Mark D. Rowe

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EDUCATION

Michigan Technological University (Houghton, MI) **2004-2009**

Ph.D. in Environmental Engineering
Dissertation: *Development of measurement and modeling tools to quantify atmospheric deposition of persistent, bioaccumulative and toxic chemicals in the Great Lakes*
Cumulative grade point average: 4.0/4.0

M.S. in Environmental Engineering
Thesis: *Modeling contaminant behavior in Lake Superior: A comparison of PCBs, PBDEs, and mercury*
Cumulative grade point average: 4.0/4.0
Graduate Certificate in Sustainability

Colorado School of Mines (Golden, CO) **1997-1999**

M.S. in Metallurgical and Materials Engineering
Thesis: *The effect of ferro-alloy additions and depth on the quality of underwater wet welds*
Cumulative grade point average: 4.0/4.0

The Ohio State University (Columbus, OH) **1992-1997**

B.S. in Welding Engineering
Welding Engineering at OSU is an ABET accredited interdisciplinary engineering program that covers theory and application of materials science, electrical engineering, structural design, and manufacturing, in addition the core math, chemistry, physics, and liberal arts education requirements common to all engineering programs.
Undergraduate Thesis: *Hydrogen-induced cracking along the fusion boundary of dissimilar metal welds*
Magna Cum Laude: 3.7/4.0 GPA **With Distinction:** undergraduate research thesis
Passed the Fundamentals of Engineering Exam in the State of Ohio (1997)

PROFESSIONAL EXPERIENCE

National Oceanic and Atmospheric Administration / Great Lakes Environmental Research Laboratory, NOAA GLERL (Ann Arbor, MI) **2013-pres.**

National Research Council Postdoctoral Fellow

- Developing linked physical and biological models to simulate the impacts of invasive dreissenid mussels on the lower food web and nutrient cycling in Lake Michigan.
- Collaborating with others to write proposals for internal and external funding.
- Participating in the Lake Michigan Modeling Coordinating Council and the Lake Michigan Monitoring Coordinating Council.
- Mentored an undergraduate student in the Great Lakes Summer Student Fellowship Program at NOAA GLERL (Statistical analysis of chlorophyll data in Lake Michigan).

U.S. Environmental Protection Agency / Large Lakes Research Station **2010-2013**
(Grosse Ile, MI)

Postdoctoral Fellow

- Modeled primary production of the lower food web in Lake Michigan, including effects of nutrient loads and invasive mussels.
- Developed models with multidisciplinary collaborators to predict effects of projected land use change due to biofuels production targets on provision of aquatic ecosystem services in the Midwest and Great Lakes.

Michigan Technological University (Houghton, MI) **2004-2009**

Graduate Research Assistant

- Developed an atmospheric boundary layer model to simulate gas exchange fluxes of semivolatile organic compounds (PCBs, organochlorine pesticides, and PBDEs) in Lake Superior.
- Designed, fabricated, and characterized performance of a novel high-flow rate diffusion denuder for collection of trace atmospheric semivolatile organic chemicals (PCBs, organochlorine pesticides, and PBDEs) and associated thermal extraction and gas chromatography analysis methods.
- Developed a model to simulate concentrations of PCBs, PBDEs, and mercury in Lake Superior over time, and to estimate the relative importance of source and sink pathways.
- Wrote proposals for external funding.
- Participated in field work in Lake Superior during the 2004, 2005, 2006, and 2007 seasons aboard the Michigan Tech R/V Agassiz or US EPA R/V Lake Guardian.
- Taught "Fundamentals of Environmental Engineering" to 44 students, Fall semester 2008.
- Mentored groups of American and Bolivian undergraduate and graduate students in a research and educational program in Bolivia, where we designed and installed hydrologic instruments.
- Directly supervised and mentored four undergraduate students in laboratory and field work.
- Proposed a project and served as graduate student mentor for an NSF Research Experience for Undergraduates student from Puerto Rico in the Summer of 2007.

Haynes International Inc. (Kokomo, IN) **2000-2004**

Senior Engineer - Welding Metallurgist

- Performed materials selection and metallurgical failure analysis investigations for the power generation, chemical process, and aerospace industries.
- Managed several research and development projects.
- Obtained Department of Energy funding for use of atom probe tomography and thermo-mechanical testing equipment at Oak Ridge National Lab.
- Authored three peer-reviewed publications and fifty-five technical reports, and presented at three national conferences and a short-course.

Colorado School of Mines (Golden, CO) **1997-1999**

Graduate Research Assistant

- Developed novel coated electrode formulations for welding repair of subsea structures. Applied principles of chemistry and thermodynamics to minimize absorption of gases into weld metal at elevated temperature and pressure

Diamond Power Specialty Company (Lancaster, OH) **1994-1995**

Engineering Co-op

- Developed and evaluated new welding processes for manufacture of equipment for coal-fired power-generation plants.

Honors and Awards

- National Research Council postdoctoral fellowship at NOAA GLERL
- US EPA incentive awards for initiating collaboration with USGS and organizing a technical session at the IAGLR 2011 conference.
- Michigan Tech's nominee for the 2010 Council of Graduate Schools/University Microfilms International Distinguished Dissertation Award in the mathematics, physical sciences, and engineering division.
- National Science Foundation/Michigan Tech Scholarships – Science, Technology, Engineering, and Mathematics (S-STEM) program (2008-2009)
- National Science Foundation/Michigan Tech Sustainable Futures Institute Integrative Graduate Education and Research Traineeship (IGERT) program associateship (2008 - 2009)
- Restek Best Student Paper Award for "Thermal extraction and analysis of atmospheric semivolatile organic compounds from multicapillary collection devices" presented at Dioxin 2008, August 17-22, Birmingham, UK
- Pati Damoder & Soumitri Reddy Fellowship, Michigan Tech
- Best paper award for "Properties, weldability, and applications of modern, wrought, heat-resistant alloys for aerospace and power generation industries" presented at the International Gas Turbine and Aeroengine Congress and Exhibition, Vienna, Austria, June 13–17, 2004

Service and Outreach

Peer Review

Environmental Science & Technology, Chemosphere, Hydrobiologia, Journal of Great Lakes Research, Aquatic Ecosystem Health & Management.

NOAA GLERL

- Participated in the Lake Michigan Modeling Coordinating Council and the Lake Michigan Monitoring Coordinating Council.

US EPA

- Organized and co-chaired a technical session entitled Nutrients, Eutrophication, Hypoxia, and Harmful Algal Blooms at the 54th Conference of the International Association for Great Lakes Research, May 30-June 3, Duluth, MN.

Michigan Technological University

- Taught a six-week "After School Science" program in Chemistry to elementary school students through the Western U.P. Center for Science, Mathematics and Environmental Education.
- Served on a committee of the MTU chapter of Engineers Without Borders to determine feasibility of a community development project in the Dominican Republic.
- Volunteered in a community outreach program through the Western U.P. Center for Science, Mathematics and Environmental Education. I assisted local school children and families with identification of plankton from Portage Lake by optical microscopy.

Kokomo, Indiana

- Volunteered as Adopt-a-River program director for the Wildcat Guardians. Organized volunteers to remove trash from the creek on cleanup days, and encouraged section coordinators to conduct cleanups over 80 miles of the Wildcat Creek.
- Volunteered in the Job Shadow program for local high school students, gave presentations at Career Night for middle school students, and judged science fairs.

SKILLS

Software: Microsoft Office, Arc GIS, R (open source statistical programming language), Matlab, FORTRAN, Linux cluster high performance computing, CE-QUAL-ICM and WASP water quality models, USDA Soil and Water Assessment Tool (watershed model)
Languages: English (native), Spanish (intermediate level conversational)
Instrumental analysis: Agilient 6890 and 5890 gas chromatographs, Campbell Scientific eddy covariance system, LI-COR LI7500 open path CO_2/H_2O gas analyzer, aerosol particle measurement.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

International Association for Great Lakes Research, American Geophysical Union, Association of Environmental Engineering and Science Professors

Refereed Journal Articles

M.D. Rowe, J.J. Pauer,W. Melendez,R.G. Kreis Jr. 2013. Simulation of primary production and sediment nutrient recycling in a Lake Michigan water quality model: LM3-PP. Journal of Great Lakes Research, *in review*.

M.D. Rowe, R.G. Kreis Jr, D.M. Dolan. 2013. A reactive nitrogen budget for Lake Michigan. Journal of Great Lakes Research, http://dx.doi.org/10.1016/j.jglr.2013.11.005.

M. D. Rowe, J.A. Perlinger, C.W. Fairall. **2011**. Chemical sensor resolution requirements for near-surface measurements of turbulent fluxes. Atmospheric Chemistry and Physics. 11: 5263–5275. www.atmos-chem-phys.net/11/5263/2011/.

M. D. Rowe, J.A. Perlinger, C.W. Fairall. **2011**. A Lagrangian Model to Predict Modification of Near-Surface Scalar Mixing Ratios and Air-Water Exchange Fluxes in Offshore Flow. Boundary Layer Meteorology, 140(1): 87-103, DOI: 10.1007/s10546-011-9598-0.

M.D. Rowe, J.A. Perlinger. **2010**. Performance of a high-flow-rate, thermally-extractable diffusion denuder for atmospheric semivolatile organic compound concentration measurement**.** Environmental Science and Technology. 44:2098–2104. DOI: 10.1021/es903002k.

M.D. Rowe, J.A. Perlinger. **2010**. Prediction of collection efficiencies of gaseous and particle-associated semivolatile organic chemicals in multicapillary diffusion denuders. Journal of Chromatography A. 1217 (3) 256–263. DOI: 10.1016/j.chroma.2009.11.049.

M.D. Rowe, J.A. Perlinger. **2009**. Gas-phase cleanup method for analysis of trace atmospheric semivolatile organic compounds by thermal desorption from diffusion denuders. Journal of Chromatography A. 1216 (32): 5940-5948. DOI: 10.1016/j.chroma.2009.06.034.

M.D. Rowe. **2006**. Ranking the resistance of wrought superalloys to strain-age cracking. Welding Journal. 2006. 85(2): 27s-33s.

M.D. Rowe, V.R. Ishwar, D.L. Klarstrom. **2006**. Properties, weldability, and applications of modern, wrought, heat-resistant alloys for aerospace and power generation industries. Journal of Engineering for Gas Turbines and Power. 128(2):354-361.

M. D. Rowe, G. Hoback, P. Crook. **2003**. Weldability of a corrosion-resistant Ni-Cr-Mo-Cu alloy. Welding Journal. 82(11): 313s-320s.

M. D. Rowe, S. Liu, T. J. Reynolds. **2002**. The effect of ferro-alloy additions and depth on the quality of underwater wet welds. Welding Journal. 81(8): 156s-166s.

M. D. Rowe, S. Liu. **2001**. Recent developments in underwater wet welding. Science and Technology of Welding and Joining. 6(6): 387-395.

M. D. Rowe, T. W. Nelson, J. C. Lippold. **1999**. Hydrogen-induced cracking along the fusion boundary of dissimilar metal welds. Welding Journal. 78(2): 31s-37s.

Peer-Reviewed Book Chapter

M. D. Rowe, J.A. Perlinger, N.R. Urban. **2009**. Modeling contaminant behavior in Lake Superior: A comparison of PCBs, PBDEs, and mercury, *In:* State of Lake Superior, Ecovision World Monograph

Series, M. Munawar and I.F. Munawar (Eds.), Aquatic Ecosystem Health and Management Society. 239-286.

PATENTS

J.A. Perlinger and M.D. Rowe, Semivolatile organic chemical sampling and thermal extraction transfer method and apparati, U.S. Patent 8,485,020, filed November 26, 2008.

PROCEEDINGS

M.D. Rowe, J.A. Perlinger. **2008**. Thermal extraction and analysis of atmospheric semivolatile organic compounds from multicapillary collection devices. Organohalogen Compounds. 70: 38-41.

J.A. Perlinger, M.D. Rowe. **2008**. Atmospheric transport and air-water exchange of hexachlorobenzene in Lake Superior. Organohalogen Compounds. 70: 598-601.

PRESENTATIONS

M. D. Rowe, H. A. Vanderploeg, T. F. Nalepa. **2013**. Estimating the Spatial Distribution and Lakewide Biomass of Quagga Mussels in Lake Michigan from Point Observations. 2013 State of Lake Michigan and Great Lakes Beach Association Conference, October 15-17, Sheboygan, WI.

M. D. Rowe, J. Wang, H. A. Vanderploeg, E. J. Anderson, T. F. Nalepa, J. R. Liebig, S. A. Pothoven, T. H. Johengen, G. L. Fahnenstiel. **2013**. Simulating the Direct Impact of Dreissenid Mussel Grazing on Phytoplankton Concentration in Lake Michigan as a Function of Turbulence Parameterization. 56th Conference of the International Association for Great Lakes Research, June 2-6, West Lafayette, IN.

M. D. Rowe, J. J. Pauer, P.A. DePetro, and R. Kreis. **2012**. Modeling the Sensitivity of Primary Production in Lake Michigan to Nutrient Loads with and without Dreissenid Mussels. 55th Conference of the International Association for Great Lakes Research, May 13-17, Cornwall, Ontario, Canada.

M. D. Rowe, J. Pauer, R. Kreis, D. Dolan. **2011**. Modeling the Response of Nutrient Concentrations and Primary Productivity in Lake Michigan to Nutrient Loading Scenarios, 54th Conference of the International Association for Great Lakes Research, May 30-June 3, Duluth, MN.

M. D. Rowe, J. A. Perlinger, C.W. Fairall. **2009**. Application of an Internal Boundary Layer Transport Exchange Model to Micrometeorological Measurements of HCB and PCB Gas Transfer in Lake Superior, 51st Conference of the International Association for Great Lakes Research, May 18-22, Toledo, OH.

M.D. Rowe, J.A. Perlinger, C.W. Fairall. **2008**. Application of an internal boundary layer transport exchange model to gas transfer of semivolatile organic contaminants in Lake Superior, AGU 2008 Fall Meeting, American Geophysical Union, December 15-19, San Francisco, CA (poster).

M.D. Rowe, J.A. Perlinger. **2008**. Thermal extraction and analysis of atmospheric semivolatile organic compounds from multicapillary collection devices, Dioxin 2008, August 17-22, Birmingham, UK.

M. D. Rowe, D. E. Tobias, J. A. Perlinger. **2007**. Modeling the influence of atmospheric stability on air-water exchange of persistent bioaccumulative toxics in the Great Lakes, 50th Conference of the International Association for Great Lakes Research, May 28 – June 1, State College, PA.

M. D. Rowe, J. A. Perlinger. **2005**. Estimation of the relative importance of deposition and removal processes of PBDEs in Lake Superior**,** The 7th Annual Workshop on Brominated Flame Retardants in the Environment, June 13-14, Gaithersburg, MD.

M. D. Rowe, J. A. Perlinger. **2005**. Estimation of the relative importance of deposition and removal processes of PBDEs in Lake Superior**,** 48th Conference of the International Association for Great Lakes Research, May 23 – 27, Ann Arbor, MI.

M. D. Rowe, J. A. Perlinger. **2004**. Estimation of the influence of aerosol size distribution on PBDE dry deposition to Lake Superior**,** 27th Midwest Environmental Chemistry Workshop, October 15-17, Madison, WI (poster).

Presented at six national conferences in the field of metallurgical and materials engineering (American Welding Society and ASM International 1998-2003).