KATHRYN B. NEWHART

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EDUCATION

Doctor of Philosophy 2018 - 2020
Civil and Environmental Engineering *Colorado School of Mines, Golden, CO*

· Dissertation: "Data-driven process control of municipal wastewater treatment"
· Advisors: Prof. Tzahi Cath and Prof. Amanda Hering (Baylor University)

Master of Science 2016 - 2018
Civil and Environmental Engineering *Colorado School of Mines, Golden, CO*

Bachelor of Science 2013 - 2016
Environmental Engineering *Colorado School of Mines, Golden, CO*

PROFESSIONAL EXPERIENCE

United States Military Academy at West Point June 2021 - Present
Assistant Professor of Environmental Engineering *West Point, NY*

· Teach *Environmental Engineering for Sustainable Development*, *Environmental Engineering Design*
· Course direct *Introduction to Environmental Engineering*, *Physical and Chemical Treatment*
· Support 3 undergraduate cadets in independent research
· Mentor underrepresented senior-level cadets in applying to graduate fellowships
· Department representative for Superitendents Civilian Faculty Advisory Council (Spring 2022)

Metro Wastewater Reclamation District March 2020 - May 2021
Technology & Innovation Engineer Associate *Denver, CO*

· Lead of *Data Utilization and Integration Focus Area*: Evaluate, design, and optimize data-driven business decision-making and process monitoring and control
· PAA Researcher: Develop data-driven chemical dose control for peracetic acid (PAA)

Colorado School of Mines May 2016 - August 2020
Research and Teaching Assistant *Golden, CO*

· Operator of a demonstration-scale sequencing-batch membrane bioreactor to support potable and nonpotable reuse research
· Co-instruct *Unit Processes for Water and Wastewater Treatment*, *Advanced Water Treatment and Reclamation*, *Field Session for Environmental Engineering*

PUBLICATIONS

Newhart, K.B., Hering, A.S., Cath, T.Y., "Data science tools to enable decarbonized water and wastewater treatment systems." *Pathways to Water Sector Decarbonization, Carbon Capture and Utilization*, edited by Z. Jason Ren and Krishna Pagilla, IWA Publishing, 2022.

Newhart, K.B., Goldman-Torres, J., Wisdom, B. Freedman, D., Hering, A.S., Cath, T.Y., "Real-time dose control of peracetic acid disinfection in municipal wastewater treatment," *ACS EST Water*, 2021, 1, 2, 328–338

Newhart, K.B., Marks, C.A., Rauch-Williams, T., Cath, T.Y., Hering, A.S. "Hybrid statistical-machine learning ammonia forecasting in continuous activated sludge treatment for improved process control," *Journal of Water Process Engineering*, 2020, 37, 101389

Klanderman, M., **Newhart, K.B.**, Cath. T.Y., Hering, A.S., "Fault isolation for a complex decentralized wastewater treatment facility," *Journal of the Royal Statistical Society*, Series C., 2020, 69, 931-951.

Newhart, K.B.., Holloway, R.W., Hering, A.S., Cath, T.Y., "Data-driven performance analyses of wastewater treatment plants: A review," *Water Research*, 2019, 157, 498-513

Odom, G.J., **Newhart, K.B.**, Cath, T.Y., Hering, A.S., "Multi-state multivariate statistical process control," *Applied Stochastic Models in Business and Industry*, 2018, 34(6), 880-892

Bell, E.A., Poynor, T.E., **Newhart, K.B.**, Regnery, J., Coday, B.D., Cath, T.Y., "Produced water treatment using forward osmosis membranes: evaluation of extended-time performance and fouling," *Journal of Membrane Science*, 2017, 525, 77-88.

RESEARCH

Note: Federal law heavily restricts research funding from outside agencies. Select federal funding agencies do not allow federal employees to be listed as PI's or co-PI's (e.g., US EPA). Therefore, PI is noted when scope is performed and participation is noted when only support is provided.

"Crossing the Finish Line: Integration of Data-Driven Process Control for Maximization of Energy and Resource Efficiency in Advanced Water Resource Recovery Facilities," U.S. Department of Energy, Research and Development for Advanced Water Resource Recovery Systems. DE-FOA-0002336. Awarded 2021. Total award $2,400,000. Principal Investigator at West Point.

"Data-driven Fault Detection and Process Control for Potable Reuse with Reverse Osmosis," National Alliance for Water Innovation, Autonomous Water and Precision Separations. NAWI-2-2021. Awarded 2021. Principal Investigator at West Point.

SELECT CONFERENCE PRESENTATIONS

"Predictive Control in Wastewater Treatment Facilities Using Simple Statistical Models," South Platte Coalition for Urban River Evaluation: Confluence at the Confluence, Oct 15, 2019, Englewood, CO

"Energy Reduction in Municipal Wastewater Treatment," Colorado Industrial Pretreatment Coordinators Association Fall Conference, Oct 18, 2019, Black Hawk, CO

"Predictive Modelling and Performance Assessment of Ammonia-Based Aeration Control," Water Environment Federation Technical Exhibition and Conference (WEFTEC), Sept 23, 2019, Chicago, IL

"A Utility Perspective: Practical Considerations of Operating and Advancing Ammonia-Based Aeration Control," July 10, 2019, RMWEA Innovation Seminar, Denver, CO

"Fault Detection Using PCA at a Municipal Wastewater Treatment Facility," July 30, 2019, Joint Statistical Meeting, Denver, CO

"Performance Evaluation of a Sequencing Batch Membrane Bioreactor Using Principal Component Analysis," Annual WateReuse Symposium, Sept 11, 2017, Phoenix, AZ

"Use of Principal Component Analysis for Early-Fault Detection in a Pilot-Scale Biological Wastewater Treatment System," Quality and Productivity Research Conference, June 14, 2017, Storrs, CT

WORKSHOP ORGANIZATION AND PARTITICPATION

"Visualization, Analysis, and Modeling in R for the Water Professional" MoWaTER PRO: Data Science Workshop, December 2021, Develop, organize, and present

"Machine Learning in the Water Industry" *WEF Innovations in Process Engineering*, June 8, 2021, Organize and present

"A Hypothetical – Potable Reuse Moves Towards Artificial Intelligence," *36th Annual WateReuse Symposium*, March 1, 2021, Panelist

"Understanding and Embracing Machine Learning, Artificial Intelligence and Predictive Analytics," *AWWA/SWAN International Smart Water Symposium*, November 10, 2020, Facilitator and presenter

"Data Research Advances Water Industry," *NSF Mid-scale Research Infrastructure Workshop for Intelligent Water Systems*, August 25, 2020, Virtual, Facilitator and presenter

LEADERSHIP ROLES

Department representative, Faculty Council, USMA, January 2022 – present

Member, AWWA Water Science & Research Division, Information Management & Technology, 2021 – present

President, NSF ReNUWIt Engineering Research Center Student Leadership Committee, 2018 – 2019

President, CSM Campus Chapter of the Rocky Mountain Section of the American Water Works Association (RMSAWWA)/Rocky Mountain Water Environment Association (RMWEA), 2018 – 2019

Co-Chair, 15th Annual RMSAWWA/RMWEA Joint Student Conference, 2018

AWARDS

WEF/WRF LIFT Intelligent Water System Challenge, 1st place, 2019

AWRA-Colorado Rich Herbert Memorial Scholarship, 2019

CERTIFICATIONS

Wastewater Operator, Class D, Colorado, 2016-2024

Fundamentals of Engineering (FE), Environmental, Colorado, NCEES ID 16-475-7