

## Carrie A. McDonough, Ph.D., Postdoctoral Fellow

Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

### RESEARCH INTERESTS AND OBJECTIVES

---

- Connecting water quality to public health issues by working at the intersection of environmental organic chemistry and molecular toxicology
- Using high-resolution mass spectrometry to measure fluorochemicals and other trace organic contaminants in water, biological fluids, and tissues
- Applying innovative environmental monitoring and bioanalytical techniques to study exposure pathways, bioaccumulation, and integrated biological effects of organic contaminants in aquatic environments

### EDUCATION

---

#### Massachusetts Institute of Technology

B.Sc., Chemistry, June 2008; Advisor: John Essigmann; GPA: 4.2/5.0

#### University of Rhode Island Graduate School of Oceanography

Ph.D., Oceanography, May 2017; Advisor: Rainer Lohmann; GPA: 4.0/4.0

### PROFESSIONAL HISTORY

---

#### Colorado School of Mines, Department of Civil & Environmental Engineering, Golden, CO

Postdoctoral Fellow, Higgins Lab June, 2017 - present

Project 1: Characterizing profiles of per- and polyfluoroalkyl substances (PFASs) and their internal breakdown products in serum and urine from dosed mice exposed to aqueous film-forming foam (AFFF)

Project 2: Identifying endogenous biomarkers in serum from mice exposed to AFFF using liquid chromatography and quadrupole-time-of-flight-mass spectrometry (LC-QToF-MS)-based metabolomics

Project 3: Characterizing profiles of PFASs and their biotransformation products in serum and drinking water from residents from Colorado Spring communities with AFFF-impacted drinking water

Project 4: Development and utilization of high-resolution mass spectrometry (HRMS) fragmentation libraries for nontarget screening of surface water and drinking water for AFFF-associated PFASs

#### University of Rhode Island Graduate School of Oceanography, Narragansett, RI

Teaching Assistant, Oceanographic Sciences January - May, 2014

Graduate Student Research Assistant July, 2012 - June, 2017

Project 1: Investigating spatial distributions and air-water exchange of hydrophobic organic contaminants (HOCs) in the Great Lakes region using polyethylene passive samplers

Project 2: Measuring bioaccumulation and biomagnification of synthetic fragrances and halogenated flame retardants in a Passaic River food web

Project 3: Coupling passive air samplers with *in vitro* bioassays to measure aryl hydrocarbon receptor activation induced by environmentally-relevant mixtures of vapor-phase HOCs

Project 4: Comparing passive and active air and water sampling approaches for measuring gaseous and dissolved emerging HOCs

Project 5: Investigating the fate and transport of dissolved organophosphate flame retardants in remote marine environments

#### META Environmental, Inc., Watertown, MA

Head Analytical Chemist & Laboratory Manager

February, 2010 - July, 2012

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**  
Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

**PUBLICATIONS**

---

**McDonough, C. A.;** De Silva, A. O.; Sun, C.; Adelman, D.; Soltwedel, T.; Bauerfiend, E.; Muir, D. C. G.; Lohmann, R. Dissolved organophosphate esters in North Atlantic depth profiles and Canadian Arctic surface waters. *Environ. Sci. Technol.* **2018**. DOI: 10.1021/acs.est.8b01127

**McDonough, C. A.;** Puggioni, G.; Helm, P. A.; Muir, D. C. G.; Lohmann, R. Spatial trends and diffusive air-water exchange of organic flame retardants in the lower Great Lakes. *Environ. Sci. Technol.* **2016**. *50*, 9133-9141. DOI: 10.1021/acs.est.6b02496

**McDonough, C. A.;** Helm, P. A.; Muir, D. C. G.; Puggioni, G.; Lohmann, R. Polycyclic musks in the air and water of the lower Great Lakes: Spatial distribution and volatilization from surface waters. *Environ. Sci. Technol.* **2016**. *50*, 11575-11583. DOI: 10.1021/acs.est.6b03657

