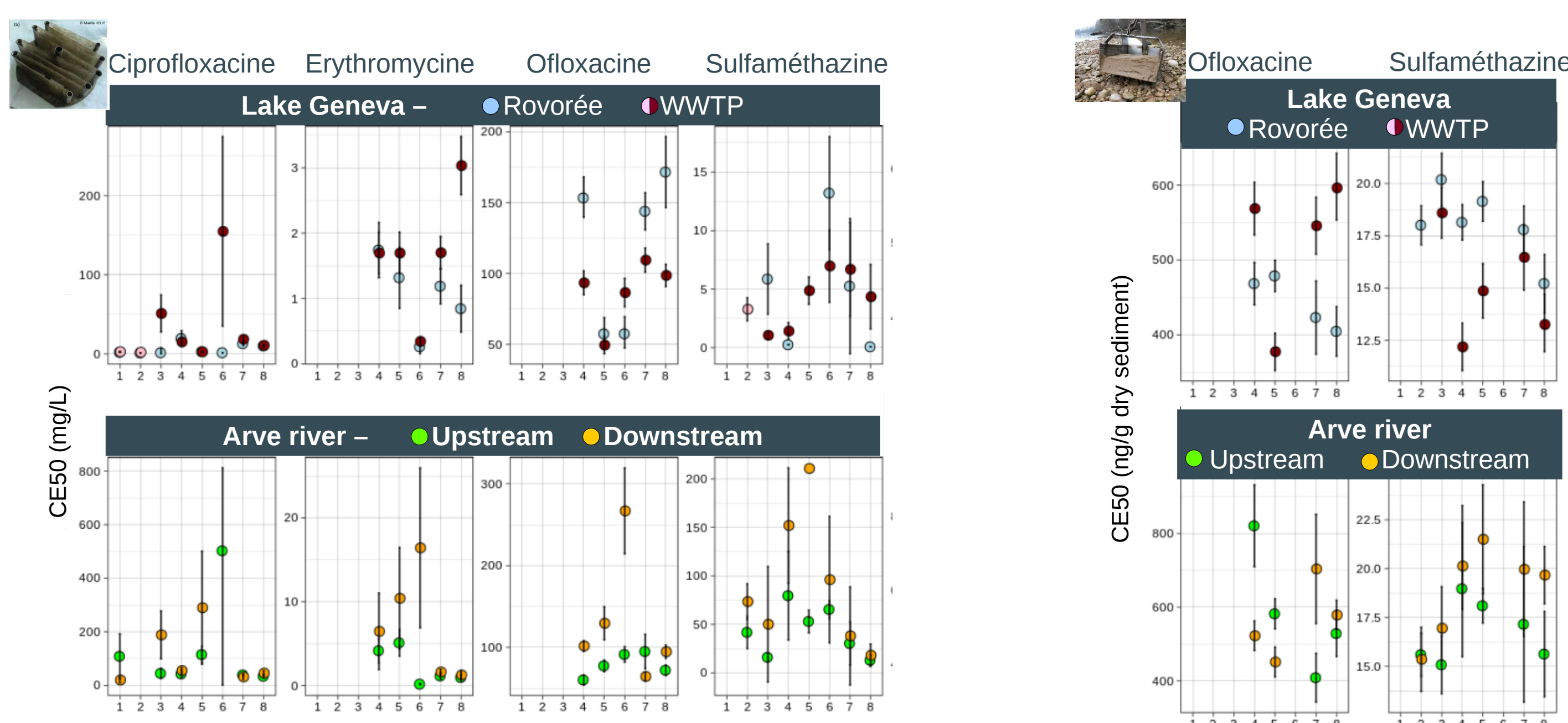
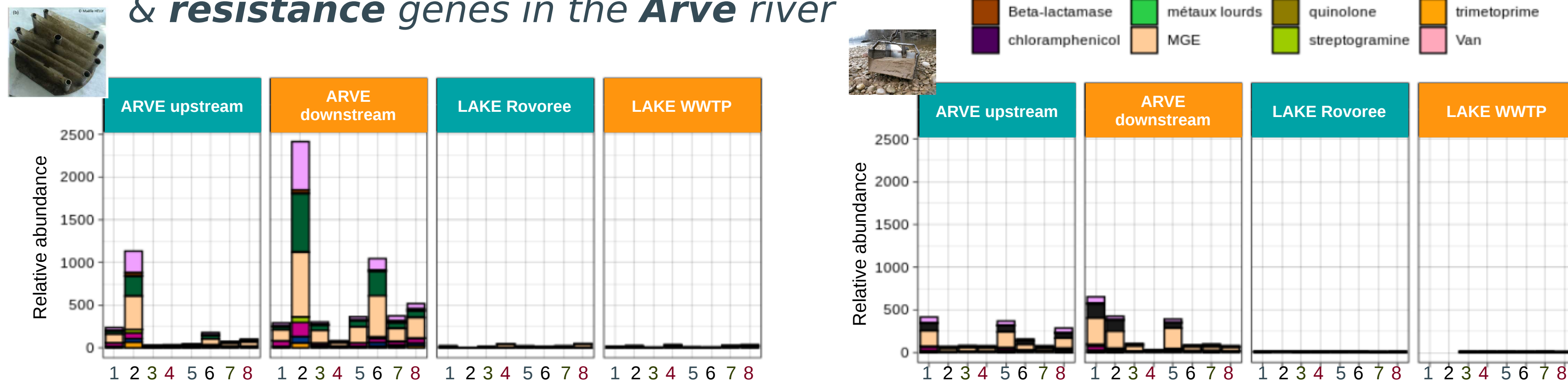
- Determination & quantification of pharmaceutical residues
- Antimicrobial resistance (AMR) characterisation in microbial communities
- Microbial potential for sulfonamides biodegradation



What ? Distribution of pharmaceutical residues was specific of each compartment of the aquatic ecosystems studied



High relative abundance of integrons & resistance genes in the Arve river



Microbial tolerance to antibiotics is variable over time.

Arve river : microbial tolerance to antibiotics is globally higher downstream WWTP

And so what ? Microbial exposure to pharmaceuticals is different in surface water, biofilm or sediment

Biofilm is a hotspot of pharmaceutical bioaccumulation

No clear linear correlations between pharmaceutical concentrations in the environment and antimicrobial resistance

And next ? Investigate the influence of other factors such as temperature, water flow, bacteria from WWTP on AMR dissemination & persistence in the aquatic environment

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