**Michael J. O’Shea**

**EDUCATION**

**University of Pennsylvania, Department of Earth and Environmental Science**, Expected May 2021

**PhD Candidate:** Earth and Environmental Science **Dissertation:** Urban geochemistry in a post-industrial environment

**Advisor:** Dr. Reto Gieré

**Committee:** Dr. Douglas Jerolmack, Dr. David Goldsby, Dr. Mark Krekeler, Dr. Alain Plante

**State University of New York, Geneseo, Department of Geological Sciences*,*** May 2016  **B.A.** in Geological Sciences **Advisor:** Dr. Amy Sheldon

**RESEARCH EXPERIENCE**

**PhD Candidate, University of Pennsylvania**, Fall 2016 – present

* Independently managed and conducted a mineralogic and chemical characterization of urban road dust in Philadelphia, PA (ICP-OES, laser diffraction, XRD, LOI, ArcGIS, XRF) – Chapter 1 of thesis.
* Executed statistical analyses of road dust characterization data (Stata) and interpreted results.
* Published a manuscript in *Environmental Science and Pollution Research* detailing my work and defining my novel use of instrumentation and sampling techniques.
* Sampled, analyzed, and interpreted data from soils and road dust at collocated sample sites. These sites were targeted due to high Pb pollution and were compared at a two size fractions (SEM, TEM, ICP-OES, laser diffraction, XRD, LOI, Arc GIS) – Chapter 2 of thesis.
* Microscopically (SEM and TEM) investigated the form and size of Pb particles in the collected samples with Dr. Mark Krekeler at the Center for Advanced Imaging and Microscopy (Miami University, Ohio).
* Preparing a manuscript describing this novel work to be submitted to the *Journal of Hazardous Materials*.
* Developed and executed an experimental procedure testing the interaction of yellow traffic paint, containing PbCrO4, with simulated environmental (rainwater) and biofluids (gut and lung) – Chapter 3 of thesis.
* Characterized and interpreted results before and after interaction with fluids (XRD, light microscopy, XRF, ICP-OES, TEM, and SEM).
* Published my manuscript regarding this work in *Science of the Total Environment*.
* Mentored fellow graduate students and undergraduate students with laboratory procedures, grant writing, editing, and manuscript creation.

**Visiting PhD Candidate, German Meteorological Service**, Freiburg, Germany, Summer 2017

* Worked towards developing a novel method of characterizing urban road dust via optical microscopy.
* Performed and assessed road dust sampling techniques in Freiburg, Germany.

**Research Aide, SUNY Geneseo**, Summer 2015 – May 2016

* Studied impact craters on the Martian surface with ArcGIS via NASA funding.
* Gathered information for landing site selection for Mars 2020.

**Research Assistant, SUNY Geneseo**, Fall 2013 – Spring 2015

* Performed geochemistry research with Dr. Amy Sheldon to determine the sorptive properties of chloroflurocarbons (CFCs) in the water table in order to evaluate them as a groundwater tracer.

**SELECTED HONORS AND AWARDS**

* Graduate Ben Talk finalist and winner – Natural Science category, Spring 2020
* Benjamin Franklin Fellowship, Fall 2016 – present
* Teece Fellowship, Fall 2018 – Spring 2019
* Greg and Susan Walker Endowment Grant, Summer 2017, Fall 2018, Fall 2019, Summer 2020
* Dust Conference Student Travel Grant, Summer 2018
* Departmental Service Award, Spring 2016
* Nomination, Best Undergraduate Poster, LPSC, Spring 2016

**PUBLICATIONS**

* **O’Shea, M.J**., Vann, D.R., Hwang, W.T., & Gieré, R. (2020). A chemical and mineralogic assessment of road dust in Philadelphia, PA, *Environmental Science and Pollution Research*, 27(13), 14883-14903. doi: 10.1007/s11356-019-06746-y
* Vigliaturo, R., Della Ventura, G., Choi, J.K., Marengo, A., Lucci, F., **O’Shea, M.J**., Perez-Rodriguez, I., & Gieré, R. (2018). Mineralogical characterization and dissolution experiments in Gamble’s solution of tremolitic amphibole from Passo di Caldenno (Sondrio, Italy), *Minerals*, 8, 557
* **O’Shea, M.J**., Vigliaturo, R., Choi, J.K., McKeon, T., Krekeler, M.P.S., & Gieré, R. (2021). Alteration of yellow traffic paint in simulated environmental and biological fluids, *Science of the Total Environment* 750, 14102
* **O’Shea, M.J**., Vann, D.R., Krekeler, M.P.S., & Gieré, R. (in prep). Analysis of collocated urban road dust and soils samples in a Pb polluted area - to be submitted to *Journal of Hazardous Materials*
* Vigliaturo, R., Elkassas, S.M., **O’Shea M.J**., et al… (in submission). Morphometrical and crystallochemical multi-scale characterizations of glaucophane from Chiavolino (Biella, Italy) – submitted to *European Journal of Mineralogy*
* **O’Shea, M.J**., Toupal, J., Wood, A., Pepino, R., Howarth, M., & Gieré, R. (in prep). Surface soil Pb concentrations in Philadelphia: a historic prediction of high-risk areas – to be submitted to *Science of the Total Environment*
* **O’Shea, M.J.,** Dietrich, M., Gieré, R., Krekeler, M.P.S. (in prep). A review of North American street sediment studies – to be submitted to *Journal of Hazardous Materials*

**PRESENTATIONS**

* **O’Shea, M.J**., Vigliaturo, R., Choi, J.K., McKeon, T.P., Krekeler, M.P.S., & Gieré, R. Microscopic investigation of yellow traffic paint particles subjected to aqueous dissolution, Goldschmidt International Meeting, Honolulu, Hawai’i, June 2020 (online)
* **O’Shea, M.J**., Vigliaturo, R., Choi, J.K., Krekeler, M.P.S., & Gieré, R. Dissolution Experiment of Yellow Traffic Paint Containing Lead Chromate (PbCrO4), Geological Society of America National Meeting, Phoenix, AZ, September 2019 (oral)
* **O’Shea, M.J**., Vann, D.R., Plante, A.F., & Gieré, R. A compositional comparison of urban road dust and soil in Philadelphia, PA, Geological Society of America National Meeting, Indianapolis, IN, November 2018 (oral)
* **O’Shea, M.J**., Vann, D.R., Haber, S.J., & Gieré, R. Mineralogical and Chemical Analysis of Road Sediment in Philadelphia, PA, DUST 2018, Bari, Italy, May 2018 (oral)
* **O’Shea, M.J**., Haber, S.J., Elmi, C., Vann, D.R., & Gieré, R. Mineralogical and Chemical Characterization of Road Dust in Philadelphia, PA, Geological Society of America National Meeting, Seattle, WA, November 2017 (oral)
* **O’Shea, M.J**., Haber, S.J., Elmi, C., & Gieré, R., Urban Road Dust: A geochemical and public health assessment in Philadelphia, PA, Center for Excellent in Environmental Toxicology Symposium, Philadelphia, PA, June 2017 (poster)
* **O’Shea, M.J**., Warner, N.H., Gupta, S., Eckes, S.W., Werynski, A., & Smith, J. Using the morphology of impact craters as a relative age indicator for fluvial activity at Xanthe Terra, Mars, Lunar and Planetary Science Conference, Houston, TX, March 2016 (poster)
* **O’Shea, M.J**., Warner, N.H., Gupta, S., Eckes, S.W., Werynski, A., & Smith, J. Using the morphology of impact craters as a relative age indicator for fluvial activity at Xanthe Terra, Mars, Geological Society of America National Meeting, Baltimore, MA, November 2015 (poster)

**LOCAL PRESENTATIONS**

* **O’Shea, M.J**. Urban Road Dust: Investigating Philly’s street gunk as both source and sink for pollutants, Graduate Ben Talk (**finalist and winner**), Philadelphia, PA, February 2020 (oral)
* **O’Shea, M.J**., Vigliaturo, R., Choi, J.K., Krekeler, M.P.S., & Gieré. R. Electron microscopy in medical mineralogy: yellow traffic paint as a case study, Singh Center for Nanotechnology Annual Users Meeting, Philadelphia, PA, November 2019 (poster)
* **O’Shea, M.J**., Haber, S.J., Elmi, C., & Gieré, R. Urban Road Dust: A geochemical analysis of a potential public health issue, Air Pollution Control Board Meeting, Philadelphia, PA, May 2017 (oral)
* **O’Shea, M.J**., Haber, S.J., Elmi, C., & Gieré, R. Urban Road Dust: A geochemical and public health assessment in Philadelphia, PA, Exxon Mobil Conference, Philadelphia, PA, March 2017 (poster)
* **O’Shea, M.J**., Haber, S.J., & Gieré, R. Urban Road Dust Assessment, Air Quality Work Group, Philadelphia, PA, December 2016 (oral)

**SKILLS**

* ArcGIS
* ENVI
* SEM (EDXS)
* XRD
* ICP-OES
* XRF (benchtop and gun)
* Light microscopy
* Laser diffraction
* Loss on ignition
* Dissolution experiments
* Data analysis & statistics with STATA

**TEACHING EXPERIENCE**

**Graduate Teaching Assistant, University of Pennsylvania**, Fall 2016 **–** present

* GEOL 100 Introduction to Geology (Fall 2019)
  + As head TA, taught multiple recitations, and was fully responsible for the recitation portion of the class where I demonstrated the basics tenets of geology.
* GEOL 130 Introduction to Oceanography (Spring 2019)
  + Led reverse classroom multimedia assignments and taught as a part of an interactive classroom.
* Introduction to Geochemistry and Environmental Science (Summer 2018)
  + Personally developed class for Penn Summer Prep, a program for high achieving high school students. Wrote multiple letters of recommendation for young aspiring scientists.
* Center for Teaching and Learning (CTL) Teaching Certificate (Spring 2018)
  + Completed the CTL teaching certificate which involved partaking in many teaching seminars, in class recording and observation of teaching, and the development of a teaching philosophy.
* ENVS 100 Introduction to Environmental Science (Spring 2017, 2018)
  + Led in class assignments utilizing an interactive classroom.
  + Head TA in 2018 leading the online class discussion board in addition to classroom responsibilities where I used my knowledge of sampling techniques and materials characterizations to guide students.

**LEADERSHIP AND OUTREACH**

**Overbrook Environmental Center** (Summer 2018)

* Tested Pb and heavy metal levels of local citizen’s soils and provided education on Pb exposure at this soil kitchen.

**City of Philadelphia** (Fall 2016 – present)

* Collaborated with both the Air Pollution Control Board and Air Quality Work Group on urban road dust.

**Penn Geology Society** (Fall 2016 – 2018)

* Co-founded and served as graduate student chair of this undergraduate focused club.
* Led field trips and provided geologic support to the club.

**Falling Walls Conference** (Fall 2018, Fall 2019)

* Assisted with the organization of the conference at the University of Pennsylvania which was an opportunity for diverse researchers to present TED style presentations.

**SUNY Geneseo** (Fall 2012 – Spring 2016)

* Performed over 50 hours of annual community service including work with Habitat for Humanity and Foodlink.
* Served as president of the Geneseo Geology society. Led departmental activities and gatherings including the annual departmental award ceremony, holiday party, and organized fundraising efforts.
* Worked as vice president and was a founding member of the Geneseo chapter of AIPG. Paired students with professional mentors in the field and facilitated professional connections for undergraduate geologists seeking employment.
* As president of the Geneseo Geology Honors society, sigma gamma epsilon, organized the student chapter and facilitated student induction and ceremonial activities.

**PROFESSIONAL AFFILIATIONS**

* American Institute of Professional Geologists, Fall 2015 – present
* Geological Society of America, Fall 2015 – present
* Geology and Health, Fall 2018 – present
* Mineralogical Society of America, Fall 2019 – present

**REFERENCES**

* Dr. Dr. Reto Gieré, [giere@sas.upenn.edu](mailto:giere@sas.upenn.edu), 215-898-6907, 240 S. 33rd Street, Philadelphia, PA
* Dr. Douglas Jerolmack, [sediment@sas.upenn.edu](mailto:sediment@sas.upenn.edu), 215-746-2823, 240 S. 33rd Street, Philadelphia, PA
* Dr. David Goldsby, [dgoldsby@sas.upenn.edu](mailto:dgoldsby@sas.upenn.edu), 215-746-0090, 240 S. 33rd Street, Philadelphia, PA
* Dr. Mark Krekeler, [krekelmp@miamioh.edu](mailto:krekelmp@miamioh.edu), 513-785-3106, 250 S. Patterson Ave, Oxford, OH