KATHRYN B. NEWHART

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PROFESSIONAL EXPERIENCE

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

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

Red Rocks Community College — August 2020 - December 2020
Water Quality Management Instructor — *Lakewood, CO*

Colorado School of Mines — May 2016 - May 2019
Teaching and Research Assistant — *Golden, CO*

AFFILIATED INSTITUTIONS

Baylor University — 2023 - Present
Graduate School, Department of Statistical Science — *Waco, TX*

Colorado School of Mines — 2020 - Present
Department of Civil and Environmental Engineering — *Golden, CO*

Teaching experience

Institution	*Course*	*Title (Credit Hours)*	*Semesters*
USMA	EV201[1]	Introduction to Environmental Engineering (3)	1
USMA	EV401[1]	Physical and Chemical Treatment (3.5)	3
USMA	EV450[2]	Environmental Engineering for Sustainable Development (3)	3
USMA	EV490/491[2]	Environmental Engineering Design (Capstone) (3)	5
USMA	XE365[3]	Advanced Experimental Methods & Data Processing (3)	1
RRCC	WQM42[1]	Water Data Management & Analysis (3)	1
CSM	CEE 470/570[3]	Unit Processes for Water and Wastewater Treatment (3)	3
CSM	CEE 471/571[3]	Advanced Water Treatment and Reclamation (3)	1
CSM	CEE 330[3]	Field Session for Environmental Engineering (3)	3

[1] Course director, [2] Instructor, [3] TA / Guest lecturer

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*

PUBLICATIONS

12. Black, A., **Newhart, K.**, Linvill, C., Pytlar, A., Galaitsi, S., Fairfield;, C., Wait, M., Bennett, E., Butkus, M., "Examination of the water-energy nexus: linguistic analysis of energy terminology in the wastewater literature," *Jounrnal of Environmental Management*, 2023, *in review.*

11. Grimm, T.R., **Newhart, K.B.** and Hering, A.S.,"Nonparametric Threshold Estimation of Autocorrelated Statistics in Multivariate Statistical Process Monitoring," *Quality and Reliability Engineering International*, 2023, *in review.*

10. **Newhart, K.B.**, Klanderman, M.C., Hering, A.S., Cath, T.Y., "A holistic evaluation of multivariate statistical process monitoring in a biological and membrane treatment system," *ACS ES&T Water*, 2023, DOI: 10.1021/acsestwater.3c00058

9. Martin, M., Goethals, P., **Newhart, K.**, Rhodes, E., Vogel, J., Stevenson, B., "Optimization of sewage sampling for wastewater-based epidemiology through stochastic modeling." *J. Eng. Appl. Sci*, 2023, 70, 11.

8. **Newhart, K.B.**, Pfluger, A.R., Butkus, M.A., "The Green Escape Room: Part 2 – Teaching Students Professional Engineering Ethics by Applying Environmental Engineering Principles and Deciphering Clues and Puzzles." Paper presented at *2022 ASEE Annual Conference & Exposition*, Minneapolis, MN, 2022.

7. **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.

6. **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 ES&T Water*, 2021, 1, 2, 328–338

5. **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

4. 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.

3. **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

2. 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

1. 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.

NON-REFEREED PUBLICATIONS

Weintraut, Z., **Newhart, K.**, Thoompson, K., Roostaei, J., "Are you ready for big data? A checklist for readiness for data analytics in water utilities," *Journal AWWA*, 2022, 114, 10, 78-82

Newhart, K.B. & Avila, I., "NDMA: relevance and regulatory status for drinking water facilities," *Rocky Mountain Water*, November 2017

RESEARCH

Note: Federal law restricts participation and funding from federal agencies outside of the Department of Defense.

"Unlocking the Nationwide Potential of Water Reuse," U.S. Environmental Protection Agency, National Priorities: Water Innovation, Science, and Engagement to Advance Water Reuse. EPA-G2021-ORD&EI. Awarded 2023. Total award $4,000,000. Research Partner 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 2022. Total award $1,034,000. Principal Investigator at West Point.

"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.

SELECT CONFERENCE PRESENTATIONS

"Prediction of Post-Secondary E. coli for Disinfection Control: Application of statistical and machine learning algorithms." WEF/IWA Innovations in Process Engineering, June 9, 2023, Portland, OR

"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 Modeling 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

WORKSHOPS

"Defining Pathways for Solving Environmental Challenges using Machine Learning" *AEESP Annual Conference*, 2023, Organizer

"A Convergence of WRF Machine Learning Based Controller Implementation and Research" *WEF/IWA Innocations in Process Engineering*, June 6, 2023, Facilitator and presenter

"Visualization, Analysis, and Modeling in R for the Water Professional" MoWaTER PRO: Data Science Workshop, 2021 & 2022, Organizer

"Machine Learning in the Water Industry" *WEF/IWA Innovations in Process Engineering*, June 8, 2021, Organizer

"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

INVITED TALKS

"Artificial Intelligence in the Water Industry" Orange County Water District, August 1, 2023

"Understanding and Embracing Machine Learning, Artificial Intelligence and Predictive Analytics" Metropolitan Water Reclamation District of Greater Chicago, June 30, 2023

LEADERSHIP AND SERVICE ROLES

Chair, National Water Research Institute (NWRI) Independent Expert Panel, supporting *Data-Driven Fault Detection and Process Control for Potable Reuse with Reverse Osmosis Project*

Editorial Advisory Team, ACS Environmental Science & Technology Water

Referee, ACS Environmental Science & Technology Engineering; Environmental Science: Water Research & Technology; Resources, Conservation & Recycling; Water Environment Research; Water Research (IWA)

Technology Reviewer, Water Research Foundation TechLink, January 2022 – present

Department representative, Superitendent's Civilian Faculty Advisory Council, USMA, January 2022 – May 2022

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

PROFESSIONAL MEMBERSHIPS

American Society of Engineering Education

American Chemical Society

National Center for Faculty Development and Diversity

Water Environment Federation

IN THE NEWS

Newhart, K. B., Marks, C., Rauch-Williams, T., Cath, T. Y., Hering, A. S. (2020) "Boulder tests its waters with predictive aeration control," Advances in Water Research, 30: 25–28. URL.

AWARDS

ASEE Environmental Engineering Division Early Career Award, 2022

ACS Publications Peer Reviewer, Certificate of Recognition, 2022

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