

# Luke Hillary

*Postdoctoral Scholar (Environmental Virology)*

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## Profile

I am a postdoc at UC Davis working on the effects of wildfire on soil viral communities and their microbial hosts. I have a strong track record in publications, grant capture, and research excellence (exemplified by multiple awards for science communication and research innovation) for my current career stage. My research interests focus on the role of viruses in terrestrial environments and how they influence ecological processes. I have expertise in both DNA and RNA viromics data generation and analysis and lead the first published study to use viromics to analyse RNA viral diversity in soil ecosystems. I have additional expertise in the use of q(RT)PCR for quantifying viral abundance and applying this technique to wastewater-based epidemiology. My ultimate career aim is to establish my own research program in environmental virology investigating how viruses and their host interactions impact the natural environment, public health, climate change and food security.

## Skills

Environmental soil sampling design and fieldwork

Soil physical and chemical analysis

Virus purification from soils and sewage sludge

Bacterial cultivation in minimal and enriched media

Viral cultivation and infectivity assays

PCR and qPCR primer design and molecular cloning

qPCR/ q(RT)PCR for virus quantification in wastewater and biosolids

DNAseq/ RNAseq nucleic acid extraction and library preparation

R and Python programming languages, UNIX shell scripting and use of high-performance supercomputing facilities

Bioinformatics analysis of metagenomic high-throughput sequencing data

Statistical analysis of ecological data

## Education, training and employment

**Jan 2023-present** Postdoctoral Scholar (Environmental Virology), University of California, Davis (USA)

**Jan 2022-Nov 2022** Research Officer (Environmental Virology). Bangor University (UK)

**Oct 2017-Aug 2022** PhD Biological Sciences (Viva passed with no corrections), Bangor University (UK)

**Sep 2011-Aug 2017** Secondary school chemistry teacher (ages 11-19) in various schools in North Yorkshire, UK

**Sep 2011-Jul 2012** Post-graduate certificate in education, University of York, UK

**Oct 2009-Aug 2011** Post-graduate researcher University of York, UK

**Oct 2005-Jul 2009** MBiolSci (1<sup>st</sup> class honours) Biochemistry and Microbiology

## Publications ([Google Scholar](#))

**Hillary, L. S.**, Adriaenssens, E. M., Jones, D. L. & McDonald, J. E. (2022) 'RNA-viromics reveals diverse communities of soil RNA viruses with the potential to affect grassland ecosystems across multiple trophic levels', ISME Communications, 2(1), p. 34. <https://doi.org/10.1038/s43705-022-00110-x>

**Hillary, L. S.**, Farkas, K., Maher, K. H., Lucaci, A., Thorpe, J., Distaso, M. A., Gaze, W. H., Paterson, S., Burke, T., Connor, T. R., McDonald, J. E. Malham, S. K. & Jones, D. L. (2021) 'Monitoring SARS-CoV-2 in municipal wastewater to evaluate the success of lockdown measures for controlling COVID-19 in the UK', Water research, 200, p. 117214. <https://doi.org/10.1016/j.watres.2021.117214>

Farkas, K. **Hillary, L. S.**, Thorpe, J., Walker, D. I., Lowther, J. A. McDonald, J. E. Malham, S. K., Jones, D. J. (2021) 'Concentration and Quantification of SARS-CoV-2 RNA in Wastewater Using Polyethylene Glycol-Based Concentration and qRT-PCR', Methods and Protocols, 4(1), p. 17. <https://doi.org/10.3390/mps4010017>

Farkas, K., **Hillary, L. S.**, Malham, S. K., McDonald, J. E. & Jones, D. L. (2020) 'Wastewater and public health: the potential of wastewater surveillance for monitoring COVID-19', Current Opinion in Environmental Science & Health, 17, pp. 14–20. <https://doi.org/10.1016/j.coesh.2020.06.001>

