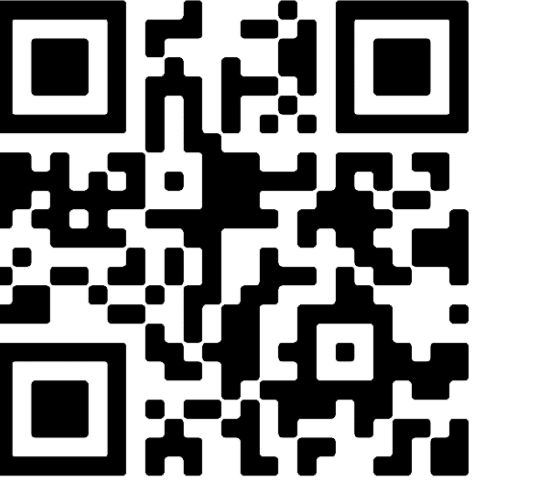


Biodiversity as barrier against ARGs diffusion: a first look into the ANTIVERSA project



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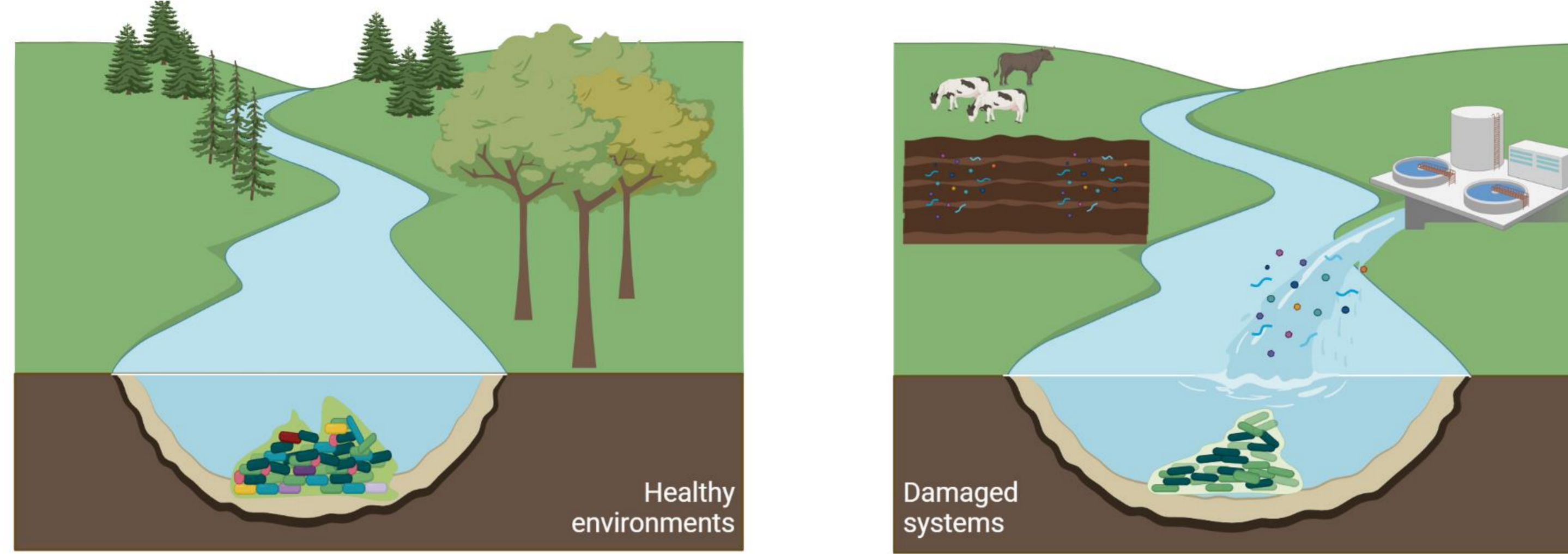
BACKGROUND

The ability of microorganisms to develop antimicrobial resistance (AMR) is increasing. Many surface waters and soils are occasionally or chronically polluted by antimicrobial compounds.

