

**VALERIE J. HARWOOD  
CURRICULUM VITAE: 2024**

University of South Florida  
Department of Integrative Biology, SCA 110  
4202 East

**Telephone:** (813) 974-6229



Harwood out of total \$277,000.

2016-2021. Coastal SEES Collaborative Research: Integration of Human B

*Acinetobacter*, *Aeromonas*, and *Pseudomonas* as Environmentally Relevant Pathogens in Wastewater and Surface Water. *Curr Environ Health Rep.* Jun;10(2):154-171. doi: 10.1007/s40572-023-00393-9.

2022. Davis BC, Keenum I, **Calarco J**, Liguori K, Milligan E, Pruden A, Harwood VJ<sup>a</sup>. Towards the standardization of *Enterococcus* culture methods for waterborne antibiotic resistance monitoring: A critical review of trends across studies. *Water Res X.* 2022 Nov

- JG, Servetas SL, Hunter ME, Jackson SA, Shanks OC. Interlaboratory performance and quantitative PCR data acceptance metrics for NIST SRM® 2917. *Water Res.* 2022 Oct 15;225:119162. doi: 10.1016/j.watres.2022.119162.
2021. **Nguyen, Karena H.**, Philipp H. Boersch-Supan, Rachel B. Hartman, Sandra Y. Mendiola, Valerie J. Harwood, David J. Civitello, Jason R. Rohr. Interventions can shift the thermal optimum for parasitic disease transmission. *Proceedings of the National Academy of Sciences* Mar 2021, 118 (11) e2017537118; DOI: 10.1073/pnas.2017537118
2021. Laureano-Rosario AE, **Symonds EM, González-Fernández A**, Lizano R OG, Mora Alvarado D, Rivera Navarro P, Badilla-Aguilar A, Rueda-Roa D, Otis DB, Harwood VJ, Cairns MR, Muller-Karger FE. The relationship between environmental parameters and microbial water quality at two Costa Rican beaches from 2002 to 2017. *Mar Pollut Bull.* 163:111957.
2021. **González Fernández A§, EM Symonds§, J F Gallard-Gongora**, B Mull, JO. Lukasik, P Rivera Navarro, A Badilla Aguilar, J Peraud, ML Brown, D Mora Alvarado, M Breitbart, MR Cairns and VJ Harwood<sup>a</sup>. Relationships among microbial indicators of fecal pollution, microbial source tracking markers, and pathogens in Costa Rican coastal waters. *Water Research* 188: 116507. doi: 10.1016/j.watres.2020.116507
- §Co-first authors
2020. **Nieuwkerk DM**, Korajkic A, **Valdespino EL**, Herrmann MP, Harwood VJ<sup>a</sup>. Critical review of methods for isothermal amplification of nucleic acids for environmental analysis. *J Microbiol Methods.* 179:106099.
2020. **Lobos A**, Harwood VJ, Scott KM, Cunningham JA. Tolerance of three fungal species to lithium and cobalt: Implications for bioleaching of spent rechargeable Li-ion batteries. *J Appl Microbiol.* 2021 Aug;131(2):743-755. doi: 10.1111/jam.14947. Epub 2021 Jan 9. PMID: 33251646.
2020. Korajkic A, McMinn BR, Staley ZR, Ahmed W, Harwood VJ<sup>a</sup>. Antibiotic-Resistant *Enterococcus* Species in Marine Habitats: A Review. *Curr Opin Environ Sci Health.* 2020 Aug 1;19:92-100.
2019. **Young S**, Rohr JR, Harwood VJ<sup>a</sup>. Vancomycin resistance plasmids affect persistence of *Enterococcus faecium* in water. *Water Res.* 2019 Dec 1;166:115069. doi: 10.1016/j.watres.2019.115069. Epub 2019 Sep 7.
2019. Korajkic A, P Wanjugi, L Brooks, Y Cao and VJ Harwood<sup>a</sup>. Persistence and decay of fecal microbiota in aquatic habitats. *Microbiol and Molec Biol Rev.* 83(4) pii: e00005-19. doi: 10.1128/MMBR.00005-19. Print 2019 Nov 20.
2019. Weiskerger CJ, Brandão J, Ahmed W, Aslan A, Avolio L, Badgley BD, Boehm AB, Edge TA, Fleisher JM, Heaney CD, Jordao L, Kinzelman JL, Klaus JS, Kleinheinz GT, Meriläinen P, Nshimyimana JP, Phanikumar MS, Fig 1 224.5 205.25 Tm1t100912 0 612 79.19 Tm0 g0 C



