

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

Civil & Environmental Engineering Department

Colorado School of Mines,

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EDUCATION

- 2017 Ph.D. Oceanography University of Rhode Island Graduate School of Oceanography**
Dissertation: *Spatial distributions, air-water exchange, and toxicity of organic pollutants using passive samplers*; Advisor: Rainer Lohmann; GPA: 4.0/4.0
- 2008 B.Sc. Chemistry Massachusetts Institute of Technology**
Advisor: John Essigmann; GPA: 4.2/5.0

PROFESSIONAL EXPERIENCE

- 2017-present Postdoctoral Fellow, Colorado School of Mines Golden, CO**
- Project 1: Characterizing profiles of per- and polyfluoroalkyl substances (PFASs) and identifying modulated endogenous metabolites in serum, urine, and tissues from mice exposed to aqueous firefighting foam (AFFF) – *Collab. with Prof. Jamie C. DeWitt at East Carolina University, the Reisdorph group at the University of Colorado Anschutz Metabolomics Core Facility, and Dr. Michael Quinn at the U.S. Army Institute of Public Health; Supported by internal Colorado School of Mines development funds and U.S. Army.*
- Project 2: Characterizing profiles of PFASs in serum from residents of Colorado Springs communities with AFFF-contaminated drinking water – *Collab. with Prof. John Adgate and Prof. Anne Starling at the Colorado School of Public Health; Funded by an NIEHS R21*
- Project 3: Investigating the fate, transport, and bioaccumulation of PFASs from sites with distinct contamination sources in Svalbard and Oslo, Norway – *Collab. with Dr. Sarah Hale and Dr. Gijs Breedveld at the Norwegian Geotechnical Institute (NGI); Funded by the Norwegian government*
- Project 4: Developing a high-resolution mass spectrometry library for nontarget screening of environmental samples for novel PFASs – *Funded by the US Strategic Environmental Research & Development Program (SERDP)*
- 2012-2017 Graduate Research Assistant, University of Rhode Island Narragansett, RI**
- Project 1: Investigating spatial distributions and air-water exchange of hydrophobic organic contaminants (HOCs) in the Great Lakes region using polyethylene passive samplers – *Collab. with Dr. Derek Muir at Environment & Climate Change Canada and Dr. Paul Helm at Ontario Ministry of the Environment & Climate Change; funded by the U.S. EPA Great Lakes Restoration Initiative*
- Project 2: Measuring bioaccumulation and biomagnification of synthetic fragrances and halogenated flame retardants in a Passaic River food web – *Funded by a Hudson River Foundation Mark B. Bain Graduate Fellowship*
- Project 3: Coupling passive air samplers with *in vitro* bioassays to measure aryl hydrocarbon receptor activation induced by mixtures of vapor-phase HOCs – *Collab. with Dr. Mark Hahn at the Woods Hole Oceanographic Institution; supported by a URI Enhancement of Graduate Research Award*
- Project 4: Investigating fate and transport of dissolved organophosphate flame retardants in remote marine environments – *Collab. with Dr. Eduard Bauerfeind and Dr. Thomas Soltwedel at the Alfred Wegner Institute and with Dr. Derek Muir and Dr. Amila De Silva at Environment & Climate Change Canada; funded by NSF Arctic and Indigenous & Northern Affairs Canada*

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2010-2012 Analytical Chemist, META Environmental Watertown, MA
Maintained and operated GC-MS instrumentation, performed analysis of polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) for source fingerprinting.

AWARDS & FELLOWSHIPS

CH2M and AEESP Outstanding Doctoral Dissertation Award	2018
ACS C. Ellen Gonter Environmental Chemistry Paper Award	2017
University of Rhode Island Research and Scholarship Excellence Award	2017
GSO Alumni Student Travel Award	2016
Lance A. Ricci Fellowship Fund Award	2016
Hudson River Foundation Mark B. Bain Graduate Fellowship	2016
University of Rhode Island Graduate School Fellowship	2016
ACS Graduate Student Award in Environmental Chemistry	2016
SETAC Student Travel Award	2016
The Germaine and Francis Webb Fellowship in Oceanography	2014
URI Enhancement of Graduate Research Award	2014