Antibiotic resistant bacteria (ARB) and antibiotic resistant genes (ARG) spread into the soil and freshwater environment, from manure, aquaculture and livestock facilities as well as from treated and untreated urban, hospital and industrial wastewater.

PROJECT GOAL

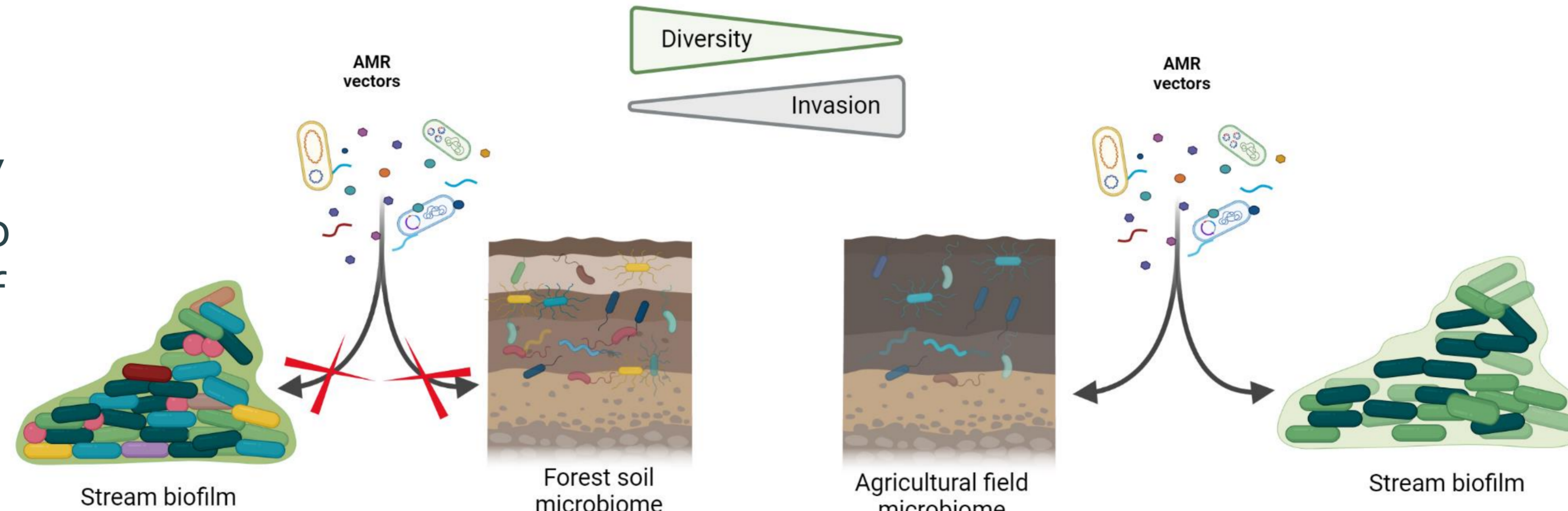
To investigate whether aquatic and terrestrial microbial communities with higher diversity are less susceptible to invasion by resistant bacteria and resistance gene transfer



? Does the nature and diversity of the AMR vectors (ARB vs. free DNA vs. viral fraction) interfere with the barrier effect?

? Which conditions promote a successful microbial AMR-invasion or AMR spread by horizontal gene transfer?

? Can high biological diversity act as an ecological barrier to the spread and persistence of ARB and ARGs?