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2017. Mantha S, Anderson A, Acharya SP, Harwood VJ, Weidhaas J. Transport and attenuation of *Salmonella enterica*, fecal indicator bacteria and a poultry litter marker gene are correlated in soil columns. *Sci Total Environ.* 598:204-212.
2017. Kirs M, Kisand V, Wong M, Caffaro-Filho RA, Moravcik P, Harwood VJ, Yoneyama B, Fujioka RS. Multiple lines of evidence to identify sewage as the cause of water quality impairment in an urbanized tropical watershed. *Water Res.* 116:23-33.
2017. Symonds EM, **Young S**, Verbyla ME, McQuaig-Ulrich SM, Ross E, Jiménez JA, Harwood VJ, Breitbart M. Microbial source tracking in shellfish harvesting waters in the Gulf of Nicoya, Costa Rica. *Water Res.* 2017 Jan 3;111:177-184.
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2016. Wanjugi P, Sivaganesan M, Korajkic A, Kelty CA, McMinn B, Ulrich R, Harwood VJ, Shanks OC. Differential decomposition of bacterial and viral fecal indicators in common human pollution types. *Water Res.* 105:591-601. doi: 10.1016/j.watres.2016.09.041.
2016. **Wanjugi P**, Fox GA, Harwood VJ<sup>a</sup>. The Interplay Between Predation, Competition, and Nutrient Levels Influences the Survival of *Escherichia coli* in Aquatic Environments. *Microb Ecol.* 72:526-37. doi: 10.1007/s00248-016-0825-6.
2016. **Young S**, Nayak B, Sun S, Badgley BD, Rohr JR, Harwood VJ<sup>a</sup>. 2016. Vancomycin-Resistant Enterococci and Bacterial Community Structure following a Sewage Spill into an Aquatic Environment. *Appl Environ Microbiol.* 2016 Aug 30;82(18):5653-60.

2015. **Staley ZR**, Harwood VJ, Rohr JR. A synthesis of the effects of pesticides on microbial



2014. Ryu H, Elk M, Khan IU, Harwood VJ, Molina M, Edge TA, Domingo JS. Comparison of two poultry litter qPCR assays targeting the 16S rRNA gene of *Brevibacterium* sp. *Water Res.* 1;48:613-21.
2014. Harwood VJ<sup>a</sup>, **Staley C**, **Badgley BD**, Borges K, **Korajkic A**. Microbial source tracking markers for detection of fecal contamination in environmental waters: relationships to pathogens and human health outcomes. *FEMS Microbiol Rev.* 38:1-40\*
2013. **Korajkic A**, **Wanjugi P**, Harwood VJ. Indigenous microbiota and habitat influence *Escherichia coli* survival more than sunlight in simulated aquatic habitats. *Appl Environ Microbiol.* 79: 5329-5337
2013. **Staley ZR**, **Chase E**, Mitraki C, Crisman TL, Harwood VJ<sup>a</sup>. Microbial water quality in freshwater lakes with different land use. *J Appl Microbiol.* 115:1240-1250.
2013. Harwood VJ<sup>a</sup>, Boehm AB, Sassoubre LM, Vijayavel K, Stewart JR, Fong TT, Caprais MP, Converse RR, Diston D, Ebdon J, Fuhrman JA, Gourmelon M, Gentry-Shields J, Griffith JF, Kashian DR, Noble RT, Taylor H, Wicki M. Performance of viruses and bacteriophages for fecal source determination in a multi-laboratory, comparative study. *Water Res.* 47:6929-43
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2013. **K.V. Gordon**, M. Brownell, S. Wang, J.E.angm {9(Mpo,(.)-9( )-9(J)9(.-)A9(.)]TJETQq0.00000912 0 61

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2012. **C.M. Staley**, K.H. Reckhow, J. Lukasik and V.J. Harwood<sup>a</sup>. Assessment of sources of human pathogens and fecal contamination in a Florida freshwater lake. *Water Res.* 46:5799-812.

