

Robin J. (Rob) Reash

Contact:

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Education:

B.A., Biology (*cum laude*), Wittenberg University, 1981
Marine Biology and Oceanography training, Duke University Marine Laboratory, 1981
M.S., Environmental Biology, The Ohio State University, 1984

Work Experience:

Environmental Consultant, 1984
Fisheries Intern, Ohio Environmental Protection Agency, 1984
Aquatic Biologist, American Electric Power, 1984-1988
Environmental Scientist, Oklahoma Water Resources Board, 1989
Principal Environmental Scientist, American Electric Power, 1990 to 2019

Recent Leadership Activities:

Associate Editor, *Integrated Environmental Assessment and Management* journal,
2020 to present
Chairman, Electric Power Research Institute (EPRI) Water Quality Research Program,
2010 - 2019
Chairman, Utility Water Act Group (UWAG) Water Quality Committee, 2005 - 2019
Chairman, ORSANCO Power Industry Advisory Committee, 2004 - 2019
Leader, Utility Water Act Group Selenium and Section 316(a) workgroups, 2009 - 2019
Member, North American Selenium Working Group (National Metals Council), 2010 – 2019.
Chairman, Ohio Utility Group (OUG) Water Task Force, 2011 - 2019

Recent and Historical Research Projects:

Derivation of site-specific selenium WQC at Ohio River power plant sites.
Speciation of mercury in power plant waste streams and ambient water
Development of a site-specific whole effluent toxicity criterion for a southeastern Ohio
receiving stream
Use of fish otolith microchemistry to evaluate exposure to trace metals in receiving
streams
Assessment of mercury, methylmercury, and selenium levels in Ohio River fish collected
near coal-fired power plants
Evaluation of a site-specific human health criterion for mercury based on U.S. EPA's
methylmercury fish tissue criterion

WERF (Water Environment Research Foundation) Experience:

PSC (Project Subcommittee) chairman for “Validation of Underlying Assumptions for Integrating Frequency, Magnitude, and Duration in NPDES Permit Conditions”, WERF Project 02-WSM-3
PSC member for “Validation Study Using Instream Biological Assessments to Evaluate Urban and Watershed-Scale Use Attainment”, WERF Project 01-WSM-03
PSC member for “Effluent Limits for Fluctuating Discharges”, WERF Project 98-HHE-3

Other Experience:

Steering Committee, Electric Power Research Institute Thermal Ecology and Regulation Workshop, 2003, 2007, 2011, 2014
Member, Ohio EPA nutrient strategy point-source workgroup, 2012 - 2014
Invited to participate as external reviewer of recovery studies related to TVA Kingston Plant coal ash spill, 2010
SETAC Pellston Workshop Participant – Ecological Risk Assessment of Selenium, February 2009
Planning committee member, 2006 International Conference on Mercury as a Global Pollutant, Madison, WI
Planning committee member, steering group for SETAC workshop on environmental indicators of reduced mercury emissions from combustion sources, 2002 – 2003
External peer reviewer for U.S. EPA’s “Draft Revised Aquatic Life Criteria for Selenium”, 2002
Member, U.S. EPA Science Advisory Board Aquatic Life Criteria Consultant Panel, 2005
Member, peer review group for ORSANCO temperature water quality criteria re-evaluation, 2001 - 2006
Member, ORSANCO Ohio River biocriteria development advisory committee, 1997 – 2002
President, Society of Environmental Toxicology and Chemistry, Ohio Valley Chapter, 1992-1993

Honors and Professional Certification:

Certified Fisheries Professional (American Fisheries Society), 1998 to present
Electric Power Research Institute, Technology Transfer Award for implementing the Dynamic Mercury Cycling Model (D-MCM) for the Ohio River, 2015
Electric Power Research Institute, Technology Transfer Award for managing a long-term biological monitoring program for the Ohio River, 2014
Electric Power Research Institute, Technology Transfer Award for development of methylmercury sampling methodologies, 2012
Electric Power Research Institute, Technology Transfer Award for planning of thermal biology and regulation workshop, 2005
Steven J. Koerse Award of Excellence, Utility Water Act Group, 2004
American Electric Power, Gold Star Award for Environmental Achievement, 2000

Invited Presentations:

“Ecological Impacts from Coal Combustion Wastes”, Presented at National Research Council, Committee on Mine Placement of Coal Combustion Wastes public hearing, April 19, 2005.