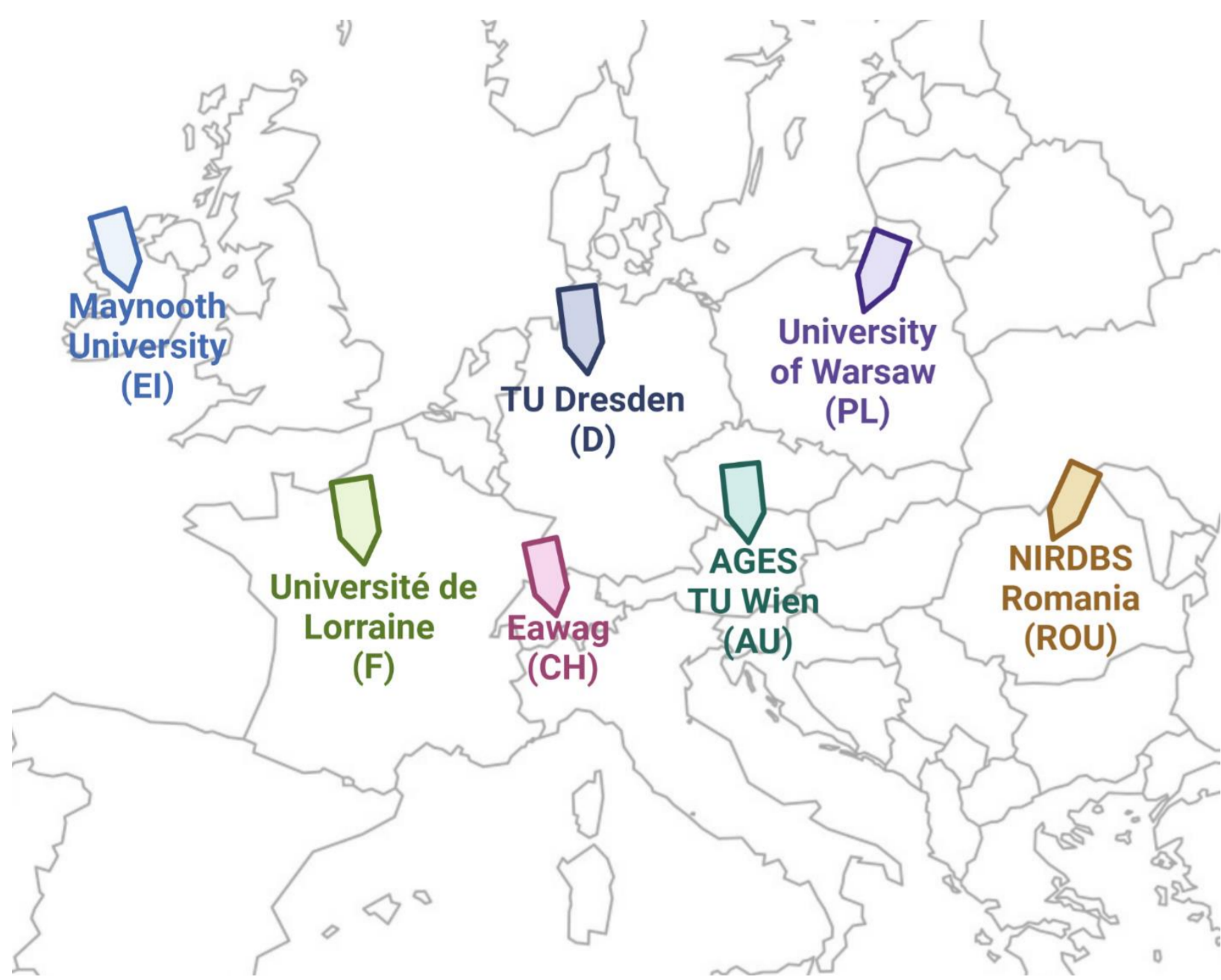
? Are the less diverse communities, which might present empty ecological niches, easier to be invaded?