PUBLICATIONS

11 Peer-Reviewed Manuscripts Published or In Press
6 Articles as First Author
5 Articles as Contributing Author
3 First Author Manuscripts in Preparation
h-index (as of November 2018): 5 (*via Google*)

1. **McDonough, C. A.;** Franks, D.; Hahn, M. E.; Lohmann, R. Aryl hydrocarbon-mediated activity of gas-phase ambient air derived from passive sampling and an *in vitro* bioassay. *Environ. Toxicol. Chem.* **2019**. *Accepted*.
2. **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 & Health.* **2018**. *In press*. DOI: 10.1016/j.coesh.2018.08.005.
3. **McDonough, C. A.;** De Silva, A. O.; Sun, C.; Adelman, D.; Soltwedel, T.; Bauerfeind, E.; Muir, D. C. G.; Lohmann, R. Dissolved organophosphate esters in North Atlantic depth profiles and Canadian Arctic surface waters. *Environ. Sci. Technol.* **2018**. *52*, 6208-6216. DOI: 10.1021/acs.est.8b01127
4. Ma, Y.; Adelman, D.; Bauerfeind, E.; Cabrerizo, A.; **McDonough, C. A.;** Muir, D. C. G.; Soltwedel, T.; Sun, C.; Wagner, C.; Sunderland, E.; Lohmann, R. Concentrations and water mass transport of legacy POPs in the Arctic Ocean. *Geophys. Res. Lett.* **2018**. *45* (23), 12972-12981. DOI: 10.1029/2018GL078759

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

5. Murray, C. C.; Vatankhah, H.; **McDonough, C. A.**; Nickerson, A.; Hedtke, T. T.; Higgins, C. P.; Bellona, C. L. Removal of per- and polyfluoroalkyl substances using super-fine powder activated carbon and ceramic membrane filtration compared to granular activated carbon. *J. Hazard Mater.* **2018**, *366*, 160-168. DOI: 10.1016/j.jhazmat.2018.11.050
6. Bradley, P.; Kolpin, D.; Romanok, K.; Smalling, K.; Focazio, M.; Brown, J.; Cardon, M.; Carpenter, K.; Corsi, S.; De Cicco, L.; Dietze, J.; Evans, N.; Furlong, E.; Givens, C.; Gray, J.; Griffin, D.; Higgins, C.; Hladik, M.; Iwanowicz, L.; Journey, C.; Kuivila, K.; Masoner, J.; **McDonough, C. A.**; Meyer, M.; Orlando, J.; Strynar, M.; Weis, C.; Wilson, V. Reconnaissance of mixed organic and inorganic chemicals in private and public supply tap waters at selected residential and workplace sites in the U.S. *Environ. Sci. Technol.* **2018**, *52* (23), 13972-13985. DOI: 10.1021/acs.est.8b04622
7. **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
8. **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
9. 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**, *50*, 10894-10902. DOI: 10.1021/acs.est.6b02891
10. 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**, *10*, 4932-4939. DOI: 10.1021/acs.est.5b04586
11. **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

Manuscripts in Preparation

1. **McDonough, C. A.**; Ward, C.; Hu, Q.; Vance, S.; Higgins, C. P.; DeWitt, J. Suppression of the antigen-specific antibody response by an aqueous firefighting foam. *In prep.*
2. **McDonough, C. A.**; Choyke, S.; Doenges, K.; Quinn, K.; Strynar, M.; Ferguson, L.; DeWitt, J.; Higgins, C. Bioaccumulation of novel PFASs and modulation of endogenous metabolites in an *in vivo* mouse model exposed to an aqueous firefighting foam. *In prep.*
3. **McDonough, C. A.**; Barton, K.; Starling, A.; Adgate, J.; Higgins, C. P. Novel and legacy PFASs in AFFF-impacted drinking water and human serum from Colorado Springs, CO. *In prep.*

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ADVISING & TEACHING EXPERIENCE

University of Rhode Island (URI)

- **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
- **Co-Advisor for URI Undergraduate** Michael Vansco January, 2012 - August, 2015
Project Title: Diffusion coefficients of brominated flame retardants in low-density polyethylene
- **Research Mentor for URI Summer Undergraduate Research Fellowship Program (SURFO)** Dmitro Martinowych June - August, 2013
Project Title: An evaluation of polycyclic aromatic hydrocarbon uptake into polyethylene samplers
Brittany Kerr June - August, 2015
Project Title: Determination of polyethylene-water partitioning coefficients for organophosphate flame retardants and current-use pesticides

Colorado School of Mines (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
- **Co-Advisor for Mines Ph.D. Students**
Juliane Brown September 2017 - present
Meaghan Guyader September 2017 - present
- **Research Advising for Mines Undergraduates**
Sarah Mass January 2018 - present
Daisy Fuchs June 2018 - present
Abigail Paul June - September 2018

SERVICE & OUTREACH ACTIVITIES

ComSciCon National Communicating Science Workshop

Member, Leadership Board June, 2016 - present

Chair, Program Organizing Committee August, 2015 - June, 2016

Member, Program Organizing Committee November, 2013 - August, 2015

ScienceBites: A Global Network of Student-Run Science Communication Blogs

Founder and Chair of Organizing Committee January 2018 - present

Oceanbites and Envirobites: Graduate Student Science Communication Blogs

Founder and Editor-in-Chief September, 2013 – present

2018 Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC)

Chair and Organizer: "Human Health and Ecosystem Risk Assessment for PFASs" November, 2018

Society for Environmental Toxicology & Chemistry (SETAC)

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

Oceanbites SURFO Blogging Workshop for Undergraduates, URI

Workshop Organizer and Leader July - August, 2015 - 2016

Delaware Sea Grant/Delaware National Estuarine Research Reserve Fellowship Competition

Reviewer of Fellowship Applications October, 2016

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Marine Technology for Teachers & Students (MaTTS) Project Summer Institute

Lecturer and Workshop Leader

July, 2016

URI American Association of University Professors Conference on Climate Change

Panelist: "Communicating Climate Science"

April, 2016

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

Workshop Organizer and Leader

January - March, 2013 - 2015

2015 SciX Meeting, Providence, RI

Chair and Organizer: "GC-MS Detection of Emerging Flame Retardants"

September, 2015

2015 Meeting of the American Chemical Society, Boston, MA

Chair and Organizer: "Using Passive Sampling to Detect Organic Contaminants"

August, 2015

Society for Women in Marine Science (SWMS)

Conference Organizing Committee

July - October, 2015

Metcalf Institute Science Immersion Workshop for Journalists, URI

Workshop Organizer and Leader

April - June, 2015

Metcalf Institute for Marine & Environmental Reporting 2014 Workshop

Panelist: "Blogging Your Scientific Research"

June, 2014

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

Workshop Organizer and Leader

November - March, 2013

Reviewer: *Environmental Science & Technology; Environmental Toxicology & Chemistry;*

Environment International; Chemosphere; Water; International Journal of Environmental Research and Public Health

PRESENTATIONS & POSTERS

30 Platform and Poster Presentations as Presenting Author

19 Talks as Presenting Author

4 Invited Conference and Workshop Talks

4 International Conference and Workshop Talks

11 Posters as Presenting Author

1. McDonough, C.; Choyke, S.; Strynar, M.; Ferguson, L.; DeWitt, J.; Higgins, C. Bioaccumulation of poly- and perfluoroalkyl substances (PFASs) from exposure to aqueous firefighting foam (AFFF) in a mouse model. **Platform.** *Society for Environmental Toxicology and Chemistry North America Meeting*, Sacramento (CA), November 2018.
2. McDonough, C.; Schiffman, L.; Sanders, N. ScienceBites: A multidisciplinary online community for early-career scientist writers. **Platform.** *Society for Environmental Toxicology and Chemistry North American Meeting*, Sacramento (CA), November 2018.
3. 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.
4. 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.

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5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.

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

16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. McDonough, C. Bringing the excitement of oceanography to broad audiences: Oceanbites.org. **Poster**. *University of Rhode Island Graduate Conference*, Kingston (RI), April 2014.

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

28. 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.
29. 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.
30. 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.