CRESTEN MANSFELDT
Assistant Professor
Department of Civil, Environmental, and Architectural Engineering
University of Colorado, Boulder

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MAIN RESEARCH GOALS/EXPERTISE

- **Monitor and describe the fate and biotransformation of anthropogenic pollutants in aquatic systems**
- **Enhance and domesticate microbial communities associated with bioremediation, bioproduction, waste management, and public infrastructure**
- **Construct and apply statistical and mechanistic models predicting the behavior of microorganisms in engineered environments**

EDUCATION

08/2007-01/2013	**Cornell University, Department of Civil and Environmental Engineering** PhD Studies in Environmental Engineering and Environmental Microbiology
09/2004-06/2007	**University of Minnesota, Department of Civil and Environmental Engineering** Undergraduate Studies in Civil and Environmental Engineering

ACADEMIC DEGREES & ENGINEERING LICENSE

2013	**Doctoral Degree in Environmental Engineering with Minors in Environmental Microbiology and Environmental Quality, Cornell University** Doctoral Thesis: ‘‘Data driven hypothesis modeling of *Dehalococcoides mccartyi*: predicted biology and biomarkers of stress in two mixed microbial communities” Advisor: Dr. Ruth Richardson, Committee: Dr. James Gossett, Dr. Stephen Zinder
2008	**Fundamentals of Engineering License**
2007	**Bachelors of Civil Engineering, University of Minnesota, Department of Civil and Environmental Engineering** Honors Thesis: ‘‘Isolation and purification methods for an anaerobic dechlorinator capable of polychlorinated biphenyl degradation” Advisor: Dr. Paige Novak

PROFESSIONAL EXPERIENCE

07/2019-Current	**University of Colorado Boulder, Department of Civil, Environmental, and Architectural Engineering** Assistant Professor
10/2015-06/2019	**Swiss Federal Institute of Aquatic Science and Technology (Eawag), Department of Environmental Chemistry** Postdoctoral research position, Advisor: Dr. Kathrin Fenner
12/2012-04/2015	**Cornell University, Department of Biological and Environmental Engineering (BEE)** Postdoctoral research position, Advisors: Dr. Beth Ahner, Dr. Ruth Richardson
08/2014-08/2015	**Vireo Quantum Instruments** Startup-based research position
02/2013-09/2015	**American Journal of Experts** Contracted Editor
05/2011-07/2011	**Helmholtz Zentrum für Umweltforschung (UFZ)** Visiting researcher during PhD studies
08/2007-12/2012	**Cornell University, Department of Civil and Environmental Engineering (CEE)** Graduate student research assistant
08/2006-08/2007	**University of Minnesota, Department of Civil and Environmental Engineering** Undergraduate student research assistant
05/2006-08/2006	**National Institute of Standards and Technology** Summer Undergraduate Research Fellow (SURF)
04/2005-05/2006	**University of Minnesota, Department of Civil and Environmental Engineering** Undergraduate student research assistant

EXTERNAL RESEARCH GRANTS

07/2021-06/2024	Environmental Protection Agency EPA-2020-STAR-C2 Early Career, Sole PI, $337,616, “EcoGenoRisk: identifying Potential Ecological Risks Posed by a Novel Genome

INTERNAL RESEARCH EFFORTS

07/2020-12/2021	University of Colorado Boulder Pandemic Response Sole PI, $614,862, On-Campus sewer monitoring for SARS-CoV-2 prevalence.