STANDARDIZED METHODS across 7 countries

(WP1) FIELD SURVEY

Inter-countries East-West gradient

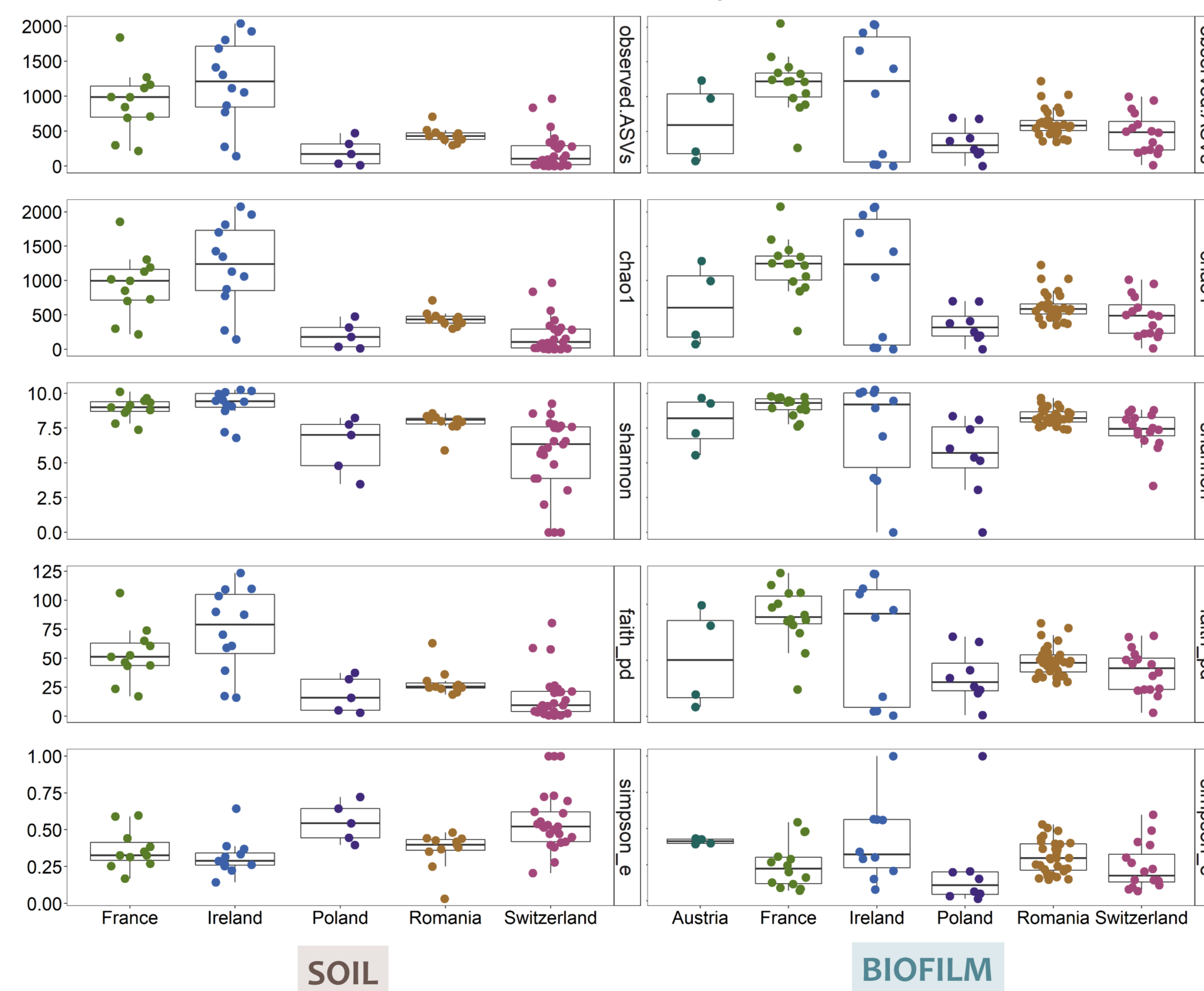
European survey of microbial and ARG diversity of soil and freshwater in the presence and absence of different degrees of human impact



