

Developing and Implementing a Pilot Surface Water Monitoring Effort in NARMS

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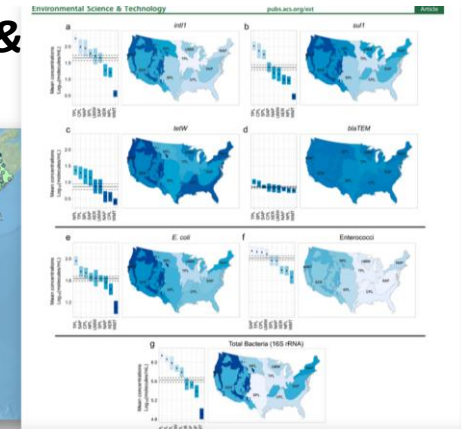
Problem

- The role of environment in amplification & transmission of AMR is poorly understood
- One Health focused NARMS needed to develop an environmental component

Action

- Focused on surface water as an integrator of inputs and perturbations within the watershed
- Developed standardized analytical approaches
 - Culture-based: *E. Coli* (ESBL), *Enterococcus* (VRE), *Salmonella*
 - Targeted gene analysis (ARGs, fecal indicators)
 - Metagenomics
- National scale probabilistic study of rivers and teams in the US (~2000 samples)
 - Comprehensive, long term trends (5 year)
 - Extensive meta-data
- Watershed focused study as a template for future targeted studies
 - Spatial and temporal drivers

EPA's National Rivers & Streams Assessment

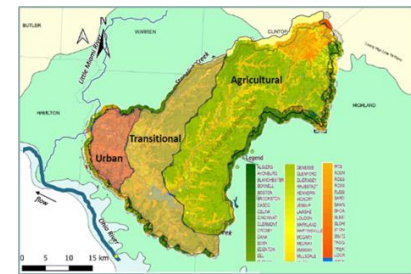


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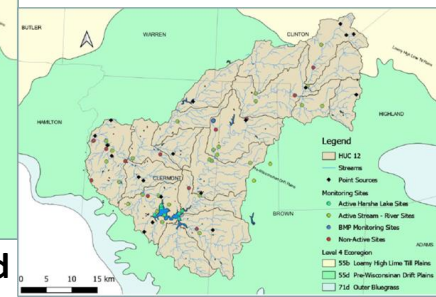
Geospatial Patterns of Antimicrobial Resistance Genes in the US EPA National Rivers and Streams Assessment Survey
Scott P. Keely,¹ Nichole E. Brinkman,² Emily A. Wheaton, Michael A. Jahne, Shawn D. Siefing, Manju Varma, Ryan A. Hill, Scott G. Leibowitz, Roy W. Martin, Jay L. Garland, and Richard A. Haugland

Cite This: <https://doi.org/10.1021/acs.est.2c00813> [Read Online](#)

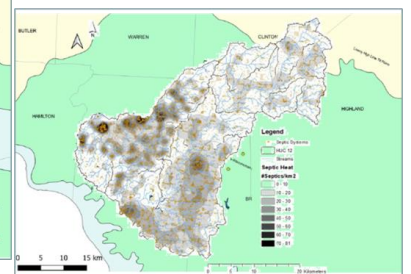
East Fork of Little Miami River (SW Ohio)



Multiple-Use Watershed



Network of Sampling Sites



Septic Tank Mapping

Status & Next Steps

- Publish watershed results (2024)
- Complete national sampling (summer 2024) and publish results (2025)
- Use results to inform design of future monitoring