Course Instructor

“Coal Combustion Byproducts: Chemistry, Toxicity and Environmental Risk”. Short course presented at Society of Environmental Toxicology and Chemistry 2012 Annual Meeting, Long Beach, CA
“Mercury-Selenium Interactions: A Review of Biochemical Mechanisms, Bioaccumulation

Effects, and Human Health Risk Assessment Considerations”. Short course presented at Society of Environmental Toxicology and Chemistry 2014 Annual Meeting, Vancouver, BC.

Professional Memberships:

Society of Environmental Toxicology and Chemistry
American Fisheries Society
North American Selenium Working Group (National Metals Council)

Peer-Reviewed Technical Publications:

Reash, R.J. In Press. Energy and the Environment: Striking a Balance. Invited Editorial. *Integrated Environmental Assessment and Management*.

Reash, R.J., J. Thomas, and J.T. Vondruska. In Press. Derivation of site-specific selenium water quality criteria: a comparison of two methods and regulatory implications. *Integrated Environmental Assessment and Management*.

Reash, R.J. 2021. Invited book review. Salmon Feels the Heat: Capital at Risk from Investor Concentration in the Salmon Aquaculture Industry – Briefing Paper 2019. *Integrated Environmental Assessment and Management* 17: 660 – 661.

Reash, R.J., L.M. Friedrich, M.C. Bock, N. Halderon, and V. Palace. 2019. Selenium and mercury in freshwater fish muscle tissue and otoliths: a comparative analysis. *Environmental Toxicology and Chemistry* 38: 1467 - 1475.

Reash, R.J. 2019. Use real-world data to inform the national coastal and Great Lakes condition. *Integrated Environmental Assessment and Management* 15: 301 - 302.

Reash, R.J. 2018. Bioavailability of mercury in power plant wastewater and ambient river samples: evidence that the regulation of total mercury is not appropriate. *Integrated Environmental Assessment and Management* 15: 142 - 147.

Reash, R.J., L. Brown, and K.E. Merritt. 2015. Mercury and other trace elements in Ohio River fish collected near coal-fired power plants: interspecific patterns and consideration of consumption risks. *Integrated Environmental Assessment and Management* 11: 474 – 480.

DeForest, D., **R.J. Reash,** and J. Toll. 2013. Comment on “Wildlife and the Coal Waste Policy Debate: Proposed Rules for Coal Waste Disposal Ignore Lessons Learned from 45 Years of Coal Wildlife Poisoning”. *Environmental Science & Technology* 47: 11363-11364..

Reash, R.J. 2012. Selenium, arsenic, and mercury in fish inhabiting a fly ash exposure gradient: inter-specific bioaccumulation trends and elemental associations. *Environmental Toxicology and Chemistry* 31: 739 – 747.

Reash, R.J. 2012. Heat shock proteins: what are they, and do they have a role in assessing thermal tolerance? Pg. 8-1 to 8-6 in: Third Thermal Ecology and Regulation Workshop, Electric Power Research Technical 1025382. Palo Alto, CA.

Hodson, P.V., **Reash, R.J.,** S.P. Canton, P.V. Campbell, C.G. Delos, A. Fairbrother, N.P. Hitt, L.L. Miller, and H.M. Ohlendorf. 2010. Selenium Risk Characterization. pp. 233- 256 in: Chapman, P.M., Adams, W.K., Brooks, M.J., Delos, C.G., Luoma S.N., Maher, W.A., Ohlendorf, H.M., Presser, T.S., and Shaw, D.P. (editors). Ecological Assessment of Selenium in the Aquatic Environment. SETAC Press, Pensacola, FL, USA.

Reash, R.J. 2008. Laboratory vs. field thermal tolerances: a review and mechanisms explaining thermal tolerance plasticity. Pp. 9-3 – 9-12 in Proceedings: Second Thermal Ecology and Regulation Workshop, October 2-3, 2007. EPRI (Electric Power Research Institute) Technical Report 1016809. EPRI, Palo Alto, CA.

Wiener, J.G., R.A. Bodaly, S. S. Brown, M. Lucotte, M.C. Newman, D.B. Porcella, **R.J. Reash**, and E.B. Swain. 2007. Monitoring and evaluating trends in methylmercury accumulation in aquatic biota. Pp. 87-122 in Harris, R.C., R.P. Mason, M.W. Murray, **R.J. Reash**, and T. Saltman (editors), *Ecosystem Responses to Mercury Contamination: Indicators of Change*. Taylor and Francis Publishers, Boca Raton, FL.

Reash, R.J., T.W. Lohner, and K.V. Wood. 2006. Selenium and other trace metals in fish inhabiting a fly ash stream: implications for regulatory tissue thresholds. *Environmental Pollution* 142: 397-408.

Reash, R.J. 2004. Dissolved and total copper in a coal ash effluent and receiving stream: assessment of *in situ* biological effects. *Environmental Monitoring and Assessment* 96: 203-220.

Reash, R.J. 2004. In a nutshell: 15 years of biomonitoring and 316(a) permitting at two American Electric Power facilities on the Muskingum River. Pg. 8-1 to 8-10 in Proceedings from the EPRI Workshop on 316(a) Issues: Technical and Regulatory Considerations. EPRI (Electric Power Research Institute) Technical Report 1008476. EPRI, Palo Alto, CA.

Emery, E.B., T.P. Simon, F.H. McCormick, P.L. Angermeier, J.E. Deshon, C.O. Yoder, R.E. Sanders, W.D. Pearson, G.D. Hickman, **R.J. Reash**, and J.A. Thomas. 2003. Development of a multi-metric index for assessing the biological condition of the Ohio River. *Transactions of the American Fisheries Society* 132: 791 – 808.

Reash, R. 2002. An evaluation of USEPA's bioaccumulation factor for mercury: a regulated industry perspective. P. 36 in U.S. EPA. 2002. Proceedings and Summary Report: Workshop on the Fate, Transport, and Transformation of Mercury in Aquatic and Terrestrial Environments. EPA/625/R-02/005.

Brix, K.V., J.S. Volosin, W.J. Adams, **R.J. Reash**, R.G. Carlton, and D.O. McIntyre. 2001. Effects of sulfate on the acute toxicity of selenate to freshwater organisms. *Environmental Toxicology and Chemistry* 20: 1037-1045.

Lohner, T.W., **R.J. Reash**, V. E. Willet, and L.A. Rose. 2001. Assessment of tolerant sunfish populations (*Lepomis* sp.) inhabiting selenium-laden coal ash effluents. 1. Hematological and population level assessment. *Ecotoxicology and Environmental Safety* 50: 203-216.

Lohner, T.W., **R.J. Reash**, and M. Williams. 2001. Assessment of tolerant sunfish populations (*Lepomis* sp.) inhabiting selenium-laden coal ash effluents. 2. Tissue biochemistry evaluation. *Ecotoxicology and Environmental Safety* 50: 217-224.

Lohner, T.W., **R.J. Reash**, V. E. Willet, and J. Fletcher. 2001. Assessment of tolerant sunfish populations (*Lepomis* sp.) inhabiting selenium-laden coal ash effluents. 3. Serum chemistry and fish health indicators. *Ecotoxicology and Environmental Safety* 50: 225-232.

Reash, R.J., G.L. Seegert, and W.L. Goodfellow. 2000. Experimentally- derived upper thermal tolerances for redbreast sunfish: revised 316(a) variance conditions at two generating facilities in Ohio. *Environmental Science and Policy* 115: S191-S196.

Reash, R.J., T.W. Lohner, K.V. Wood, and V.E. Willet. 1999. Ecotoxicological assessment of bluegill sunfish inhabiting a selenium-enriched fly ash stream. **In:** *Environmental Toxicology and Risk Assessment: Eighth Volume*, ASTM STP 1364. D.S. Henshel, M.C. Black, and M.C. Harras, Eds. American Society for Testing and Materials, West Conshohocken, PA.

Reash, R.J., P.H. Loeffelman, J.E. Hollback, J. Tiell, and G. Martin. 1998. Now you can choose: treat mercury in water at \$10 million per pound or take Ohio EPA's statewide variance with pollution minimization. *Environmental Regulation and Permitting* 1998: 29 – 38.

Leonard, D., **R. Reash**, D. Porcella, A. Paralkar, K. Summers, and S. Gherini. 1995. Use of the mercury cycling model (MCM) to predict the fate of mercury in the Great Lakes. *Water, Air, and Soil Pollution* 80: 519 – 528.

Dobbs, M.G., J.L. Farris, **R.J. Reash**, D.S. Cherry, and J. Cairns. 1994. Evaluation of the resident species procedure for developing site-specific water quality criteria for copper in Blaine Creek, Kentucky. *Environmental Toxicology and Chemistry* 13: 963-967.

Reash, R.J., and J. Pigg. 1990. Physicochemical factors affecting the abundance and species richness of fishes in the Cimarron River. *Proceedings of the Oklahoma Academy of Science* 70: 23 – 28.

Reash, R.J., and T.M. Berra. 1989. Incidence of fin erosion and anomalous fishes in a polluted stream and a nearby clean stream. *Water, Air, and Soil Pollution* 47: 47 – 63.

Van Hassel, J.H., **R.J. Reash**, H.W. Brown, J.L. Thomas, and R.C. Mathews, Jr. 1988. Distribution of upper and middle Ohio River fishes, 1973 – 1985: I. Associations with water quality and ecological variables. *Journal of Freshwater Ecology* 4: 441 – 458.

Reash, R.J., and J.H. Van Hassel. 1988. Distribution of upper and middle Ohio River Ohio River fishes, 1973 – 1985: II. Influence of zoogeographic and physicochemical tolerance factors. *Journal of Freshwater Ecology* 4: 459 – 476.

Hamilton, S.J., and **R.J. Reash**. 1988. Bone development in creek chubs from a stream chronically polluted with heavy metals. *Transactions of the American Fisheries Society* 117: 48 – 54.

Reash, R.J., J.H. Van Hassel, and K.V. Wood. 1988. Ecology of a southern Ohio stream receiving fly ash pond discharge: changes from acid mine drainage conditions. *Archives of Environmental Contamination and Toxicology* 17: 543 – 554.

Reash, R.J., and T.M. Berra. 1987. Comparison of fish communities in a clean-water stream and an adjacent polluted stream. *American Midland Naturalist* 118: 301 – 322.

Reash, R.J., and T.M. Berra. 1986. Fecundity and trace-metal content of creek chubs from a metal-contaminated stream. *Transactions of the American Fisheries Society* 115: 346 – 351.

Technical Presentations:

Reash, R.J. “Safe to eat? Levels of mercury and selenium in fish collected near Ohio River coal-fired power plants”. Presented at the 2020 virtual American Fisheries Society Annual Meeting.

Linton, T.K., C. Delos, D. McIntyre, and **R.J. Reash**. “Applications of and developments in WET and ambient testing: evaluating method changes and advancements for toxicity testing”. Presented at the 2020 virtual Society of Environmental Toxicology and Chemistry Annual Meeting.

Reash, R.J. “Measuring Bioavailable Mercury in Process Wastewater and Ambient Water: Not all Mercury is the Same”. Presented at the 2016 Society of Environmental Toxicology and Chemistry Annual Meeting, Orlando, FL.

Bock, M.J., **R.J. Reash**, L.M., Friedrich, and N. Halderon. “Comparison of Fish Mercury and Selenium in Fish Otolith and Tissue: Can we Reconstruct the Past?”. Presented at the 2016 Society of Environmental Toxicology and Chemistry Annual Meeting, Orlando, FL.

Reash, R.J., and C.A. Svoboda. “Removal of Mercury and Other Trace Elements Through a Constructed Vertical Flow Wetland Receiving Flue Gas Desulfurization Leachate Wastewater”. Presented at 2013 Society of Environmental Toxicology and Chemistry Annual Meeting, Nashville, TN.

Friedrich, L., **R. Reash**, and V. Palace. “Using Otolith Microchemistry to Reconstruct Mercury Exposure Histories in Freshwater Drum Captured near Coal-fired Power Plants.” Presented at 2013 Society of Environmental Toxicology and Chemistry Annual Meeting, Nashville, TN.

Graham, A.M., **R.J. Reash**, A.C. Maizel, P. Chu, A. Wetterauer, A.L. Bullock, and C.C. Gilmour. “Mercury and Sulfur Chemistry in Leachate From a Wet Magnesium-Lime FGD Landfill”. Presented at 11th Annual International Conference on Mercury as a Global Pollutant, Glasgow, Scotland, 2013.

Reash, R.J. “A Multi-media Evaluation of Mercury Levels in Environmental Samples near a 2,600 MW Coal-Fired Power Plant in Southeastern Ohio, USA”. Presented at 10th Annual International Conference on Mercury as a Global Pollutant, Halifax, NS.

Reash, R.J., K. Merritt, and L. Brown. “Mercury, Selenium, and Arsenic Concentrations in Fish Collected near Coal-Fired Power Plants Along the Ohio River: Spatial Relationships and Fish Consumption Risk Considerations”. Presented at 10th Annual International Conference on Mercury as a Global Pollutant, Halifax, NS.

Reash, R.J. “Development of a Site-Specific Methylmercury Human Health Criterion in a Tributary of the Ohio River: Procedural and Technical Considerations”. Presented at 2010 Society of Environmental Toxicology and Chemistry Annual Meeting, Portland, OR.

Reash, R.J. “Elemental Associations Between Mercury and Selenium in Fish Collected from Fly Ash Exposure Sites and Reference Sites”. Presented at 2010 Society of Environmental Toxicology and Chemistry Annual Meeting, Portland, OR.

Reash, R.J. “The Bioaccumulation of Selenium from Coal Fly Ash: A Review”. Presented at 2009 Society of Environmental Toxicology and Chemistry Annual Meeting, New Orleans, LA.

Reash, R.J. “Cap and Trade Pollutant Reduction Programs: Concepts, Implementation, and Potential Applicability to Water Pollutants”. Presented at Water Environment Research Foundation 2008 Research Forum, Tampa, FL.

Reash, R.J. “Selenium, Mercury, and Arsenic in Fish Exposed to Selenium-Enriched Fly Ash Discharge: Seasonal Patterns, Elemental Associations, and Interspecific Differences Across Four Midwestern Sites”. Presented at 2008 Society of Environmental Toxicology and Chemistry Annual Meeting., Tampa, FL.

Reash, R.J., and K. Cummings. “Fish Community Metrics and Attributes at Selenium-Contaminated Sites: An Analysis Across Varying Exposure Settings”. Presented at 2008 Society of Environmental Toxicology and Chemistry Annual Meeting, Tampa, FL.

Reash, R.J. “Laboratory Versus Field Thermal Tolerances: A Review and Mechanisms Explaining Thermal Tolerance Plasticity.” Presented at 2007 EPRI Thermal Ecology and Regulation Workshop, Denver, CO.

Reash, R.J. “A Predictive Evaluation of Whole Effluent Toxicity Caused by Power Plant Flue Gas Desulfurization (FGD) Wastestreams.” Presented at 2007 Society of Toxicology and Chemistry Annual Meeting, Milwaukee, WI.

Reash, R.J. “Sources of Mercury, Selenium, and other Trace Metals in Wastewater at a Coal-fired Plant in Eastern Ohio.” Presented at 2007 Society of Toxicology and Chemistry Annual Meeting, Milwaukee, WI.

Reash, R.J. “The Bioaccumulation of Selenium Derived from Coal Ash: An Overview.” Presented at 2006 West Virginia Coal Association/AMD Task Force Symposium, Morgantown, WV.

Reash, R.J., R. E. Showman, M. Bock, and K. Lohman. “Mercury and Other Trace Metals in Lichen Samples Collected Near a Power Plant Cluster: Assessment of Near-Field Local Deposition.” Presented at 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 2006.

Reash, R.J. “Study Design Considerations in Monitoring Mercury Levels in Aquatic Biota: Distinguishing Real Trends from Normal Variability.” Presented at 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 2006.

Reash, R.J., J.G. Belviso, and R.E. Lockwood. “Elucidation of Chemical and Habitat Stressors in a Stream Recovering from Acid Mine Drainage.” Presented at 2004 Society of Environmental Toxicology and Chemistry Annual Meeting, Portland, OR.

Reash, R.J., and R.E. Showman. “Mercury and Other Trace Metals in Lichen Samples Collected Near a Coal-fired Power Plants.” Presented at 2004 Society of Environmental Toxicology and Chemistry Annual Meeting, Portland, OR

Reash, R.J., R.E. Lockwood, and J.G. Belviso. “Toxicity Identification Evaluation of a Coal Ash Effluent: Assessment of Watershed Mine Drainage Influence.” Presented at 2003 Society of Environmental Toxicology and Chemistry Annual Meeting, Austin, TX.

Reash, R.J. “Industrial Perspective on Permit Development”. Presented at 2002 Society of Environmental Toxicology and Chemistry Whole Effluent Toxicity Testing Workshop, Indianapolis, IN.

Reash, R. “An Evaluation of EPA’s Bioaccumulation Factor (BAF) for Mercury: A Regulated Industry Perspective”. Presented at 2001 U.S. EPA/USGS Workshop on the Fate, Transport, and Transformation of Mercury in Aquatic and Terrestrial Environments, West Palm Beach, FL.

Reash, R.J. “TMDLs for Mercury: The Need for Scientifically-Defensible Database Modeling and Development Requirements.” Presented at 2001 Society of Environmental Toxicology and Chemistry Annual Meeting, Baltimore, MD.

Lohner, T.W., and **R.J. Reash**. “Selenium Tissue Residues in Tolerant Sunfish Populations: Issues of Bioavailability and Toxicity.” Presented at 2001 Society of Environmental Toxicology and Chemistry Annual Meeting, Baltimore, MD.

Reash, R.J., and G.L. Seegert, “Effects of Low Flow, High Temperature Conditions on Fish Communities in a Large Midwestern River.” Presented at 2000 Society of Environmental Toxicology and Chemistry Annual Meeting, Knoxville, TN.

Lohner, T.W., **R.J. Reash**, K.V. Wood, V.E. Willet, and M.V. Williams, “Assessment of Tolerant Sunfish Populations Inhabiting Coal Ash Effluents: Biochemical Versus Population-Level Effects.” Presented at 2000 Society of Environmental Toxicology and Chemistry Annual Meeting, Knoxville, TN.

Reash, R.J. “A Critical Evaluation of Water Quality Criteria for the Protection of Piscivorous Wildlife.” Presented at 40th Ohio Fish and Wildlife Conference, Columbus, OH, 2000.