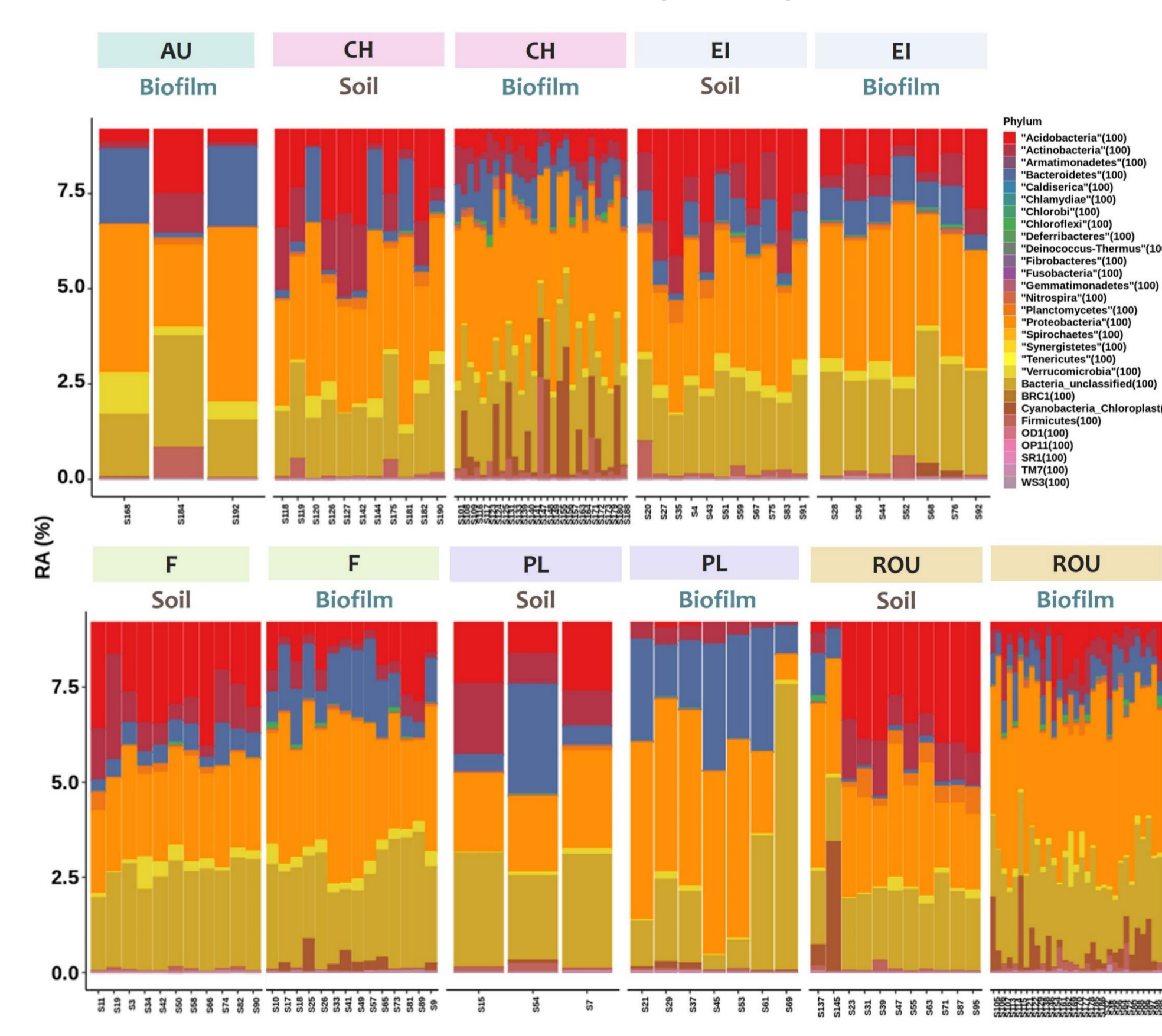
Preliminary results

Goals: i) To identify high and low diversity habitats with high/low anthropogenic impact as a basis for further experiments; ii) To report the microbial and resistance diversity distribution across countries