2012. **Z.R. Staley**, **J.K. Senkbeil**, J.R. Rohr and V.J. Harwood<sup>a</sup>. Lack of direct effects of agrochemicals on zoonotic pathogens and fecal indicator bacteria. *Appl Environ Microbiol.* 2012 Nov;78(22):8146-50.

2012. **S.M. McQuaig**, J. Griffith and V\* nBT/F1 12 Tf1 0 0 1 190.87 614.11 Tm0 g0 G( )JTJETQhG2K3 Tm0 g







(ARB/ARGs) in Surface Water, Wastewater, and Recycled Water. Denver, CO: The Water Research Foundation Project 5052. 239 pp. ISBN: 978-1-60573-619-8.

2011. V.J. Harwood. Validation of Rapid Methods for Enumeration of Markers for Human Sewage Contamination in Recreational Waters. WERF Report PATH3C09.



Annual WaterReuse Symposium. Sept 13, Tampa, FL.

2016. Life and Death in a Tough Spot: Persistence of Fecal Microbiota in the Environment.  
Water Microbiology Conference. May 20, UNC C



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2023. Liguori K, Keenum I, ...Harwood VJ and Pruden A. Validation of qPCR-Based Monitoring of Antimicrobial Resistance Genes *sul1* and *int11* in wastewater, recycled water, and surface waters across the United States. 2023 AEESP Research and Education Conference June 20-23 Boston, MA (T)
2022. **Nieuwkerk, D.M., Lobos, A.E., Gallard-Góngora, J.F.**, Harwood, V.J. Recovery Efficiency of Polyester, Nylon-flocked, and Sponge Swabs for Recovering Fecal Bacteria from Untreated Sewage Influent. Southeastern Branch Am Society for Microbiol Conference, Savannah GA Nov 4-6, (P).
2022. **Salute, K., Korde, R., Lobos, A**, Harwood, V.J. Detection of Human-Associated H8 from *Escherichia coli* in Sewage Spiked Surface Water. Florida Branch Am Society for Microbiol Conference, Orlando FL Oct 21-23 (P).
2022. **Tabuchi, M**, Harwood, VJ, Luba KD, Paperno, R, Cody, TT. Prevalence and antibiotic resistance characteristics of the indicator bacteria, *Enterococcus* species and *Escherichia coli* isolated from coastal marine sport fish in Florida. American Fisheries Society Florida Meeting Haines City, FL Apr 5-7 (T).
2022. Jesser, K.J., V. Alban, **A. Lobos, J. Gallard-Góngora**, G. Trueba, V.J. Harwood, K. Levy. Microbial source tracking of human and animal fecal contamination in household settings in northern Ecuador. American Society of Tropical Medicine and Hygiene Annual Meeting. Seattle, WA. Oct 30-Nov 3. (P)
2022. Liguori, K., Keenum, I., **Calarco, J.**, Davis, B.C., Milligan, E., Maldonado Rivera, G., Kurowski, A., Harwood, V. J., Pruden, A. Multi-lab Validation of Standardized Methods for Antibiotic Resistance Monitoring of Wastewater, Recycled Water, and Surface Water. Sixth conference on the Environmental Dimension of Antibiotic Resistance (EDAR6) | Gothenburg, Sweden | September 23-27
2022. Liguori, K., Keenum, I., **Calarco, J.**, Davis, B.C., Milligan, E., Maldonado Rivera, G., Kurowski, A., Harwood, V. J., Pruden, A. Towards Standardizing Antimicrobial Resistance Monitoring of Water Environments: an expert survey, expert workshop, and multi-lab validation study. Poster presented at: The 2022 Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference. June 28-30; St Louis, MO.
2022. Harwood, VJ and A Lobos. Persistence of Human-Associated Genetic Markers in Conventional and Advanced Treated Wastewater: Implications for Microbial Source Tracking in Surface Waters. ASM Microbe June 9-13; Washington DC
2020. **K.H. Nguyen**, P. Boersch-Supan, V.J. Harwood, J.R. Rohr. Mismatches in thermal optima of *Schistosoma mansoni* and *Biomphalaria* spp. life-history traits shift the thermal optimum of human schistosomiasis transmission under different intervention scenarios. Am Soc Tropical Med Hygiene Annual Conference Online. November 17-20, 2020.
2020. **J. Calarco**, J. Peraud, I. Keenum, E. D. Garner, A. Pruden, V. J. Harwood. Multi-drug Resistant Pathogens Isolated from Recycled Water Treatment Trains. ASM Microbe Meeting Online. July 2020