AWARDS & EDUCATIONAL GRANTS

2021	**Sterns Faculty Staff Service Award** University of Colorado Boulder, Alumni Association; In recognition for participation on the Pandemic Response Science Team
2021	**Departmental Service Award** University of Colorado Boulder, Department of Civil, Environmental and

Architectural Engineering

2018 **Best Student/PostDoc Poster Prize**
Gordon Research Conference: Environmental Sciences – Water

2011 **Graduate School International Research Fellowship**
Cornell University

2011 **Biogeochemistry and Biocomplexity Small Grant**
Cornell University

2008 **Graduate Research Fellowship (GRF)**
National Science Foundation (NSF)

2007 **Olin Fellowship**
Cornell University

2007 **Claire and Simon Benson Award – Outstanding Undergraduate**
University of Minnesota, Dept. of Civil and Environmental Engineering

2007 **Summa Cum Laude with Highest Honors (GPA 3.987/4.0)**
University of Minnesota

2004 **University of Minnesota Maroon and Gold Fellowship**

TEACHING

CLASSROOM BASED INSTRUCTION

2019-Current **University of Colorado - Boulder**

Spring 2020,2021 Fall 2021	CVEN 4834/5544 – Solid Waste
Fall 2019,2020	CVEN 5484 – Applied Microbiology and Toxicology
Spring 2021	EVEN 4484 - Introduction to Microbiology

2016-2019 **Swiss Federal Institute of Aquatic Science and Technology (Eawag), Department of Environmental Chemistry**
Practical Uchem Multivariate Analysis Seminar

2008-2013 **Cornell University**

Teaching Assistant (Instructor):

2013 CEE4510 Microbiology for Environmental Engineers
2012 CEE4530 Laboratory Research in Environmental Engineering
2011 R Data Analysis Seminar Series for Graduate Students
2010 ENGR 1060 Explorations in Engineering

Teaching Assistant (Grader):

2010 CEE 4510 Microbiology for Environmental Engineers
2010 CEE 3510 Environmental Quality Engineering
2009 CEE 6550 Mixing, Transport, and Transformation in the Environment
2009 CEE 3510 Environmental Quality Engineering
2008 CEE 6530 Water Chemistry in Environmental Engineering

RESEARCH BASED INSTRUCTION

University of Colorado - Boulder
Supervisor of seventeen undergraduate students, 6 post baccalaureate students, 2 lab technicians, and 2 PhD students.

Undergraduate Students

- Michaela Alkire, Claire Butler, Elle Coe, Nicolas Freeman, Heidi Heuer, Madeline Karr, Sara Key, Jeffery Jones, Keaton Jones, Kamila Khojalakova, Kiersten Maxwell, Lauren Nelson, Nikolas Ortega, Emily Saldana, Lewis Salveson, Rachel Shea, Trace Shimek, Samiha Singh, Kate Tomlinson, Jorge Vargas-Barriga, Bailey Vigil, Julia Witteman (all completed 2021)

Post Baccalaureate Students

- Jacob Lilienfeld, Shelby Litton, John Maggi, Kerry O'Connor, Kevin Pulley, Breanna Real, Paul Wilkerson, Gordon Zak (all completed 2021)

Lab Technicians

- Antonio Feula, Jennifer Liebig (both Jan – May 2021)

PhD Students

- William Johnson, Anna Ulanova, Katelyn Reeves (on leave)

Swiss Federal Institute of Aquatic Science and Technology (Eawag), Department of Environmental Chemistry

Supervisor of two master theses at ETH Zürich

- Marcel Müller, 2018 “Cometabolic Biotransformation of Micropollutants using Pure Enzymes.” Continuing as an ETH PhD Student.
- Matteo Fermini, 2018 “Ion Trapping in Protozoa: Evaluation of a Competitive Relationship between Amine-Containing Micropollutants and Ammonia”

Cornell University

Supervisor of two undergraduate students

- Garrett Debs, 2012-2014, “Characterization of a Mixed Culture of *Dehalococcoides* containing Strains from the Commercial KB1 and Cornell’s Donna Culture” Honors thesis. Current Yale PhD Student.
- Michael Kuan, 2015, Summer Research, focusing on the assembly of *Chlorella* transcriptomes

