EDWARD J. O'LOUGHLIN

Argonne National Laboratory
Biogeochemistry and Microbial Ecology Group
Biosciences Division
Building 203, Room E-137
Argonne, IL 60439-4843

Phone: (630) 252-9902
oloughlin@anl.gov
edward.oloughlin@northwestern.edu
http://www.mesg.anl.gov/
Google Scholar Page

Education

Ph. D. Ohio State University (Environmental Chemistry) 1997
Dissertation: Association of Organotin Compounds with Aquatic Humic Substances
Advisors: Drs. Yu-Ping Chin and Samuel J. Traina

M. S. Ohio State University (Environmental Biology) 1991
Thesis: Adsorption and Biodegradation of 2-Methylpyridine in Aqueous Suspensions of Specimen Clay Minerals
Advisors: Drs. Gerald K. Sims and Samuel J. Traina

B. S. Cleveland State University (Biology/Chemistry) 1986

Research Experience

Senior Fellow, Northwestern Argonne Institute of Science and Engineering (NAISE), 2014-present
Staff Scientist, Argonne National Laboratory 2001-present.
Postdoctoral Research Associate, Argonne National Laboratory 2000-2001.
Current research focuses on the biogeochemical processes affecting the fate and transport of organic and inorganic contaminants and greenhouse gas emission in aquatic and terrestrial environments. Specific areas of interest include:

- Linkages between microbial community dynamics and net methane and carbon dioxide fluxes in temperate and tropical soils and sediments
- Novel pathways for microbial methane oxidation
- Effects of electron donors, electron acceptors, and electron shuttles on dissimilatory iron and sulfate reduction and microbial community development
- Microbial and geochemical controls on dissimilatory iron reduction and Fe^{II}-bearing secondary mineral formation
- Reduction of U^{VI} by biogenic Fe^{II}-bearing minerals formed from dissimilatory iron reduction
- Stability/reactivity of U^{IV} species with respect to abiotic and microbial oxidation
- Abiotic reduction of Hg^{II} by reductants (Fe^{II}, Mn^{II}, etc.) in suboxic and anoxic environments
- Reduction of contaminants by microbially reduced humic substances
- Effects of transition metals on the reductive dehalogenation of chlorinated aliphatic hydrocarbons by mixed Fe^{II}/Fe^{III} hydroxides, (i.e., "green rusts")
- Interaction of trace elements with microbial exopolysaccharides, bacteria, and iron oxyhydroxides

National Research Council Postdoctoral Associate, Tyndall Air Force Base 1997-2000. Examined processes affecting the fate and transport of trichloroethylene (TCE) in subsurface environments. Specific projects include:

- Reductive dehalogenation of chlorinated aliphatic hydrocarbons by mixed Fe^{II}/Fe^{III} hydroxides (i.e. "green rusts")

- Investigation of the potential for humic-transition metal complexes to act as electron transport mediators in the reductive transformation of organic contaminants
- Design, construction and field testing of flux chambers to measure TCE volatilization from TCE contaminated aquifers

Graduate Research Assistant, Ohio State University 1987-1997. Participated in many interdisciplinary research projects in the areas of:

Environmental Microbiology

- Isolation and characterization of aromatic *N*-heterocycle degrading bacteria
- Riboflavin overproduction by *Micrococcus luteus* during pyridine degradation
- Biodegradation of aromatic *N*-heterocycles in subsurface sediments
- Effects of sorption on the biodegradation of aromatic *N*-heterocycles

Environmental Chemistry

- Sorption of aromatic *N*-heterocycles (e.g., pyridines) to clay minerals
- Sorption of atrazine and alachlor to subsurface sediments
- Isolation and characterization of humic substances in lacustrine sediment porewaters
- Association of organotin compounds with aquatic humic substances

Refereed Publications

O'Loughlin, E. J., C. Gorski, D. Latta, M. I. Boyanov, K. M. Kemner, R. E. Cook, M. McCormick, and M. M. Scherer. (In preparation). Effects of mineralogy and phosphate on secondary mineral formation following the bioreduction of Fe(III) oxides and oxyhydroxides. *Geochemical Transactions.*

O'Loughlin, E. J., C. Gorski, R. E. Cook, and M. M. Scherer. (In preparation). Effects of electron donors on the formation of secondary mineralization products resulting from the bioreduction of lepidocrocite by *Shewanella putrefaciens* CN32. *Geomicrobiology Journal.*

Boyanov M. I., E. J. O'Loughlin, M. J. Kwon, X. Rui, T. Shibata, B. M. Mishra, and K. M. Kemner. (In preparation) The role of phosphate in the redox reactivity between U(VI) and Fe(II) species. *Environmental Science and Technology.*

Antonopoulos, D. A., **O'Loughlin, E. J. (co first author),** K. A. Skinner, J. M. Brulc, E. Johnston, M. I. Boyanov, M. J. Kwon, P. E. Long, K. H. Williams, and K. M. Kemner. (In preparation). Microbial community development under sulfate- and iron-reducing conditions based on electron shuttle amendment. *PLoS One.*

Latta, D. E., M. I. Boyanov, K. M. Kemner, **E. J. O'Loughlin,** and M. M. Scherer. (In preparation). Sorption and reduction of uranium by green rusts. *Current Inorganic Chemistry.*

O'Loughlin, E. J., C. A. Gorski, and M. M. Scherer. (In preparation). Effects of phosphate on secondary mineral formation during bioreduction of akaganeite (β-FeOOH): Green rust versus magnetite. *Current Inorganic Chemistry.*

Kwon, M. J., **E. J. O'Loughlin**, M. I. Boyanov, J. M. Brulc, E. R. Johnston, K. M. Kemner, and D. A. Antonopoulos. (Rejected by ISME Journal, in revision for submission to alternate journal). Impact of organic carbon electron donors on microbial community development under iron- and sulfate-reducing conditions.

Dong, Y., R. A. Sanford, M. I. Boyanov, K. M. Kemner, T. M. Flynn, **E. J. O'Loughlin**, I. K. O. Cann, R. M. Mackie, R. A. Locke, J. R. Weber, S. M. Egan, and B. W. Fouke. (In preparation). Isolation

and characterization of two metal-reducing Firmicutes bacteria from 1.7-2.0 km Cambrian-age Mt. Simon Formation of the Illinois Basin, USA. *Applied and Environmental Microbiology.*

Johnson, C. R., M. I. Boyanov, J. Koval, D. A. Antonopoulos, K. M. Kemner, and **E. J. O'Loughlin**. (In preparation). Behavior of antimony(V) under sulfate-reducing conditions. *Environmental Science and Technology.*

Kwon, M. J., J.-S. Yang, Ba. Ham, M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. (In review). Geochemical characteristics and microbial community composition in toxic metal-rich sediments contaminated with Au-Ag mine tailings. *Journal of Hazardous Materials.*

Shim, M. J., G. Lee, Y. H. Hwang, W. R. Lee, J.-S. Yang, **E. J. O'Loughlin**, M. J. Kwon. (In review). Long-term and spatial variation of elemental concentrations in local streams impacted by abandoned mine drainage treated with limestone. *Science of the Total Environment.*

Handley, K., D. Bartels, **E. J. O'Loughlin,** K. H. Williams, W. L. Trimble, K. Skinner, J. A. Gilbert, N. Desai, E. M. Glass, T. Paczian, A. Wilke, D. Antonopoulos, K. Kemner, and F. Meyer. (In press). The complete genome sequence for putative H_2- and S-oxidizer *Candidatus* Sulfuricurvum sp. assembled *de novo* from an aquifer-derived metagenome. *Environmental Microbiology.* DOI:10.1111/1462-2920.12453

Kwon, M. J., J.-S. Yang, M. J. Shim, M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. (2014). Acid extraction overestimates total Fe(II) in the presence of iron (hydr)oxides and sulfide minerals. *Environmental Science and Technology Letters.* 1(7):310-314. DOI:10.1021/ez500152h.

Yang, J.-S., M. J. Kwon, J. Choi, K. Baek, and **E. J. O'Loughlin**. (2014). The transport behavior of As, Cu, Pb, and Zn during electrokinetic remediation of a contaminated soil using electrolyte conditioning. *Chemosphere.* 117:79-86. DOI:10.1016/j.chemosphere.2014.05.079

Flynn, T. M., **E. J. O'Loughlin**, T. J. DiChristina, and K. M. Kemner. (2014). Sulfur-mediated electron shuttling during bacterial iron reduction. *Science.* 344(6187):1039-1042. DOI:10.1126/science.1252066.

Kwon, M. J., M. I. Boyanov, D. A. Antonopoulos, J. M. Brulc, E. R. Johnston, K. Skinner, K. M. Kemner, and **E. J. O'Loughlin**. (2014). Effects of sulfate reduction on Fe^{III} (hydr)oxide reduction and microbial community development. *Geochimica et Cosmochimica Acta.* 129:177-190. DOI:10.1016/j.gca.2013.09.037

Kwon, M. J., J.-S. Yang, M. J. Shim, S. Lee, M. Boyanov, K. Kemner, and **E. O'Loughlin**. (2014). Biotic and abiotic reduction of goethite (a-FeOOH) by subsurface microorganisms in the presence of electron donor and sulfate. *Journal of Soil and Groundwater Environments.* 19(1):54-62. DOI: 10.7857/JSGE.2014.19.1.054

O'Loughlin, E. J., M. I. Boyanov, T. M. Flynn, C. A. Gorski, S. M. Hoffman, M. L. McCormick, M. M. Scherer, and K. M. Kemner. (2013). Effects of bound phosphate on the bioreduction of lepidocrocite (γ-FeOOH) and maghemite (γ-Fe_2O_3) and secondary mineral formation. *Environmental Science and Technology*. 47(16):9157-9166. DOI: 10.1021/es400627j

Pasakarnis, T. S., M. I. Boyanov, K. M. Kemner, B. Mishra, **E. J. O'Loughlin**, G. Parkin, and M. M. Scherer. (2013). Influence of chloride and magnetite stoichiometry on the reduction of Hg^{II} reduction by magnetite. *Environmental Science and Technology*. 47(13):6987-6994, DOI: 10.1021/es304761u

Rui X., M. J. Kwon, **E. J. O'Loughlin**., S. Dunham-Cheetam , J. B. Fein, B. A. Bunker, K. M. Kemner, and M. I. Boyanov. (2013). Bioreduction of hydrogen uranyl phosphate: mechanisms and U(IV) products. *Environmental Science and Technology*. 47(11):5668-5678. DOI: 10.1021/es305258p

Latta, D. E., M. I. Boyanov, K. M. Kemner, **E. J. O'Loughlin,** and M. M. Scherer. (2012). Abiotic reduction of uranium by Fe(II) in soil. *Applied Geochemistry.* 27(8):1512-1524. DOI: 10.1016/j.apgeochem.2012.03.003

Latta, D. E., C. A. Gorski, M. Boyanov, **E. J. O'Loughlin**, K. M. Kemner, M. M. Scherer. (2012). Influence of magnetite stoichiometry on U^{VI} reduction. *Environmental Science and Technology*. 46(2):778-786. DOI:10.1021/es2024912

Mishra, B., **E. J. O'Loughlin,** M. I. Boyanov, and K. M. Kemner. (2011). Binding of Hg^{II} to high affinity sites on bacteria inhibits reduction to Hg^0 by mixed $Fe^{II/III}$ phases. *Environmental Science and Technology*. 45(22):9597-9603. DOI:10.1021/es201820c

Boyanov, M. I., K. E. Fletcher, M. J. Kwon, X. Rui, **E. J. O'Loughlin**, F. E. Löffler, and K. M. Kemner. (2011). Solution and microbial controls on the formation of reduced U(IV) phases. *Environmental Science and Technology*. 45(19):8336-8344. DOI:10.1021/es2014049

O'Loughlin, E. J., M. I. Boyanov, D. A. Antonopoulos, and K. M. Kemner. (2011). Redox processes affecting the speciation of technetium, uranium, neptunium, and plutonium in aquatic and terrestrial environments. In *Aquatic Redox Processes*; P.G. Tratnyek, T. J. Grundl, and S. Haderlein, Eds. American Chemical Society, Washington DC, pp 477-517, DOI: 10.1021/bk-2011-1071.ch022 **(Invited)**.

Kwon, M. J., **E. J. O'Loughlin,** D. Antonopoulos, and K. T. Finneran. (2011). Geochemical and microbiological processes contributing to the transformation of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in contaminated aquifer material. *Chemosphere.* 84:1223-1230.

O'Loughlin, E. J., C. Gorski, M. M. Scherer, M. I. Boyanov, and K. M. Kemner. (2010). Effects of oxyanions, natural organic matter, and bacterial cell density on the bioreduction of lepidocrocite (γ-FeOOH) and secondary mineral formation. *Environmental Science and Technology*. 44(12):4570-4576.

O'Loughlin, E. J., S. D. Kelly, and K. M. Kemner. (2010). XAFS investigation of the interactions of U^{VI} with secondary mineralization products from the bioreduction of Fe^{III} oxides. *Environmental Science and Technology*. 44(5):1656-1661.

Kelly, S. D., W.-M. Wu, F. Yang, C. Criddle, T. L. Marsh, **E. J. O'Loughlin,** B. Ravel, D. Watson, P. M. Jardine, and K. M. Kemner. (2010). Uranium transformations in static microcosms. *Environmental Science and Technology*. 44(1):236-242.

Boyanov, M.I., **E. J. O'Loughlin**, and K. M. Kemner. (2009). Iron phase transformations resulting from the respiration of *Shewanella putrefaciens* on a mixed mineral phase. *Journal of Physics Conference Series.* 190:012193.

O'Loughlin, E. J. (2008). Effects of electron transfer mediators on the bioreduction of lepidocrocite (γ-FeOOH) by *Shewanella putrefaciens* CN32. *Environmental Science and Technology*. 42(18):6876-6882.

Boyanov, M.I., **E. J. O'Loughlin**, E. E. Roden, J. B. Fein, and K. M. Kemner. (2007). Adsorption of Fe(II) and U(VI) to carboxyl-functionalized microspheres: the influence of speciation on uranyl reduction studied by titration and EXAFS. *Geochimica et Cosmochimics Acta.* 71:1898-1912.

O'Loughlin, E. J., P. Larese-Casanova, R. E. Cook, and M. M. Scherer. (2007). Green rust formation from dissimilatory iron reduction of γ-FeOOH (lepidocrocite): Comparison of several *Shewanella* species. *Geomicrobiology Journal.* 24:211-230.

Kemner, K. M., **E. J. O'Loughlin,** S. D. Kelly, and M. I. Boyanov. (2005). Synchrotron x-ray investigations of mineral-microbe-metal interactions and their effects on metal transformations. *Elements* 1:217-221.

Kemner, K. M., S. D. Kelly, **E. J. O'Loughlin**, T. Khare, L. A. Moe, B. G. Fox, M. I. Donelly, Y Londer, M. Schiffer, and C. S. Giometti.D. (2005). XRF and XAFS analysis of electrophoretically isolated nondenatured proteins. *Physica Scripta.* T115:94-942.

O'Loughlin, E.J., Y.-P. Chin. (2004). Quantification and characterization of sedimentary porewater dissolved organic carbon and iron from Green Bay, WI, USA. *Biogeochemistry.* 71(3):371-386.

Kemner, K. M., S. D. Kelly, B. Lai, J. Maser, **E. J. O'Loughlin**, D. Sholto-Douglas, Z. Cai, M. A. Schneegurt, C. F. Kulpa, and K. H. Nealson. (2004). X-ray microbeam analysis of bacteria: Elemental and redox determination of single cells. *Science.* 306:686-687.

Borrok, D., J. B. Fein, M. Tischler, **E. O'Loughlin**, K. M. Kemner, H. Meyer, and M. Liss. (2004). Effects of acidic solutions and growth conditions on the adsorptive properties of bacterial surfaces. *Chemical Geology.* 209:107-119.

O'Loughlin, E.J., and D. R. Burris. 2004. Reduction of halogenated ethanes by green rust. *Environmental Toxicology and Chemistry.* 23:41-48.

O'Loughlin, E.J., H. Ma, and D.R. Burris. 2004. Catalytic effects of Ni-humic complexes on the reductive dehalogenation of C_1 and C_2 chlorinated hydrocarbons. In E.A. Ghabbour and G. Davies (Eds.), *Humic Substances: Nature's Most Versatile Materials*. Taylor and Francis, Inc., New York, pp. 297-324.

O'Loughlin, E.J., S.D. Kelly, K.M. Kemner, R. Cesncsits, and R.E. Cook. 2003. Reduction of Ag^{I}, Au^{III}, Cu^{II}, and Hg^{II} by Fe^{II}/Fe^{III} hydroxysulfate green rust. *Chemosphere* 53: 437-446.

O'Loughlin, E.J., K.M. Kemner, and D. R. Burris. 2003. Effects of Ag^{I}, Au^{III}, and Cu^{II} on the reductive dechlorination of carbon tetrachloride by green rust. *Environmental Science and Technology*. 37: 2905-2912.

O'Loughlin, E.J., S.D. Kelly, R.E. Cook, R. Csencsits and K.M. Kemner. 2003. Reduction of uranium(VI) by mixed Fe(II)/Fe(III) hydroxide (green rust): Formation of UO_2 nanoparticles. *Environmental Science and Technology*. 37: 721-727.

Ma, H., **E.J. O'Loughlin**, and D.R. Burris. 2001. Factors affecting humic-nickel complex mediated reduction of trichloroethene in homogeneous aqueous solution. *Environmental Science and Technology*. 35: 717-724.

O'Loughlin, E.J., Y.-P. Chin. 2001. Effect of detector wavelength on the determination of the molecular weight of humic substances by high pressure size exclusion chromatography. *Wat. Res.* 35: 333-338.

O'Loughlin, E.J., and D.R. Burris. 2000. Reductive dehalogenation of trichloroethene mediated by wetland DOC-transition metal complexes. In J.L. Means and R.E. Hinchee (Eds.), *Wetlands and Remediation*. Battelle Press, Columbus, OH, pp. 1-8.

O'Loughlin, E.J., Y.-P. Chin, and S.J. Traina. 2000. Association of organotin compounds with aquatic and terrestrial humic substances. *Environmental Toxicology and Chemistry.* 19: 2015-2021.

O'Loughlin, E.J., S.J. Traina, and G.K. Sims. 2000. Effects of sorption on the biodegradation of 2-methylpyridine. *Environmental Toxicology and Chemistry.* 19: 2168-2174.

O'Loughlin, E. J., D. R. Burris, and C. A. Delcomyn. 1999. Reductive dechlorination of trichloroethene mediated by humic-metal complexes. *Environmental Science and Technology*. 33: 1145-1147.

O'Loughlin, E.J., G.K. Sims, and S.J. Traina. 1999. Biodegradation of 2-methyl, 2-ethyl, and 2-hydroxypyridine by an *Arthrobacter* sp. isolated from subsurface sediment. *Biodegradation* 10: 93-104.

O'Loughlin, E.J., S. Kehrmeyer, and G.K. Sims. 1996. Isolation, characterization, and substrate utilization of a quinoline degrading microorganism. *International Biodeterioration and Biodegradation.* 38: 107-118.

Chin, Y. P., G. Aiken, and **E. O'Loughlin**. 1994. Molecular weight, polydispersivity, and spectroscopic properties of aquatic humic substances. *Environmental Science and Technology.* 28: 1853-1858.

Sims, G.K. and **E.J. O'Loughlin**. 1992. Riboflavin production during growth of *Micrococcus luteus* on pyridine. *Applied and Environmental Microbiology* 59: 3423-3425.

Sims, G.K. and **E.J. O'Loughlin**. 1989. Degradation of pyridines in the environment. *CRC Critical Reviews in Environmental Control.* 19(4):309-340.

Invited Presentations

O'Loughlin, E. 2012. Microbial Fe(III) Oxide Bioreduction: Secondary Mineralization Pathways, *Princeton University,* Princeton, NJ.

O'Loughlin, E. J., M. I. Boyanov, K. Skinner, B. Mishra, S. D. Kelly, W.-M. Wu, C. Criddle, M. Mueller, T. Melhorn, D. Watson, S. Brooks, and K. Kemner. 2012. XRF imaging and XAFS analysis of uranium dynamics in biostimulated field-site sediments. *243rd American Chemical Society National Meeting*, San Diego, CA.

O'Loughlin, E. 2011. Uranium transformations by coupled microbial and geochemical processes: Rust-breathing bacteria and our Cold War legacy, *Northwestern University,* Evanston, IL.

O'Loughlin, E. J. 2011. Biogeochemical factors controlling green rust formation and contaminant reduction. *2011 International Workshop on Subsurface Biogeochemistry,* Gangneung, Korea.

O'Loughlin, E.J., M.I. Boyanov, M.J. Kwon, P.E. Long, K.H. Williams, and K.M. Kemner. 2011. Effects of microbial activity and electron shuttles on the reduction of U(VI) under sulfidogenic conditions. *21st Annual Goldschmidt Conference,* Prague, Czech Republic.

O'Loughlin, E. 2010. Effects of Electron Shuttles on Microbial Community Development and U transformations under Fe(III)- and Sulfate- Reducing Conditions, *University of Illinois, Chicago.*

O'Loughlin, E. 2009. Microbial and geochemical controls on biogenic Fe(II) speciation and reactivity. *Department of Civil and Environmental Engineering, University of Iowa.*

O'Loughlin, E. 2008. Uranium Transformations by Coupled Microbial and Geochemical Processes: U(VI) Uptake and Reduction by Fe(II)-Bearing Minerals Produced During the Bioreduction of Fe(III) Oxides by Dissimilatory Iron-Reducing Bacteria. *Department of Civil and Environmental Engineering Seminar Series, University of Missouri-Columbia*

O'Loughlin, E. 2007. Microbial and geochemical controls on biogenic Fe(II) speciation and reactivity: Rust-breathing bacteria and our Cold War legacy. *Biology Department Seminar Series, Hamilton College*

O'Loughlin, E., and K. Kemner. 2007. Investigations of coupled biogeochemical processes affecting the transformation of U: Integration of synchrotron-based approaches. *DOE-ERSP PI Workshop, Lansdown, VA.*

O'Loughlin, E. 2006. Transformation of U(VI) under iron-reducing conditions. *DOE-ERSP PI Workshop, Warrenton, VA.*

O'Loughlin, E., S.D. Kelly, K.M. Kemner and D.R. Burris. 2002. Reduction of organic and inorganic contaminants by Green Rust. *Department of Civil and Environmental Engineering, University of Iowa.*

O'Loughlin, E., H. Ma, and D. Burris. 2002. Catalytic effects of Ni-humic complexes on the reductive dehalogenation of chlorinated alkanes and alkenes. *International Humic Substances Society 20th Anniversary Conference,* Boston, MA.

O'Loughlin, E., S.D. Kelly, K.M. Kemner and D.R. Burris. 2002. Organic and inorganic contaminant reduction by Green Rust. *Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign.*

O'Loughlin, E., S.D. Kelly, K.M. Kemner and D.R. Burris. 2001. Organic and inorganic contaminant reduction by Fe(II)/Fe(III) hydroxysulphate green rust. *United States Geological Survey,* Menlo Park, CA.

O'Loughlin, E., H. Ma, and D. Burris. 2000. Reductive dehalogenation of chlorinated hydrocarbons mediated by humic-nickel complexes. *Environmental Research Division Seminar, Argonne National Laboratory,* Argonne, IL.

O'Loughlin, E., Y.-P. Chin, and S. Traina. 2000. Binding of organotin compounds by humic substances. *Parametrix,* Kirkland, WA.

O'Loughlin, E.J., S.J. Traina, and G.K. Sims. 1997. Effects of adsorption on the biodegradation of 2-methylpyridine. *DuPont Agricultural Products,* Wilmington, DE.

General Symposia Presentations

Flynn, T. M., D. A. Antonopoulos, K. M. Handley, M. J. Kwon, D. Bartels, M. I. Boyanov, F. Meyer, B. Mishra, W. L. Trimble, K. M. Kemner, P. Long, K. Williams, T. J. DiChristina, and **E. J. O'Loughlin**. 2014. Interconnected Cycling of Fe, S, and C in the Terrestrial Subsurface: New Paths and Opportunities for Coupling Biotic and Abiotic Processes. *Ninth International Symposium on Subsurface Microbiology,* Pacific Grove, CA.

Flynn, T. M., **E. J. O'Loughlin**, B. Mishra, T. J. DiChristina, and K. M. Kemner. 2014. Sulfur-mediated electron shuttling during bacterial iron reduction. *Ninth International Symposium on Subsurface Microbiology,* Pacific Grove, CA.

O'Loughlin, E. J., M. I. Boyanov, C. A. Gorski, M. L. McCormick, M. M. Scherer, and K. M. Kemner. 2014. Dissimilatory iron reduction and the redox cycling of green rust. *Ninth International Symposium on Subsurface Microbiology,* Pacific Grove, CA.

Alvarez-Clare, S., **E. J. O'Loughlin, E. J.**, T. M. Flynn, and D. A. Antonopoulos. 2014. Influence of nutrient availability on greenhouse gas emissions and microbial community composition in a lowland tropical rainforest. *6th Annual Argonne Soil Metagenomics Workshop,* Lake Charles, IL.

O'Loughlin, E. J., T. M. Flynn, J. C. Koval, S. M. Owens, K. Arend, and D. A. Antonopoulos. 2014. Effects of 2-chloro-6-methylpyridine concentration on microbial community development during aerobic methane oxidation. *6th Annual Argonne Soil Metagenomics Workshop,* Lake Charles, IL.

Johnson, C. R., M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. 2014. Behavior of antimony(V) under sulphate-reducing conditions. *2014 Midwest Geobiology Symposium, Chicago*, IL.

Kwon, M. J., J.-S. Yang, M. J. Shim, M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. 2014. Acid extraction overestimates total Fe(II) in the presence of Fe(III) oxide and Fe(II) sulphide minerals. *2014 Midwest Geobiology Symposium, Chicago*, IL.

Boyanov, M. I., D. E. Latta, B. Mishra, R. Cook, **E. J. O'Loughlin**, and K. M. Kemner. 2014. Uptake, reduction, and reoxidation mechanisms of uranium in biogeochemical systems studied by x-ray absorption spectroscopy. *Synchrotron Environmental Science VI,* Argonne, IL.

O'Brien, S. L., M. D. Whiteside, D. Sholto-Douglas, D. A. Antonopoulos, M. I. Boyanov, D. M. Durall, M. D. Jones, B. Lai, **E. J. O'Loughlin**, and K. M. Kemner. 2014. A novel nanoparticle approach for imaging soil bacteria. *Synchrotron Environmental Science VI,* Argonne, IL.

Johnson, C. R., M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. 2014. Reduction of antimony(V) by iron(II) minerals. *Synchrotron Environmental Science VI,* Argonne, IL.

Flynn, T. M., **E. J. O'Loughlin**, B. Mishra, T. J. DiChristina, and K. M. Kemner. 2014. Sulfur-mediated electron shuttling during bacterial iron reduction. *Synchrotron Environmental Science VI,* Argonne, IL.

Mishra, B., **E. J. O'Loughlin**, W. T. Cooper, J. Jastrow, R. Gordon, M. Balasubramanian, and K. M. Kemner. 2014. Why should we study carbon chemistry using X-ray Raman? *Synchrotron Environmental Science VI,* Argonne, IL.

Kwon, M. J., J.-S. Yang, M. J. Shim, M. I. Boyanov, K. M. Kemner, and **E. J. O'Loughlin**. 2014. Acid extraction overestimates total Fe(II) in the presence of Fe(III) oxide and Fe(II) sulphide minerals. *Synchrotron Environmental Science VI,* Argonne, IL.

K.M. Kemner, K. M. , B. Mishra, **E. J. O'Loughlin**, M. I. Boyanov, S. O'Brien, V. Bailey and A. Konopka. 2014. Synchrotron-based characterization at the APS to determine physical and chemical characteristics of carbon in the subsurface and root zones to improve earth system modelling of the biogeochemical cycling of carbon. *Complex Soil Systems Conference,* Berkeley, CA.

Mishra, B., **E. J. O'Loughlin,** W. T. Cooper, J. Jastrow, R. Gordon, M. Balasubramanian, and K. M. Kemner. 2014. Carbon chemistry in unaltered soil samples using nonresonant inelastic X-ray scattering. *Complex Soil Systems Conference,* Berkeley, CA.

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Pasakarnis, T. S., C. A. Gorski, **E. O'Loughlin**, G. F. Parkin, and M. M. Scherer. 2006. Abiotic reduction of chlorinated ethenes in the presence of anaerobic bacteria. *231st American Chemical Society National Meeting*, Atlanta, GA.

O'Loughlin, E. J., S. Kelly, R. E. Cook, P. Larese Casanova, M. M. Scherer, and K. M. Kemner. 2006. Transformation of uranium under Fe(III)-reducing conditions: Reduction of U(VI) by biogenic Fe(II)/Fe(III) hydroxide (green rust). *231st American Chemical Society National Meeting*, Atlanta, GA.

St. Clair, M., S. L. Smith, J. O. Harrison, **E. J. O'Loughlin**, K. M. Kemner, M. I. Boyanov, and M. M. Scherer. 2006. U(VI) reaction with green rusts: Influence of anions. *231st American Chemical Society National Meeting*, Atlanta, GA.

O'Loughlin, E. J., P. Larese-Casanova, R. E. Cook, and M. M. Scherer. 2006. Comparison of dissimilatory iron reduction of lepidocrocite among *Shewanella* species. *106th General Meeting, American Society for Microbiology*, Orlando, FL.

Khare, T., **E.J. O'Loughlin,** S.L. Tollaksen, C.B. Lindberg, N. VerBerkmoes, M. Shah, M. Thompson, R. Hettich, and C.S. Giometti. 2006. Proteomic analysis of *Shewanella oneidensis* MR-1 grown on insoluble iron oxides. *106th General Meeting, American Society for Microbiology*, Orlando, FL.

O'Loughlin, E., P. Larese Casanova, R. Cook, and M. Scherer. 2005 Biogenic green rust formation from dissimilatory iron reduction of lepidocrocite: Comparison of several *Shewanella* species. *The Joint International Symposia for Subsurface Microbiology (ISSM 2005) and Environmental Biogeochemistry (ISEB XVII)*, Jackson Hole, WY.

Khare, T., N. Verberkmoes, C. Y. Sanville-Millard, W. Zhu, **E. J. O'Loughlin**, M. Thompson, J. Yates, K. M. Kemner, M. Donnelly, R. Hettich, and C. S. Giometti. 2005. Identification and characterization of *Shewanella oneidensis* MR1 surface proteins. *105th General Meeting, American Society for Microbiology,* Atlanta, GA.

Boyanov, M. I., **E. J. O'Loughlin**, S. K. Kelly, J. B. Fein, E. E. Roden, and K. M. Kemner. 2005. Reduction of U(VI) by adsorbed vs. surface-precipitated Fe(II) at model cell surfaces. *15th Annual Goldschmidt Conference,* Moscow, ID.

Meyer, H. P., **E. J. O'Loughlin**, D. J. Sholto-Douglas, and K. M. Kemner. 2004. Electron donor effects on the reduction of AQDS by several *Shewanella* species. *104th General Meeting, American Society for Microbiology,* New Orleans, LA.

Sholto-Douglas, D. J., H. Meyer, M. Donnelly, **E. J. O'Loughlin**, E. E. Roden, and K. M. Kemner. 2004. Investigation of dissimilatory iron reduction in a mixed culture of *Shewanella oneidensis* and *Geobacter sulfurreducens*. *104th General Meeting, American Society for Microbiology,* New Orleans, LA.

Kemner, K. M., S. D. Kelly, **E. J. O'Loughlin**, T. Khare, L. A. Moe, B. G. Fox, M. I. Donelly, Y Londer, M. Schiffer, and C. S. Giometti. D. 2003. XRF and XAFS analysis of electrophoretically isolated nondenatured proteins. *The 12th International Conference on X-ray Absorption Fine Structure,* Malmö, Sweden.

Tischler, M., H. Meyer, K. Kemner, **E. O'Loughlin**, D. Sholto-Douglas, J. Fein. 2003. Adsorption of cobalt to the surface of bacteria. *103rd General Meeting, American Society for Microbiology,* Washington, DC.

Kemner, K. M., S. D. Kelly, **E. J. O'Loughlin**, J. F. Banfield, J. D. Coates, J. B. Fein, D. A. Fowle, and Y. Suzuki. 2002. X-ray investigations of uranium-mineral-microbe interactions. *2002 ASA-CSSA-SSSA Annual Meeting*, Indianapolis, IN.

O'Loughlin, E. J., S. D. Kelly, K. M. Kemner, R. Csencsits, and R. E. Cook. 2002 Reduction of uranium(VI) by Fe(II)/Fe(III) hydroxy sulfate (green rust): Formation of UO_2 nanoparticles. *Gordon Research Conference/Environmental Sciences:Water*, Plymouth, NH

Tischler, M. L., M. Liss, J. Fein, K. Kemner, **E. O'Loughlin**, and D. Sholto-Douglas. 2002. Adsorption of cadmium and cobalt to *Pseudomonas fluorescens* and *Shewanella oneidensis* MR-1. *102nd General Meeting, American Society for Microbiology,* Salt Lake City, UT.

Kemner, K.M., S.D. Kelly, **E.J. O'Loughlin,** Y.Suzuki, J. Banfield, and J. Coates. 2002. X-Ray absorption spectroscopy studies of U(VI) interactions with minerals and microbes. *223rd American Chemical Society National Meeting*, Orlando, FL.

O'Loughlin, E. J., S. D. Kelly, K. M. Kemner. 2001. Mercury reduction by mixed Fe(II)/Fe(III) hydroxide (Green Rust). *22nd Annual North American Meeting of the Society of Environmental Toxicology and Chemistry,* Baltimore, MD.

O'Loughlin, E. J., S. D. Kelly, K. M. Kemner, and D. R. Burris. 2001. XAFS study of the catalytic effects of Ag, Au, and Cu on the reductive dechlorination of carbon tetrachloride by green rust. *222nd American Chemical Society National Meeting*, Chicago, IL.

Kelly, S. D., K. M. Kemner, **E. J. O'Loughlin**, J. B. Fein, D. A. Fowle, M. I. Boyanov, B. A. Bunker, N. Yee, and J. D. Coates. 2001. XAFS investigations of interactions of U(VI) with *Bacillus subtilis,* green rust, and bio-oxidizing *Dechlorosomas suillum*. *222nd American Chemical Society National Meeting*, Chicago, IL.

O'Loughlin, E. J., S. D. Kelly, M. Boyanov, and K. M. Kemner. 2001. Reduction of Cu(II) and U(VI) by mixed Fe(II)/Fe(III) hydroxide (Green rust). *6th International Conference on the Biogeochemistry of Trace Elements*, Guelph, Ontario.

O'Loughlin, E. J., S. D. Kelly, M. Boyanov, and K. M. Kemner. 2001. Reduction of trace elements by mixed Fe(II)/Fe(III) hydroxide (Green rust). *221st American Chemical Society National Meeting*, San Diego, CA.

O'Loughlin, E., and D. Burris. 2000. Reductive transformation of halogenated hydrocarbons by green rust. *220th American Chemical Society National Meeting*, Washington, D.C.

O'Loughlin, E., and D. Burris. 2000. Reductive dechlorination of carbon tetrachloride by Cu amended Green Rust. *219th American Chemical Society National Meeting*, San Francisco, CA.

O'Loughlin, E., and D. Burris. 1999. Reductive dehalogenation of chlorinated hydrocarbons mediated by humic-nickel complexes. *20th Annual Meeting of the Society of Environmental Toxicology and Chemistry,* Philadelphia, PA.

Ma, H., **E. O'Loughlin**, and D. Burris. 1999. Abiotic reductive dechlorination of PCE and TCE in the presence of aquatic humic substances. *20th Annual Meeting of the Society of Environmental Toxicology and Chemistry,* Philadelphia, PA.

Burris, D., and **E. O'Loughlin**. 1999. Reductive dehalogenation of trichloroethene mediated by wetland DOC-transition metal complexes. *Wetlands and Remediation: An International Conference*, Salt Lake City, UT.

O'Loughlin, E., and D. Burris. 1998. Transformation of trichloroethylene mediated by humic complexes. *216th American Chemical Society National Meeting*, Boston, MA.

O'Loughlin, E., and D. Burris. 1998. Reductive dechlorination of trichloroethene mediated by humic acid-Ni complexes, *Gordon Research Conference/Environmental Sciences:Water*, Henniker, NH.

O'Loughlin, E., Y.-P. Chin, and S. Traina. 1998. Binding of organotin compounds by humic substances. *215th American Chemical Society National Meeting*, Dallas, TX.

O'Loughlin, E., S. Traina, and Y.-P. Chin. 1997. Sorption of tributyltin by aquatic humic substances. *18th Annual Meeting of the Society of Environmental Toxicology and Chemistry,* San Francisco, CA.

O'Loughlin, E., and Y.-P. Chin. 1996. Association of organotin compounds with aquatic humic substances. Poster presentation, *Gordon Research Conference/Environmental Sciences:Water*, New Hampton, NH.

O'Loughlin, E., and S. Traina. 1995. Biodegradation of ortho-substituted pyridine derivatives by an *Arthrobacter* sp. *Sixteenth Annual Midwest Environmental Chemistry Workshop*, October 7-8, Ohio State University, Columbus, OH.

Chin, Y.-P., and **E. J. O'Loughlin**. 1995. Quantification and characterization of porewater organic carbon from lacustrine sediments. 5th V.M. *Goldschmidt Conference*, May 24-26, Pennsylvania State University, University Park, PA.

O'Loughlin, E. J., and Y.-P. Chin. 1995. Effect of detector wavelength on the determination of the molecular weight of humic substances by high pressure size-exclusion chromatography. *209th American Chemical Society National Meeting*, Anaheim, CA.

Danielsen, K. M., **E. O'Loughlin**, and Y.-P. Chin. 1994. The molecular weight, aromaticity, and nonpolar organic compound binding properties of aquatic humic substances. Poster presentation, *Gordon Research Conference/Environmental Sciences:Water*, New Hampton, NH.

Chin, Y.-P., G. Aiken, and **E. O'Loughlin**. 1994. The size and bulk spectroscopic properties of aquatic humic substances. *207th American Chemical Society National Meeting*, San Diego, CA.

O'Loughlin, E., S. Traina, and P. Gu. 1993. Sorption of alachlor by subsurface sediments from the Ohio MSEA site. *Soil Science Society of America*, Cincinnati, OH.

Chin, Y.-P., G. Aiken, and **E. O'Loughlin**. 1993. On the molecular weight, polydispersivity, and spectroscopic properties of aquatic humic substances. *Sixteenth Annual Midwest Environmental Chemistry Workshop*, October 17-18, University of Notre Dame, Notre Dame, IN.

O'Loughlin, E., Y. Xue, S. Traina, and M. Jagucki. 1993. Sorption of atrazine by Ohio MSEA soil and subsurface sediment samples. *Conference on Agricultural Research to Protect Water Quality,* February 21-24, Minneapolis, MN. Sponsored by the Soil and Water Conservation Society.

O'Loughlin, E., G. Sims, and S. Traina. 1992. Characterization of a 2-methylpyridine degrading bacterium isolated from subsurface sediments. *92nd General Meeting, American Society for Microbiology,* New Orleans, LA.

O'Loughlin, E. J., S. J. Traina, and G. K. Sims. 1991. Effects of adsorption on the biodegradation of 2-methylpyridine. *Soil Science Society of America*, Denver, CO.

Sims, G. K., M. R. Brill, C. J. Staron, **E. J. O'Loughlin**, and M. L. Prichard. 1990. Biodegradation of *N*-heterocycles in contaminated subsurface sediments. *Soil Science Society of America*, San Antonio, TX.

O'Loughlin, E. J., S. R. Kehrmeyer, and G. K. Sims. 1989. Isolation, characterization, and substrate utilization of a quinoline degrading microorganism. *Soil Science Society of America*, Las Vegas, NV.

O'Loughlin, E. J., and G. K. Sims. 1988. Pigment production during growth of *Micrococcus luteus* on pyridine. *Ohio Academy of Science,* Newark, OH.

O'Loughlin, E., G. K. Sims, and S. J. Traina. 1988. Effects of complexation and surface attenuation on biodegradation of aromatic xenobiotic compounds. Soil Sci. Soc. Am. Anaheim, CA.

Traina, S. J., D. Spontak, and **E. O'Loughlin**. 1987. Effect of cationic composition on pesticide complexation by dissolved organic carbon. *Soil Science Society of America*, Atlanta, GA.

O'Loughlin, E. and P. Olynyk. 1986. Heavy metals in Lake Erie water and sediments. *American Chemical Society, Cleveland Section*, Cleveland, OH.

Awards Received

Argonne National Laboratory Pacesetter Award 2010
National Research Council Postdoctoral Fellowship 1997-2000
Ohio State University Presidential Fellowship 1995
Graduate Student Award American Chemical Society Division of Environmental Chemistry 1995
Sigma Xi Grant-in-Aid of Research 1994
Gamma Sigma Delta (Honor Society of Agriculture) 1989

Professional and Technical Societies

American Chemical Society (ACS)
American Society for Microbiology (ASM)
American Geophysical Union (AGU)
International Humic Substances Society (IHSS)
International Society for Subsurface Microbiology (ISSM)
Mineralogical Society of America (MSA)

Professional Service

Ad Hoc Manuscript Reviewer, 1997-present for: *Environmental Science and Technology, Applied and Environmental Microbiology, Geochimica et Cosmochimica Acta, Geomicrobiology Journal, Chemical Geology, Applied Geochemistry, Clays and Clay Minerals, Water Research, Biogeochemistry, Biodegradation, Letters in Applied Microbiology, Chemosphere, International Biodeterioration and Biodegradation, Annales de Limnologie, Inorganic Chemistry, Journal of Physical Chemistry, Soil Science Society of America Journal, Critical Reviews in Environmental Science and Technology, Journal of Environmental Management, Chemical Reviews, Journal of Hazardous Materials, Chemistry and Ecology, PLoS ONE,* and *Industrial and Engineering Chemistry Research*.

Symposium Organizer
"Carbon Dynamics and the Biogeochemical Cycling of Major and Minor Elements", Environmental Chemistry Division Symposium at the 245th American Chemical Society National Meeting, New Orleans, LA , April 7-11, 2013.

"Spectroscopic Identification of Interfacial Chemical Species in Natural and Engineered Environments", Environmental Chemistry Division Symposium at the 244th American Chemical Society National Meeting, Philadelphia, PA , August 19-23, 2012.

"Abiotic and Biotic Factors Affecting Contaminant Transformation at Iron Oxide Surfaces", Environmental Chemistry Division Symposium at the 233rd American Chemical Society National Meeting, Chicago, IL , March 25-29, 2007.

Workshop Organizer
"Probing the Interface between Biological Systems and the Environment", 2012 APS/CNM/EMC Users Meeting, Argonne National Laboratory, Argonne, IL, May 7-10, 2012.

"Challenges in Environmental Molecular Microbiology", Argonne National Laboratory, Argonne, IL, April 26-27, 2010.

Review Panel Member, 2007. U.S. Department of Energy Environmental Remediation Science Program.

Ad Hoc Proposal Reviewer, National Science Foundation, 2003-present, Biogeosciences, OISE-Global Scientists and Engineers, and OISE-International Research Fellows Program.

Ad Hoc Proposal Reviewer, Stanford Synchrotron Radiation Laboratory General User Program, 2005-present.

External Examiner, 2005, for the M.S. thesis of Justine Harrison, Department of Civil and Environmental Engineering, University of Iowa, Iowa City, USA and 2010, for the Ph.D. dissertation of Drew Latta, Department of Civil and Environmental Engineering, University of Iowa, Iowa City, USA.

Service to Argonne National Laboratory

Safety Committee Member, 2007-present, Biosciences Division

Microbiologist Search Committee Member, 2012-2013, Biosciences Division

Bio/Environmental Working Group, 2006.

Library Committee Member, 2004-present, representing the Environmental Research and Biosciences Divisions

Seminar Committee Member, 2004-2005, Environmental Research Division

Certifications

Completed 40 hour course in Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training for certification by the Occupational Safety and Health Administration as a HAZMAT technician.

Post Docs advised

Christopher Marshall 2013-present
Silvia Alvarez-Clare 2012-present
Ted Flynn 2011-2013
Drew Latta 2011-2013
Man Jae Kwon 2009-2010
Bhoopesh Mishra 2009-2011
Maxim Boyanov 2003-2006

Summer Undergraduate Interns advised

Clayton Johnson 2014
Katheryn Fenske 2007
Haley Meyer 2003, 2004
Quinn Clancy 2011