

Daniel B. Gingerich
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Research Interests: Water Infrastructure; Environmental Decision Making; Energy-Water Nexus

EDUCATION

Carnegie Mellon University, Pittsburgh, PA (2013-2017)

Ph.D. in Engineering and Public Policy

Thesis Title: Evaluating and Avoiding Risk Tradeoffs in Water Treatment

Thesis Committee: Meagan S. Mauter (Chair), Jared L. Cohon, David A.

Dzombak, M. Granger Morgan

Auburn University, Auburn, AL (2011-2013)

M.S. in Civil and Environmental Engineering – Environmental Engineering Focus

Mississippi State University, Starkville, MS (2006-2011)

B.S. in Civil Engineering

B.A. in Political Science

EMPLOYMENT

Assistant Professor, Ohio State University (*January 2020 - Present*)

Department of Civil, Environmental and Geodetic Engineering (70% appointment)

Department of Integrated Systems Engineering (30% appointment)

Core Faculty, The Sustainability Institute

Affiliated Faculty, Environmental Science Graduate Program

Post-Doctoral Research Associate, Stanford University (*September 2019-December 2019*)

Department of Civil and Environmental Engineering

ORISE Postgraduate Research Fellow, National Energy Technology Laboratory (*May 2018-December 2019*)

Post-Doctoral Research Associate, Carnegie Mellon University (*Sept 2017 - August 2019*)

Department of Civil and Environmental Engineering (*Sept 2017 – August 2019*)

ORISE Intern, National Energy Technology Laboratory (*May 2017 – September 2017*)

Graduate Research Assistant, Carnegie Mellon University (*Aug 2013 – Aug 2017*)

Department of Engineering and Public Policy

Policy Intern, American Water Works Association (*May 2015 – Aug 2015*)

Graduate Research Assistant, Auburn University (*August 2011 - August 2013*)

Department of Civil and Environmental Engineering

PUBLICATIONS

**Indicates student mentored.*

12. Gingerich, D.B. and Mauter, M.S. Flue gas desulfurization wastewater composition and implications for regulatory and treatment train design. *Environmental Science & Technology*, **2020**, 54(7), 3783-3792.

11. Gingerich, D.B.; Zhao, Y.*; Mauter, M.S. Environmentally significant shifts in trace element emissions from coal plants complying with the 1990 Clean Air Act Amendments, *Energy Policy*, **2019**, 132, 1206-1215.

10. Sun, X.; Gingerich, D.B.; Azevedo, I.L.; Mauter, M.S. Trace element mass flow rates from U.S. coal fired power plants, *Environmental Science & Technology*, **2019**, 53(10), 5585-5595.
9. Gingerich, D.B.; Grol, E.; Mauter, M.S. Fundamental Challenges and Engineering Opportunities in Flue Gas Desulfurization Wastewater Treatment at Coal Fired Power Plants, *Environmental Science: Water Research & Technology*, **2018**, 4(7), 909-925.
8. Gingerich, D.B.; Mauter, M.S., Redesigning the Regulated Power Plant: Optimizing Energy Allocation to Electricity Generation, Water Treatment, and Carbon Capture Processes at Coal-Fired Generating Facilities, *ACS Sustainable Chemistry & Engineering*, **2018**, 6 (2), 2694-2703.
7. Gingerich, D.B.; Bartholomew, T.V.; Mauter, M.S. Technoeconomic Optimization of Emerging Technologies for Regulatory Analysis, *ACS Sustainable Chemistry & Engineering*, **2018**, 6 (2), 2370-2378.
6. Gingerich, D.B.; Mauter, M.S., Air Emission Benefits of Biogas Electricity Generation at Municipal Wastewater Treatment Plants, *Environmental Science & Technology*, **2018**, 52 (3) 1633-1643.
5. Gingerich, D.B.; Mauter, M.S. Life-Cycle Air Emissions Damages for Municipal Drinking Water Treatment, *Environmental Science & Technology*, **2017**, 51 (18), 10299-10306.
4. Gingerich, D.B.; Aditi, A.; Barnett, M.O., Is the Arsenic Rule Affordable? *Journal American Water Works Association*, **2017**, 109 (9), E381-E392.
3. Gingerich, D.B.; Sun, X.; Behrer, A.P.; Azevedo, I.M.L.; Mauter, M.S., Spatially resolved air-water emissions tradeoffs improve regulatory impact analyses for electricity generation, *Proceedings of the National Academies of Science*, **2017**, 114 (8), 1862-1867.
2. Zhou, X.; Gingerich, D.B.; Mauter, M.S., Process Modeling of Forward Osmosis Systems Using Waste Heat from Electric Power Generation, *Industrial & Chemical Engineering Research*, **2015**, 54 (24), 6378-6389.
1. Gingerich, D.B.; Mauter, M.S., Quantity, Quality, and Availability of Residual Heat from the US Power Sector, *Environmental Science & Technology*, **2015**, 49 (14), 8297-8306.