COMMUNITY ENGAGEMENT

OUTREACH & VOLUNTEER ACTIVITIES

2020-Current	**AEESP Distinguished Lecture Committee Member**
2020-Current	**Front Range CDPHE Funded Wastewater-Based Epidemiology SARS-CoV-2 Collective Committee Member**
2020-2021	**University of Colorado COVID Testing Committee Member**
2020	**CEAS Sanitation and PPE Committee Member**
2019-2020	**CU Boulder EVEN Grad Program Committee Member**
2019-Current	**CU Boulder CEAE Grad Program Committee Member**
2016-2019	**Vice Chair** Vote-from-Abroad, Democrats Abroad Switzerland Chapter
2018	**Discussion Panelist Member** Kantonsschule Wohlen
2011-2013	**Seminar Committee Member** Cornell University Biogeochemistry, Environmental Science, and Sustainability Graduate Student Association (BESS)
2012	**Small Grant Review Board Member** Cornell University BESS
2007-2012	**Civil and Environmental Engineering Representative** Cornell University Graduate and Professional Student Assembly (CU GPSA)
2011-2012	**Provost's NYC Tech Campus Graduate Advisory Committee Member**
2010-2011	**President,** CU GPSA
2009-2010	**Student Advocacy Chair,** CU GPSA
2008-2010	**Faculty Senate Liaison,** CU GPSA
2009-2010	**Student Advocacy Chair,** CU GPSA
2009-2010	**Childcare Subcommittee Member** Cornell University
2008-2009	**Cornell Campus Planning Committee Member** Cornell University
2008-2010	**Social Chair** Cornell University, Civil and Environmental Engineering GSA
2010	**Expanding Your Horizons Volunteer** Cornell University
2005-2007	**Undergraduate Peer Advisor** University of Minnesota
2006-2007	**Tau Beta Pi Engineering Honors Society Treasurer** University of Minnesota

CONFERENCE ORGANIZATION

2020: **Reconnecting Environmental Assistant Professors**

2010: **Cornell Engineering Research Conference (CERC)**
2010: **Ithaca Ignite**

PEER REVIEWING ACTIVITIES

National Science Foundation ECO-CBET Grant Review Panel Dec 2021, Natural Sciences and Engineering Research Council of Canada, Engineering Science and Technology (ES&T), Water Research, Chemosphere, Water and Environment Journal, Environmental Science: Water Research & Technology, Journal of Hazardous Materials, Biotechnology for Biofuels, Journal of Applied Phycology, Applied Microbiology and Biotechnology

SELECTED PRESENTATIONS

INVITED SPEAKER

Mansfeldt, C. *Squishy Infrastructure: Balancing Risks and Rewards in the Built Environment Microbiome.* Oct 27, **2021**. Penn State Microbiome Seminar Series (In Person)

Mansfeldt, C. *Balancing the Utility of Wastewater Surveillance with the Ethics of Privacy.* Sept 10, **2021**. University of Colorado Boulder EVEN Friday Seminar Series

Mansfeldt, C. *Structuring EcoGenoRisk: Bioinformatic Mining of Expanding Genomic Databases to Predict Ecological Hazards and Risks.* July 28, **2021**. Environmental Protection Agency Novel Biotech Workshop.

Mansfeldt, C. *CUSew: On Campus Sewage Monitoring for SARS-CoV-2* May 12, **2021**. RCN NSF WBE Consortium Seminar Series

Mansfeldt, C. *Informative Rivers:Microbiomes in Sewers from Source to Release* April 22, **2021**. Microbiome Centers Consortium Seminar Series.

Mansfeldt, C. *The Medium is the Message : Managing the Information Content of Waste* March 2, **2021**. Arizona State University Environmental Engineering Seminar Series.

Mansfeldt, C. *Where do you end?* February 26, **2021**. American Water Resources Association Colorado Section (AWRA-CO)

Mansfeldt, C. *CUSew: Monitoring Campus Community Health Down the Drain*. December 15, **2020**. South Platte Coalition for Urban River Evaluation Joint Board/Monitoring Committee Meeting.

Mansfeldt, C., Bjorkman, K. *Detection: How can Dorm Wastewater Testing Complement Individual Monitoring?* November 20, **2020**. BioFroniters Fall Meeting, University of Colorado Boulder.

Mansfeldt, C. *CUSew: Campus Sewer Monitoring for SARS-CoV-2*. November 20, **2020**. Front Range American Biological Safety Association Meeting.

Mansfeldt, C. *Campus Wastewater Monitoring Keeps COVID-19 in Check*. October 16, **2020**. Chancellor's Parent Leadership Society Board Meeting, University of Colorado Boulder.

Mansfeldt, C. *Life, On-Campus Wastewater Monitoring*. August 12, **2020**. CU Boulder COVID Research Solutions for Campus: Health assessment, surveillance and testing; University of Colorado Boulder

Mansfeldt, C. *Life, Death, and the Accidental Sponge : Activated Sludge in the 21st Century*. March 6, **2020**. Environmental Engineering Seminar, Colorado School of Mines.

Mansfeldt, C. *Learning from Ecology: Identifying the fate of trace organic contaminants in municipal activated sludge*. September 18, **2019**. CIRES Center of Microbial Exploration Seminar, University of Colorado Boulder.

Mansfeldt, C. *Manipulating and modelling the activated sludge microbial community to clarify the fate of trace organic contaminants*. March 26, **2019**. University of Newcastle

Mansfeldt, C., Achermann, S., Walser, J.C., Johnson, D., & Fenner, K. *The influence of the microbial residence time on the taxonomic and functional composition of microbial communities*. September 11, **2018**. ETH Zürich Genomics Diversity Center (GDC) Symposium

CONFERENCE

Mansfeldt, C. *CUSew: Campus Sewer Monitoring for SARS-CoV-2.* Oral Presentation. Jan 8 **2021**. TheSTATConference, Denver, Colorado.

Mansfeldt, C., Fermini, M., Vogler, B., & Fenner, K. *Entwined factors: the influence of ammonia on protozoa's interaction with trace organic contaminants*. Oral Presentation. April 28 – May 3 **2019**. TransCon2019, Ascona, Switzerland.

Mansfeldt, C., Achermann, S., Walser, J.C., Johnson, D., & Fenner, K. *The influence of the mean-cell residence time on community composition and micropollutant biotransformation*. Poster Presentation. June 23-29, **2018**. Gordon Research Conference and Seminar: Environmental Sciences – Water. Holderness, New Hampshire, United States of America.

Mansfeldt, C., Achermann, S., Vogler, B., Bianco, V., & Fenner, K. *Sulfonamide biotransformation: Transformation product elucidation and linked gene-transcript identification*. Oral Presentation. September 17-20, **2017**. Micropol2017, Vienna, Austria.

Mansfeldt, C., Achermann, S., Udert, K., Vogler, B., Joss, A., & Fenner, K. *Micropollutant profiles and biotransformation capabilities of aerobic reactors treating domestic urine*. Poster Presentation. March 7-8, **2017**. ATHENE Workshop, Koblenz, Germany.

Mansfeldt, C., Achermann, S., Udert, K., Kipf, M., Latino, D., Joss, A., & Fenner, K. *Linking the bacterial community succession in an aerobic reactor treating urine to the time-varying biotransformation of micropollutants*. Poster Presentation. August 21-26, **2016**. International Society of Microbial Ecology – ISME16, Montreal, Canada.

Mansfeldt, C., Heavner, G., Rowe, A., & Richardson, R. *Stress Responses Detected in the Transcriptomes and Proteomes of* Dehalococcoides mccartyi *strains*. Poster Presentation. May 17-20, **2014**. American Society of Microbiology General Meeting. Boston, Massachusetts, United States of America.

Mansfeldt, C., & Richardson, R. *The Art and Comics of Environmental Engineering*. Poster Presentation. July 14-16, **2013**. Association of Environmental Engineering and Science Professors National Meeting. Golden, Colorado, United States of America.

Mansfeldt, C., Heavner, G., Rowe, A., Richardson, R., Church, B., & Hayette, H. *Modeling gene interactions with experimental parameters for* Dehalococcoides ethenogenes *strain 195*. Poster Presentation. June 16-19, **2012**. American Society of Microbiology General Meeting. San Francisco, California, United States of America.