Jones, D. L., Baluja, M. Q., Graham, D. W., Corbishley, A., McDonald, J. E., Malham, S. K., **Hillary, L. S.**, Connor, T. R., Gaze, W. H., Moura, I. B., Wilcox, M. H. & Farkas, K. (2020) 'Shedding of SARS-CoV-2 in feces and urine and its potential role in person-to-person transmission and the environment-based spread of COVID-19', Science of The Total Environment, 749, p. 141364. <https://doi.org/10.1016/j.scitotenv.2020.141364>

Farkas, K., Walker, D. I., Adriaenssens, E. M., McDonald, J. E., **Hillary, L. S.**, Malham, S. K. & Jones, D. L. (2020) 'Viral indicators for tracking domestic wastewater contamination in the aquatic environment', Water Research, 181, p. 115926. <https://doi.org/10.1016/j.watres.2020.115926>

Farkas, K., Mannion, F., **Hillary, L. S.**, Malham, S. K. & Walker, D. I. (2020) 'Emerging technologies for the rapid detection of enteric viruses in the aquatic environment', Current Opinion in Environmental Science & Health, 16, pp. 1–6. <https://doi.org/10.1016/j.coesh.2020.01.007>

## Funding

**2022-2023** European Regional Development Fund SMART Expertise Project "Understanding the fate and behaviour of microplastic and viruses in biosolids (Bs2Land)" (grant writing contributor and named researcher - £423,548)

**2019-2022** Welsh Water Innovation Fund Industry Partnership (£17,000)

**2018-2019** NERC Biomolecular Analysis Facility next generation sequencing pilot project competition (£5,500)

**2017-2022** NERC/ BBSRC Soils Training And Research Studentships Centre for Doctoral Training PhD Studentship (competitive recruitment)

## Conference Presentations (Awards)

**2022** Environmental Microbial Genomics Group, Université de Lyon, France (invited seminar talk)

**2022** ISME 18, Lausanne, Switzerland (poster)

**2022** Soil Viral Workshop, Aarhus University, Denmark (talk)

**2021** European Union Town Hall meeting on SARS-CoV-2 wastewater-based epidemiology (talk)

**2020** AGU Fall Meeting 2020, San Francisco, USA (remote poster)

**2020** EGU General Assembly Congress 2020, Vienna, Austria (remote talk)

**2020** Molecular Microbial Ecology Group Meeting, Milton Keynes, UK - (talk - Microbial Genomics Oral Presentation Prize)

**2019** Society for Applied Microbiology Early Career Scientist Research Symposium, Manchester, UK (poster)

**2019** STARS Conference – Future Global Challenges for Soil Science, Windermere, UK (Poster – best poster prize)

**2018** Molecular Microbial Ecology Group Meeting, Swansea, UK (Poster – FEMS Microbiology Letters Poster Prize)

## Other Awards and Achievements

**2021** UK Institute of Water Innovation Awards 3rd place (Welsh area winner) – WEWASH – Wastewater-Based Community-Level Surveillance of COVID-19 in Wales (award nomination lead)

**2019** Best presentation at the School of Biological Sciences for 3rd Year Talks, Bangor University, UK

**2018** Best presentation at the School of Biological Sciences for 1st Year Talks, Bangor University, UK

**2014** Nominated for a national teaching award

**2009** William Ferdinand Memorial Medal (for highest overall weighted mean grade in 4th year, Department of Molecular Biology and Biotechnology, University of Sheffield, UK)

**2009** Mike Fowler Medal for Creative Science (in a 3rd or 4th year project or literature review, Department of Molecular Biology and Biotechnology, University of Sheffield, UK)

## Service and Outreach

Member of the International Society for Microbial Ecology

STARS Centre for Doctoral Training Management Board – Student cohort representative

School of Natural Sciences, Bangor University Biology/ Zoology Postgraduate Researcher representative 2017-2019

I have engaged in multiple industry and public outreach activities with organisations such as the UK Institute of Water, “The University of the Third Age” and “I’m a Scientist, Get Me Out of Here” and have been interviewed on my research for Times Radio.

I have reviewed manuscripts for publication in various journals including Microbiome, Water Research, Nature Sustainability, mSystems and PloS One.