2020. **J. Gallard-Góngora**, A. Lobos, J. Peraud, V.J. Harwood. Comparing methods of bacterial

- Tracking and Nutrient Level Assessment in Two Impaired Tampa Bay Tributaries. UNC Water Microbiology Conference. May 22-24, 2018. Chapel Hill, NC. 2017. (T)
2017. W. Ahmed, **A. Lobos**, **J. Senkbeil**, J. Peraud, **J. Gallard**, and V.J. Harwood. Novel CrAssphage Marker Assessed for Microbial Source Tracking (MST) Applications in Tampa, FL. Southeastern Branch of the American Society for Microbiology 103rd Annual Meeting. St. Petersburg, FL. 10-12 November.
2017. **Nguyen, K.**, C. Senay, **S. Young**, B. Nayak, **J. Senkbeil**, **A. Lobos**, **J. Conrad**, V.J. Harwood. Detection of Wild Animal Sources of Fecal Indicator Bacteria by Microbial Source Tracking (MST) Influences Regulatory Decisions. Southeastern Branch of the American Society for Microbiology 103rd Annual Meeting. St. Petersburg, FL. 10-12 November.
2017. **Conrad, J. W.** and V. J. Harwood. DNA Methylation is a Potential Regulator of Virulence Associated Gene Expression in *Vibrio vulnificus*. Oral. American Society for Microbiology Southeastern Branch Meeting. St. Petersburg, Florida. 10-12 November. (T)
2017. **Conrad, J. W.** and V. J. Harwood. Epigenetic Modifications are Potential Regulators of Virulence Associated Gene Expression in *Vibrio vulnificus*. Oral. Florida Branch American Society for Microbiology. Clearwater, Florida. 13 October. (T)
2017. **Conrad, J.** and Harwood, V.J. Potential for epigenetic modifications to influence *Vibrio vulnificus* virulence. FEMS Microbiology Conference 2017, July 9-13, Valencia, Spain
2017. **Young, S.**, V. J. Harwood, J. Rohr. Resistance Elements & Nutrient Concentrations Impact Survival of Vancomycin Resistant Enterococci in Aquatic Environments. ASM Microbe. Jun 1-5. New Orleans, LA.
2017. **Lobos, A.**, J. Cunningham, V.J. Harwood. Fungal Bioleaching of Lithium and Cobalt from Spent Rechargeable Li-ion Batteries: Are Leached Metals Toxic to the Fungi? ASM Microbe. Jun 1-5. New Orleans, LA.
2017. Korajkic, A, B R McMinn, V J Harwood



2014 - 2018 Fulbright Specialist Peer Review

- 2013. Zachery Staley, Ph.D. Currently employed as Scientist, US Environmental Protection Agency (co-mentored with Dr. Jason Rohr).
- 2012 Eva Chase, Ph.D. Awarded Ph.D. posthumously
- 2012 Christopher Staley, Ph.D. Assistant Professor, Department of Surgery, University of Minnesota
- 2010 Asja Korajkic, Ph.D. Microbiologist at U.S. Environmental Protection Agency, Cincinnati, OH.
- 2010 Keith Michael Garman, Ph.D. President, Garman Engineering Company, LLC. (co-mentored with Dr. James Garey).
- 2009 Brian Badgley, Ph.D. Associate Professor at Virginia Tech, Blacksburg VA.
- 2009 Bina Nayak, Ph.D. Currently employed as Water Research Manager, Pinellas County Utilities, Florida
- 2009 Shannon McQuaig, Ph.D. Professor at St. Petersburg College (FL)
- 2008 Katrina V. Gordon. Ph.D. Core facility manager (Microscopy Co