Mansfeldt, C., Richardson, R., Heavner, G., Rowe, A., Hug, L., Edwards, E., Church, B., & Hayette, H. *Comparing network reconstructions of two* Dehaloccocoides *species in mixed culture*. Poster Presentation. June 16-19, **2012**. American Society of Microbiology General Meeting. San Francisco, California, United States of America.

PUBLICATIONS & PATENTS

PUBLICATIONS:

Reeves, K, Liebig, J., Feula, A., Saldi, T., Lasda, E., Johnson, WJ, Lilienfeld, J, Maggi, J.R., Pulley, K., Wilkerson, PJ, Real, B, Zak, G, Davis, JC, Fink, MR, Gonzalez, P, Hager, CR, Ozeroff, C, Tat, KL, Alkire, ML, Butler, CE, Coe, E, Darby, J, Freeman, N, Heuer H, Jones, JR, Karr, M, Key, S, Maxwell, K, Nelson, L, Saldana, EM, Salveson, L, Shea, R, Tomlinson, K, Vargas-Barriga, J, Vigil, B, Brisson, G, Parker, R, Leinwand, LA, Bjorkman, KK, and Mansfeldt, C. **2021**. High-resolution within-sewer SARS-CoV-2 surveillance facilitates informed intervention. *Water Research.* 204: 117613.

McClary-Gutierrez, J. S., Aanderud, Z. T., Al-Faliti, M., Duvallet, C., Gonzalez, R., Guzman, J., Holm, R., Jahne, M., Kanor, R., Katsivelis, P., Kuhn, K., Langan, L., Mansfeldt, C., McLellan, S., Grijalva, L., Murnane, K., Naughton, C., Pakman, A., Paraskevopoulos, S., Radniecki, T., Roman, F., Shrestha, A., Stadler, L., Steele, J., Swalla, B., Vikesland, P., Wartell, B., Wilusz, C., Wong, J., Boehm, A., Halden, R., Bibbly, K., & Vela, J. D. **2021**. Standardizing data reporting in the research community to enhance the utility of open data for SARS-CoV-2 wastewater surveillance. *Environmental Science: Water Research & Technolog*y, 7(9), 1545-1551.

Mansfeldt, C., Deiner, K., Mächler, E., Fenner, K., Eggen, R., Schönenberger, U., Johnson, D., Walser, J., and Altermatt, F. **2020**. Bacterial community shifts in streams receiving treated wastewater effluent. *Science of the Total Environment.* 709, p.135727. DOI:10.1016/j.scitotenv.2019.135727

Achermann, S., Mansfeldt, C., Johnson, D., and Fenner K. **2019**. Relating metatranscriptomic profiles to the micropollutant biotransformation potential of complex microbial communities. *Environmental Science & Technology.* 54.1: 235-244. DOI:10.1021/acs.est.9b05421

Mansfeldt, C., Achermann, S., Men, Y., Walser, J., Villez, K., Joss, A., Johnson, D., and Fenner, K. **2019**. Microbial residence time is a controlling parameter of the taxonomic and functional-enzyme composition of microbial communities. *ISMEJ*. 13(6), 1589. DOI: 10.1038/s41396-019-0371-6

Heavner, G., Mansfeldt, C., Wilkins, M., Nicora, C., Debs, G., Edwards, E., & Richardson, R. **2019**. Detection of organohalide-respiring enzyme biomarkers at a bioaugmented TCE-contaminated field site. Frontiers in Microbiology, 10.

Achermann, S., Falås, P., Joss, A., Mansfeldt, C., Men, Y., Vogler, B., & Fenner, K. **2018**. Trends in micropollutant biotransformation along a solids retention time gradient. *Environmental Science & Technology*. 52(20):11601–11611. DOI:10.1021/acs.est.8b02763

Achermann, S., Bianco, V., Mansfeldt, C., Vogler, B., Kolvenbach, B., Corvini, P., & Fenner, K. **2018**. Biotransformation of sulfonamide antibiotics in activated sludge: The formation of pterin-conjugates leads to sustained risk. *Environmental Science & Technology*, 52(11):6265-6274. DOI:10.1021/acs.est.7b06716

Heavner, G., Mansfeldt, C., Debs, G., Hellerstedt, S., Rowe, A., & Richardson, R. **2018**. Biomarkers' responses to reductive dechlorination rates and oxygen stress in bioaugmentation culture KB-1™. *Microorganisms*, 6(1):13. DOI:10.3390/microorganisms6010013

Richter, L., Mansfeldt, C., Kuan, M., Cesare, A., Menefee, S., Richardson, R., & Ahner, B. **2018**. Altered microbiome leads to significant phenotypic and transcriptomic differences in a lipid accumulating chlorophyte. *Environmental Science & Technology*, 52 (12):6854–6863. DOI:10.1021/acs.est.7b06581.

Mansfeldt, C., Richter, L., Ahner, B., Cochlan, W., & Richardson, R. **2016**. Use of de novo transcriptome libraries to characterize a novel oleaginous marine Chlorella species during the accumulation of triacylglycerols. *PloS One*, 11(2). DOI:10.1371/journal.pone.0147527

Mansfeldt, C., Heavner, G., Rowe, A., Hayete, B., Church, B., & Richardson, R. **2016**. Inferring gene networks for strains of *Dehalococcoides* highlights conserved relationships between genes encoding core catabolic and cell-wall structural proteins. *PloS One*, 11(11). DOI:10.1371/journal.pone.0166234

Mansfeldt, C., Logsdon, B., Debs, G., & Richardson, R. **2015**. SPINE: SParse eIgengene NEtwork linking gene expression clusters in Dehalococcoides mccartyi to perturbations in experimental conditions. *PloS One*, 10(2). DOI:10.1371/journal.pone.0118404.

Rowe, A., Mansfeldt, C., Heavner, G., & Richardson, R. **2015**. Relating mRNA and protein biomarker levels in a *Dehalococcoides* and *Methanospirillum*-containing community. *Applied Microbiology and Biotechnology*, 99(5): 2313-2327. DOI:10.1007/s00253-014-6220-7.

Mansfeldt, C., Rowe, A., Heavner, G., Zinder, S., & Richardson, R. **2014**. Meta-analyses of transcriptomic profiles of *Dehalococcoides mccartyi* strain 195 identify a respiration rate-related gene expression transition point and inter-operon recruitment of a key oxidoreductase subunit. *Applied & Environmental Microbiology*, 80(19):6062-6072. DOI:10.1128/AEM.02130-14.

Heavner, G., Rowe, A., Mansfeldt, C., Pan, J., Gossett, J., & Richardson, R. **2013**. Molecular biomarker-based biokinetic modeling of a PCE-dechlorinating and methanogenic mixed culture. *Environmental Science & Technology*, 47(8):3724-3733. DOI:10.1021/es303517s.

Rowe, A., Mansfeldt, C., Heavner, G., & Richardson, R. **2012**. *Methanospirillum* respiratory mRNA biomarkers correlate with hydrogenotrophic methanogenesis rate during growth and competition for hydrogen in an organochlorine-respiring mixed culture. *Environmental Science & Technology*, 47(1):372-381. DOI:10.1021/es303061y.

Rowe, A., Heavner, G., Mansfeldt, C., Werner, J., & Richardson, R. **2012**. Relating chloroethene respiration rates in *Dehalococcoides* to protein and mRNA biomarkers. *Environmental Science & Technology*, 46(17):9388-9397. DOI:10.1021/es300996c.

PATENTS:

Application No. 63/236,877. August 25, **2021**. *Mobile Continuous Low-Flow Liquid Sample Collection System.* VP CU File No. CU5666B-PPA1

EXTERNAL FUNDING

Environmental Protection Agency Early Career Award EPA-G2020-STAR-C2, Early Career: Assessment Tools for Biotechnology Products. Project Title: *EcoGenoRisk : Identifying Potential Ecological Risks Posed by a Novel Genome*. 07/01/2021-06/30/2024 $337,616