Microbial α-diversity distribution

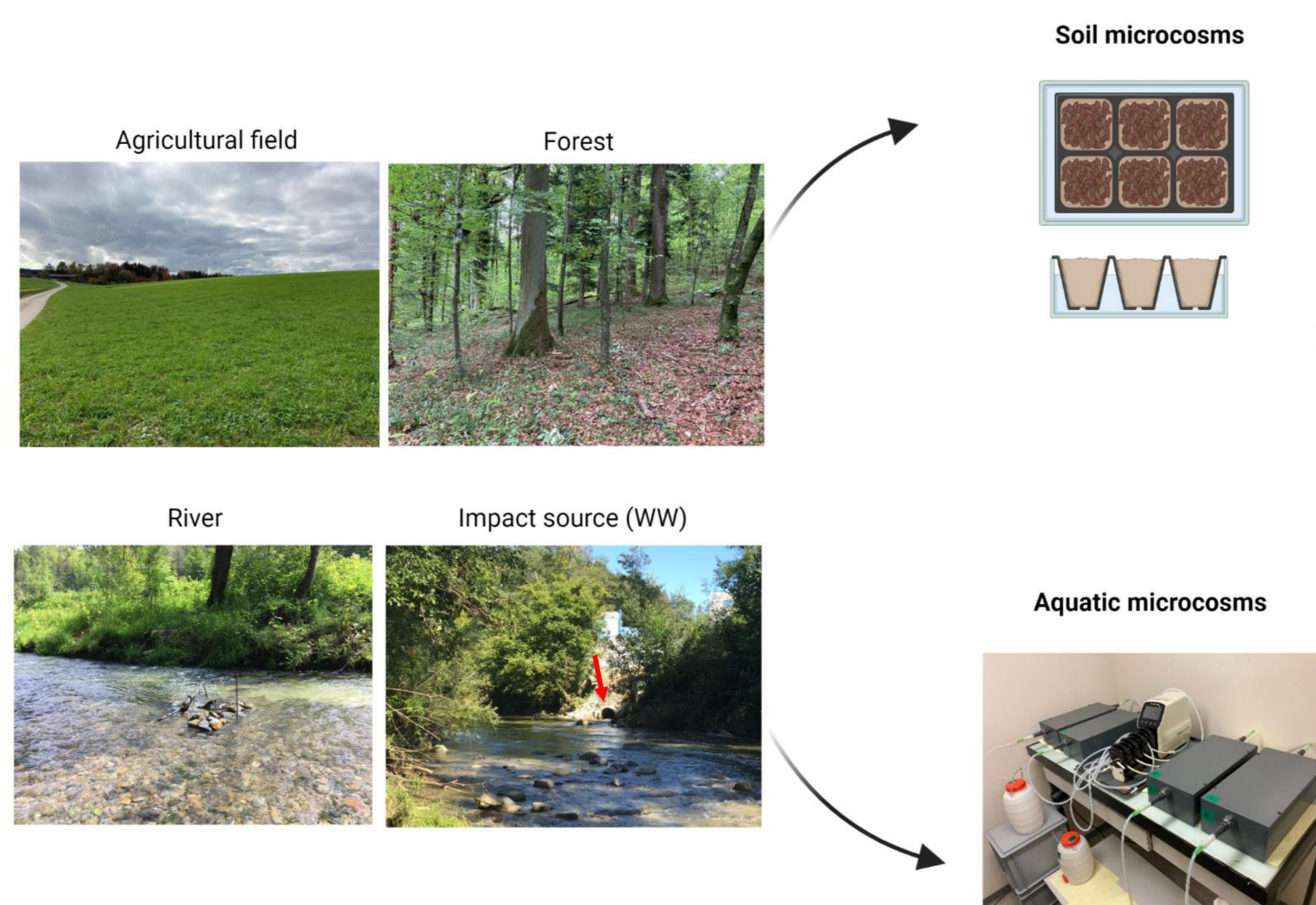


Microbial community composition



(WP2) INVASION EXPERIMENTS

Experimental assessment of diversity as an ecological barrier to the spread of ARGs/ARB in soil and freshwater microbial communities



Invasion experiments and gene transfer
Bacterial strains and plasmids, both genetically tagged to monitor their fate in the aquatic and soil microcosms

Next to come.. NGS, 16S and ITS2 whole dataset, field survey ARGs diversity

ACKNOWLEDGEMENTS:

