

**CRESTEN MANSFELDT**

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

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## **MAIN RESEARCH GOALS/EXPERTISE**

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- **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**

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- 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**

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- 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

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- 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

## AWARDS & EDUCATIONAL GRANTS

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- 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

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- 2019-Current      **University of Colorado - Boulder**  
 Spring 2020      CVEN 4834/5544 – Solid Waste  
 Fall 2019        CVEN 5484 – Applied Microbiology and Toxicology
- 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

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#### **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

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2016-2019	<b>Vice Chair</b> Vote-from-Abroad, Democrats Abroad Switzerland Chapter
2018	<b>Discussion Panelist Member</b> Kantonsschule Wohlen
2011-2013	<b>Seminar Committee Member</b> Cornell University Biogeochemistry, Environmental Science, and Sustainability Graduate Student Association (BESS)
2012	<b>Small Grant Review Board Member</b> Cornell University BESS
2007-2012	<b>Civil and Environmental Engineering Representative</b> Cornell University Graduate and Professional Student Assembly (CU GPSA)
2011-2012	<b>Provost's NYC Tech Campus Graduate Advisory Committee Member</b>
2010-2011	<b>President, CU GPSA</b>
2009-2010	<b>Student Advocacy Chair, CU GPSA</b>
2008-2010	<b>Faculty Senate Liaison, CU GPSA</b>
2009-2010	<b>Student Advocacy Chair, CU GPSA</b>
2009-2010	<b>Childcare Subcommittee Member</b> Cornell University
2008-2009	<b>Cornell Campus Planning Committee Member</b> Cornell University
2008-2010	<b>Social Chair</b> Cornell University, Civil and Environmental Engineering GSA
2010	<b>Expanding Your Horizons Volunteer</b> Cornell University
2005-2007	<b>Undergraduate Peer Advisor</b> University of Minnesota
2006-2007	<b>Tau Beta Pi Engineering Honors Society Treasurer</b> University of Minnesota

### CONFERENCE ORGANIZATION

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2010:	<b>Cornell Engineering Research Conference (CERC)</b>
2010:	<b>Ithaca Ignite</b>

### PEER REVIEWING ACTIVITIES

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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

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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

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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 Dehalococcoides species in mixed culture.* Poster Presentation. June 16-19, **2012**. American Society of Microbiology General Meeting. San Francisco, California, United States of America.

## PUBLICATIONS

- Achermann, S., Mansfeldt, C., Johnson, D., and Fenner K. 2020. Metatranscriptomic profiles describes micropollutant biotransformation potential of complex microbial communities. *Environmental Science & Technology*. In Press.
- 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*. In Press.
- 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.
- 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., Meneff, 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 elgengene 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.