**McDonough, C. A.;** Khairy, M.; Muir, D. C. G.; Lohmann, R. Significance of population centers as sources of gaseous and dissolved PAHs in the lower Great Lakes. *Environ. Sci. Technol.* **2014**. *48*, 7789-7797. DOI: 10.1021/es501074r

Liu, Y.; Wang, S.; **McDonough, C. A.;** Khairy, M.; Muir, D. C. G.; Helm, P.; Lohmann, R. Estimation of uncertainty in air-water exchange flux and gross volatilization loss of PCBs: A case study based on passive sampling in the lower Great Lakes. *Environ. Sci. Technol.* **2016**. September 13. DOI: 10.1021/acs.est.6b02891

Liu, Y.; Wang, S.; **McDonough, C. A.;** Khairy, M. ; Muir, D. C. G. ; Helm, P. ; Lohmann, R. Gaseous and freely dissolved PCBs in the lower Great Lakes based on passive sampling: Spatial trends, sources, and air-water exchange. *Environ. Sci. Technol.* **2015**. DOI: 10.1021/acs.est.5b04586

**First-Author Manuscripts in Preparation**

**McDonough, C. A.;** Guelfo, J. L.; Higgins, C. P. Measuring total PFASs in water: The tradeoff between selectivity and inclusivity. *Current Opinion in Environmental Science and Health, Invited review, submitted.*

**McDonough, C. A.;** Franks, D.; Zhang, X.; Jobst, K.; Helm, P.; Hahn, M. E.; Lohmann, R. Aryl hydrocarbon-mediated activity of gas-phase ambient air derived from passive sampling and an *in vitro* bioassay. *In prep.*

**McDonough, C. A.;** Higgins, C. P.; DeWitt, J. Dose-dependent immunotoxicity of AFFF-derived PFASs in an *in vivo* mouse model. *In prep.*

**McDonough, C. A.;** Choyke, S.; Doenges, K.; Quinn, K.; Strynar, M.; Ferguson, L.; DeWitt, J.; Higgins, C. Bioaccumulation and biological effects of novel AFFF-derived PFASs in an *in vivo* mouse model using HPLC-QTOF-MS. *In prep.*

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**  
Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu      P: 216.832.8932 (cell)

AWARDS AND FELLOWSHIPS

---

ACS C. Ellen Gonter Environmental Chemistry Paper Award (\$1,000)	2017
University of Rhode Island Research and Scholarship Excellence Award (\$500)	2017
GSO Alumni Student Travel Award (\$1,000)	2016
Lance A. Ricci Fellowship Fund Award (\$2,900)	2016
Hudson River Foundation Mark B. Bain Graduate Fellowship (\$15,000)	2016
University of Rhode Island Graduate School Fellowship (\$31,187)	2016
ACS Graduate Student Award in Environmental Chemistry (\$100)	2016
SETAC Student Travel Award (\$500)	2016
The Germaine and Francis Webb Fellowship in Oceanography (\$5,400)	2014
URI Enhancement of Graduate Research Award (\$1,000)	2014

ADVISING AND TEACHING EXPERIENCE

---

**University of Rhode Island**

- **Oceanographic Sciences (OCG 451):** Teaching Assistant and Guest lecturer, D. Smith and L. Rothstein instructors, undergraduate January - May, 2014
- **Marine Pollution (OCG 480/580):** Guest lecturer, R. Lohmann instructor, undergraduate and graduate March, 2016; 2017
- **Research Mentor for URI Undergraduate** Michael Vansco January, 2012 - August, 2015
- **Research Mentor for URI Summer Undergraduate Research Fellowship Program (SURFO)**  
Dmitro Martinowych June - August, 2013  
Michael Vansco and Carolyn Poutasse June - August, 2014  
Brittany Kerr June - August, 2015

**Colorado School of Mines**

- **Environmental Fate and Transport (CEEN 580):** Guest lecturer, C. Higgins instructor, graduate Fall 2017
- **Environmental Organic Chemistry (CEEN 551):** Guest lecturer, C. Higgins instructor, graduate Spring 2018

COMMITTEES & SERVICE

---

**ComSciCon National Communicating Science Workshop**

*Member, Leadership Board* June, 2016 - July, 2018  
*Chair, Program Organizing Committee* August, 2015 - June, 2016  
*Member, Program Organizing Committee* November, 2013 - August, 2015

**Society for Environmental Toxicology and Chemistry (SETAC)**

*Member, Student Outreach Sub-Committee* January, 2016 – June, 2017

**URI American Association of University Professors Conference on Climate Change**

*Panelist: "Communicating Climate Science"* April, 2016

**Delaware Sea Grant/Delaware National Estuarine Research Reserve Fellowship Competition**

*Reviewer of Fellowship Applications* October, 2016

**2015 SciX Meeting, Providence, RI**

*Chair & Organizer: "GC-MS Based Detection of Emerging Flame Retardants"* September, 2015

**2015 Meeting of the American Chemical Society, Boston, MA**

*Chair & Organizer: "Using Passive Sampling to Detect Organic Contaminants"* August, 2015

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**  
Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

**Society for Women in Marine Science (SWMS)**

*Conference Organizing Committee*

July - October, 2015

**Metcalf Institute for Marine and Environmental Reporting 2014 Workshop**

*Panelist: "Blogging Your Scientific Research"*

June, 2014

**Reviewer:** *Environmental Science & Technology; Chemosphere; Water*

2015 - present

**VOLUNTEER & OUTREACH ACTIVITIES**

---

**Oceanbites and Envirobites: Graduate Student Science Communication Blogs**

*Founder & Editor-in-Chief*

September, 2013 - present

**Marine Technology for Teachers and Students (MaTTS) Project Summer Institute**

*Lecturer and Workshop Leader*

July, 2016

**Oceanbites SURFO Blogging Workshop for Undergraduates, URI**

*Workshop Organizer and Leader*

July - August, 2015

**Metcalf Institute Science Immersion Workshop for Journalists, URI**

*Workshop Organizer and Leader*

April - June, 2015

**Science & Math Investigative Learning Experiences (SMILEs) for Middle School Students, URI**

*Workshop Organizer and Leader*

November - March, 2013

**GRRL Tech Interactive Technology Expo for Female High School Students, URI**

*Workshop Organizer and Leader*

December - March, 2013 - 2015

**Rhode Island Science & Engineering Fair (RISEF) for Middle School and High School Students**

*Judge of Student Projects*

March, 2013 - 2015

**PROFESSIONAL ORGANIZATIONS**

---

American Chemical Society (ACS)

Association of Environmental Engineers and Science Professors (AEESP)

Association for the Sciences of Limnology and Oceanography (ASLO)

International Association for Great Lakes Research (IAGLR)

Society of Environmental Toxicology and Chemistry (SETAC)

The Oceanography Society (TOS)

**SELECTED PRESENTATIONS & POSTERS**

---

McDonough, C.; Choyke, S.; Ferguson, L.; DeWitt, J.; Higgins, C. Bioaccumulation of poly- and perfluoroalkyl substances (PFASs) in mice dosed with aqueous firefighting foams (AFFF). **Poster.** *Gordon Research Conference on Environmental Science: Water*, Holderness (NH), June 2018.

McDonough, C.; De Silva, A. O.; Sun, C.; Adelman, D.; Muir, D. C. G.; Bauerfeind, E.; Soltwedel, T.; Lohmann, R. Dissolved organophosphate esters in Fram Strait and Canadian Arctic water. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Minneapolis (MN), November 2017.

McDonough, C.; Khairy, M.; Weinstein, M. P.; Lohmann, R. Synthetic fragrances and organic flame retardants in fish and water from the Passaic River, New Jersey. **Poster.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Minneapolis (MN), November 2017.

*[continued on next page]*

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**

Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

McDonough, C.; Schiffman, L. Bite-size science: Blogging with oceanbites and envirobites brings scientific research to broad audiences. **Poster.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Minneapolis (MN), November 2017.

McDonough, C.; Sun, C.; Soltwedel, T.; Bauerfeind, E.; Muir, D. C. G.; Lohmann, R. Dissolved organophosphate esters in the North Atlantic and Arctic Oceans. **Invited Talk, Gonter Award Symposium.** *Meeting of the American Chemical Society*, Washington (D.C.), August 2017.

McDonough, C.; Lohmann, R. Using polyethylene passive samplers to measure dissolved synthetic fragrances and organophosphate esters. **Platform.** *International Passive Sampling Workshop (IPSW)*, Toronto, Ontario, Canada, June 2017.

McDonough, C.; Sun, C.; Adelman, D.; Muir, D. C. G.; Bauerfeind, E.; Soltwedel, T.; Lohmann, R. Dissolved organophosphate esters in remote marine environments: Fram Strait depth profiles and Canadian Arctic surface waters. **Platform.** *Society for Environmental Toxicology and Chemistry European Meeting*, Brussels, Belgium, May 2017.

McDonough, C.; Helm, P. A.; Muir, D. C. G.; Lohmann, R. Measuring dissolved-phase halogenated flame retardants in the water of the Great Lakes using polyethylene passive samplers. **Poster.** *Society for Environmental Toxicology and Chemistry European Meeting*, Brussels, Belgium, May 2017.

McDonough, C.; Puggioni, G.; Helm, P.; Muir, D. C. G.; Lohmann, R. Dissolved organophosphate esters in the lower Great Lakes. **Platform.** *Meeting of the American Chemical Society*, San Francisco (CA), April 2017.

McDonough, C.; Puggioni, G.; Helm, P.; Muir, D. C. G.; Lohmann, R. Investigating spatial distribution and air-water exchange of dissolved emerging organic contaminants using polyethylene passive samplers. **Invited Talk.** *2nd Annual Workshop on Global Aquatic Passive Sampling (AQUA-GAPs)*, Guangzhou, China, November 2016.

McDonough, C.; Puggioni, G.; Helm, P.; Muir, D. C. G.; Lohmann, R. Air-water exchange of organic pollutants in the lower Great Lakes. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Orlando (FL), November 2016.

McDonough, C.; Hahn, M.; Lohmann, R. Passive polyethylene samplers and *in vitro* bioassays to investigate biological effects of complex mixtures of gaseous hydrophobic organic contaminants. **Poster.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Orlando (FL), November 2016.

McDonough, C. Oceanbites.org: Engaging online audiences with stories of oceanographic research. **Poster.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Orlando (FL), November 2016.

McDonough, C.; Puggioni, G.; Helm, P.; Muir, D. C. G.; Lohmann, R. Dissolved persistent bioaccumulative toxic compounds in the lower Great Lakes. **Poster.** *Gordon Research Conference on Environmental Sciences: Water*, Holderness (NH), June 2016.

*[continued on next page]*

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**

Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

McDonough, C.; Lohmann, R. The low-tech wave of the future: Measuring trace-level pollutants in air and water using plastic sheeting. **Invited Talk.** *Meeting of the Dean's Advisory Council.* Narragansett (RI), May 2016.

McDonough, C.; Lohmann, R. Polyethylene uptake of gaseous and dissolved hydrophobic organic contaminants (HOCs). **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting,* Salt Lake City (UT), November 2015.

McDonough, C.; Helm, P.; Muir, D. C. G.; Lohmann, R. Measuring gaseous organic flame retardants (OFRs) in Great Lakes air. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting,* Salt Lake City (UT), November 2015

McDonough, C.; Lohmann, R. Detection of truly dissolved and gaseous flame retardants in the lower Great Lakes region using polyethylene passive samplers. **Platform.** *SciX,* Providence (RI), September 2015.

McDonough, C.; Helm, P.; Muir, D. C. G.; Lohmann, R. Spatial distribution and diffusive air-water exchange of polybrominated diphenyl ethers (PBDEs) and synthetic musks in the lower Great Lakes. **Platform.** *Meeting of the American Chemical Society,* Boston (MA), August 2015.

McDonough, C.; Helm, P.; Muir, D. C. G.; Lohmann, R. Polyethylene uptake of gaseous brominated flame retardants (BFRs). **Platform.** *Meeting of the American Chemical Society,* Boston (MA), August 2015.

McDonough, C.; Dixon-Anderson, E.; Chebot, B.; Sun, C.; Lohmann, R. The Lohmann Lab: Assessing the risks of emerging contaminants. **Invited Talk.** *Metcalf Institute Science Immersion Workshop for Journalists.* Narragansett (RI), June 2015.

McDonough, C.; Lohmann, R. Spatial gradients and air-water exchange of dissolved legacy and emerging hydrophobic organic contaminants (HOCs) in the lower Great Lakes. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting,* Vancouver (ON), Canada, November 2014.

McDonough, C.; Lohmann, R. Spatial trends and air-water exchange of dissolved and gaseous flame retardants in the lower Great Lakes. **Platform.** *Meeting of the American Chemical Society,* San Francisco (CA), August 2014.

McDonough, C.; Khairy, M.; Lohmann, R. Dissolved and gaseous flame retardants in the lower Great Lakes. **Poster.** *Gordon Research Conference on Oceans and Human Health,* Biddeford (ME), June 2014.

McDonough, C. Bringing the excitement of oceanography to broad audiences: Oceanbites.org. **Poster.** *University of Rhode Island Graduate Conference,* Kingston (RI), April 2014.

McDonough, C.; Khairy, M.; Lohmann, R. Spatial trends of dissolved persistent bioaccumulative toxics (PBTs) and their relation to urban source regions: A passive sampling study on the lower Great Lakes. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting,* Nashville (TN), November 2013.

*[continued on next page]*

**Carrie A. McDonough, Ph.D., Postdoctoral Fellow**

Civil & Environmental Engineering Department, Colorado School of Mines,  
1500 Illinois Street, Golden, CO 80401  
E: cmcdonough@mines.edu P: 216.832.8932 (cell)

McDonough, C.; Lohmann, R. Detection of emerging persistent bioaccumulative toxics (PBTs) in the Great Lakes using polyethylene passive samplers. **Poster.** *International Association for Great Lakes Research Annual Meeting*, West Lafayette (IN), June 2013.

McDonough, C.; Adelman, D.; Lohmann, R. Contaminant monitoring as an outreach opportunity: passive sampling by volunteer networks. **Poster.** *ComSciCon: Communicating Science National Workshop*, Cambridge (MA), June 2013.

REFERENCES

---

Dr. Rainer Lohmann  
Professor of Oceanography  
Graduate School of Oceanography  
University of Rhode Island  
215 South Ferry Road  
Narragansett, RI 02882  
Phone: 401.874.6612  
Email: rlohmann@uri.edu

Dr. David C. Smith  
Professor & Associate Dean  
Graduate School of Oceanography  
University of Rhode Island  
215 South Ferry Road  
Narragansett, RI 02882  
Phone: 401.874.6172  
Email: dcsmith@uri.edu

Dr. Christopher P. Higgins  
Associate Professor  
Civil & Environmental Engineering Dept.  
Colorado School of Mines  
1500 Illinois Street  
Golden, CO 80401  
Phone: 303.384.2002  
Email: chiggins@mines.edu

Dr. Mark E. Hahn  
Senior Scientist  
Department of Biology  
Woods Hole Oceanographic Institution  
266 Woods Hole Road  
Woods Hole, MA 02543  
Phone: 508.289.3242  
Email: mhahn@whoi.edu

Dr. Angela Slitt  
Associate Professor, Director of Graduate Programs  
College of Pharmacy  
University of Rhode Island  
7 Greenhouse Road  
Kingston, RI 02881  
Phone: 401.874.5020  
Email: aslitt@uri.edu