CONFERENCE PRESENTATIONS

**Indicates student mentored.*

13. Gingerich, D.B.; Zhao, Y.*; and Mauter, M.S. *Implications of Market and Regulatory Drivers for Trace Element Emissions from Coal-Fired Power Plants*, AEESP Meeting, Tempe, AZ, 2019. **(Poster)**.
12. Gingerich, D.B. and Mauter, M.S. *Quantifying and Incorporating Air-Water Risk Trade-Offs in Water Decision Making*, AEESP Meeting, Tempe, AZ, 2019. **(Poster)**.
11. Gingerich, D. Bartholomew, T.; and Mauter, M., *Technoeconomic Optimization of Emerging Technologies for Regulatory Analysis: NH₄HCO₃ Forward Osmosis for Power Plant Wastewater Treatment*, AIChE Annual Meeting, Pittsburgh, PA, 2018 **(Poster)**.
10. Gingerich, D.; Mauter, M., *Air Emission Reduction Benefits of Biogas Electricity Generation at Wastewater Treatment Plants*. AIChE Annual Meeting, Pittsburgh, PA, 2018. **(Platform)**.
9. Gingerich, D.; Zhao, Y.*; Grol, E.; and Mauter, M., *Quantifying Shifts in Trace Element Emissions from Coal-Fired Power Plants*, AIChE Annual Meeting, Pittsburgh, PA, 2018. **(Platform)**.

8. Gingerich, D.; Mauter, M. *Redesigning the Regulated Power Plant: Optimizing Energy Allocation to Electricity Generation, Carbon Capture, and Water Treatment Processes at Coal-Fired Power Plants*, AIChE Annual Meeting, Pittsburgh, PA, 2018. (**Platform**).
7. Gingerich, D.; Bartholomew, T.; Mauter, M., *Technoeconomic Optimization of Waste Heat Driven Forward Osmosis for Flue Gas Desulfurization Wastewater Treatment*, ASME Power Conference, Charlotte, NC, 2017 (**Platform**).
6. Gingerich, D. and Mauter, M., *Retrofitting the Regulated Power Plant*, AEESP Meeting, Ann Arbor, MI, 2017 (**Platform**).
5. Gingerich, D. and Mauter, M., *Air-water emission tradeoffs for six drinking water rules*, AEESP Meeting, Ann Arbor, MI, 2017 (**Poster**).
4. Gingerich, D.; Sun, X.; Behrer, A.P.; Azevedo, I.; Mauter, M., *Air Emission Implications of Expanded Wastewater Treatment at Coal-Fired Generators*, ACS Fall Meeting, Philadelphia, PA, 2016 (**Platform**).
3. Gingerich, D.; Mauter, M., *Water Treatment Capacity Utilizing Power Plant Waste Heat Driven Forward Osmosis*, Technology, Management and Policy Consortium, Pittsburgh, PA, 2015 (**Platform**).
2. Gingerich, D.; Mauter, M., *Evaluation of the Techno-Economic Feasibility of Waste-Heat Driven Water Treatment at Electric Power Generation Facilities*, AEESP Meeting, New Haven, CT, 2015 (**Platform**). **Presentation Award**.
1. Gingerich, D.; Barnett, M., *Incorporation of Income Distribution Into the EPA's Affordability Metrics*. AWWA Conference & Exposition, Denver, CO, 2013 (**Platform**).

SOFTWARE DEVELOPED

2. Water Associated Health and Environmental Damages (Water AHEAD). doi: 10.17605/osf.io/p28ax.
1. Contaminant behavior in Air, Liquids, and Solids Controls (COALS Controls). doi: 10.17605/osf.io/6rfre8.

RESEARCH FUNDING

Active Projects (Actual/Anticipated Expenditures in Parentheses)

1. OSU Office of Research. "Evaluating Job Creation from COVID-19 Economic Recovery Infrastructure Investments" PI: Gingerich, D. Co-PIs: Qin, Y.; Bielicki, J. Total Award: \$4,396 (\$2694)

Pending Projects

1. National Alliance for Water Innovation. "Supporting Development of the Water Techno-economic Assessment and Pipe Parity Platform Tool." PI: Gingerich, D. Total Award without cost share: \$47,268

HONORS AND AWARDS

Carnegie Mellon University

- Phillips and Huang Family Foundation Fellowship (2015-2016)
- Achievement Rewards for Collegiate Scientists (2013-2016)
- Steinbrenner Institute Graduate Fellowship (2014-2015)

Auburn University

- William G. Martin Graduate Fellowship in Civil Engineering (2011-2012)

Mississippi State University

Political Science Outstanding Undergraduate Student (2011)
Mississippi Engineering Society Scholarship (2011)
Bagley College of Engineering Outstanding Senior (2010-2011)

TEACHING ACTIVITIES

Teaching Assistant Assignments

Stanford University: CE 275D *Environmental Policy Analysis* (Fall 2019)
Carnegie Mellon University: 06-365/19-365 *Water Technology Innovation & Policy* (Spring 2015)
Auburn University: CIVL 3220 *Water & Wastewater Treatment Laboratory* (Spring 2012-Summer 2013); CIVL 3230 *Introduction to Environmental Engineering Laboratory* (Spring 2012-Summer 2013)

Guest Lectures

Carnegie Mellon University: 12-351 *Environmental Engineering* (Spring 2017 and 2018);
06-365/19-365 *Water Technology Innovation & Policy* (Spring 2014)

STUDENTS MENTORED

Master's Students

Liu, Jiachen (M.S. in Energy, Science, Technology & Policy at Carnegie Mellon University)

Undergraduate Students

Curren, David (B.S. in Computer Science at The Ohio State University)
Townsend, Rebecca (B.S. in Environmental Engineering at The Ohio State University)
Gardner, Jacob (B.S. in Civil Engineering at The Ohio State University)
Zhao, Yifan (B.S./M.S. in Civil & Environmental Engineering at Carnegie Mellon University)

UNIVERSITY SERVICE

Carnegie Mellon University

University Leadership Student Advisory Council (2016-2017)
Task Force on the CMU Experience Health & Wellbeing Working Group (2016-2017)
Graduate Student Assembly (2014-2017)
President (2016-2017)
Vice President of External Affairs (2015-2016)
Representative (2014-2015)

PROFESSIONAL LEADERSHIP AND SERVICE

Professional Societies

American Chemical Society (ACS)
Association of Environmental Engineering and Science Professors (AEESP)
American Association for the Advancement of Science (AAAS)
Tau Beta Pi Engineering Honors Society (TBP)
Chi Epsilon Civil Engineering Honors Society
Pi Sigma Alpha Political Science Honors Society

Outreach Activities

Summer Center for Climate, Energy and Environmental Decision Making, Center for
Climate and Energy Decision Making, 2014, 2015, 2016, 2017, 2018, 2019

EXPERT AND PEER REVIEW

Journals

Energies (2)

Water (2)

Applied Sciences (1)

ChemEngineering (1)

Clean - Soil, Air, Water (1)

Environmental Pollution (1)

RSC Advances (1)