Christopher L. Rowe

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Education:

1991-1994: Ph. D., Biology, The Pennsylvania State University, University Park, PA. (Advisor: William A. Dunson).

1990: Graduate courses in Oceanography. Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA.

1985-1989: B.S., Biology, Marine Science minor, The Pennsylvania State University, University Park, PA.

Post-graduate Experience:

1999 to present: Assistant/Associate Professor, University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory (CBL), Solomons, MD.

1999 to present: Graduate Faculty, University of Maryland School of Medicine, Department of Epidemiology and Preventative Medicine, Program in Toxicology, Baltimore, MD.

1997 to 1999: Assistant Professor, Universidad de Puerto Rico Recinto Rio Piedras, Departmento de Biología, San Juan, PR.

1995 to 1997: Post-doctoral Researcher, University of Georgia, Savannah River Ecology Laboratory, Aiken, SC. (Advisor: Justin D. Congdon).

1994 to 1995: Visiting Assistant Professor, Georgia Southern University, Department of Biology, Statesboro, GA.

Primary Research Interests:

- Physiological ecology and ecotoxicology of ectothermic vertebrates.
- Ecotoxicological effects of fossil fuel processing and waste disposal.
- Energetics of ectotherms.
- Influences of contaminants on physiology and ecology of aquatic animals.
- Thermal ecology.
- Biology and ecology of the diamondback terrapin.

Courses Taught:

Physiological Ecology of Animals (3 credits, CBL, graduate-level), 6 semesters.
Ecological Foundations (3 credits, CBL, graduate-level, team-taught), 1 semester.
Bioenergetics and Population Dynamics (3 credits, CBL, graduate-level; co-taught), 5 semesters.
Seminar in Environmental Forensics (2 credits, CBL, graduate-level; team taught), 1 semester
Seminar in Aquatic Ecotoxicology (1 credit, CBL, graduate-level; team taught), 3 semesters.
Seminar in Evolutionary Biology and Ecological Stress (1 credit, CBL, graduate-level), 1 semester.
Ecotoxicology and Stress Ecology (1 credit, U. Puerto Rico, graduate-level), 1 semester.
Biometry (4 credits, U. Puerto Rico, graduate-level; co-taught), 1 semester
Zoology (3 credits, U. Puerto Rico), 4 semesters.
Zoology Laboratory (1 credit, U. Puerto Rico and Georgia Southern U.), 3 semesters.
Introductory Biology II, non-majors (3 credits, Georgia Southern U.), 2 semesters.
Human Anatomy & Physiology II Laboratory (2 credits, Georgia Southern U.), 1 semester.

Manuscript Referee:

Peer reviewer for: *American Midland Naturalist; Amphibia-Reptilia; Analyst; Applied Herpetology; Aquatic Ecology; Aquatic Toxicology; Archives of Environmental Contamination and Toxicology; Bioscience; Canadian Journal of Zoology; Chelonian Conservation and Biology; Chemosphere; Comparative Biochemistry and Physiology; Conservation Biology; Copeia; Ecology; Ecosphere; Ecotoxicology; Ecotoxicology and Environmental Safety; Environmental Health Perspectives; Environmental Management; Environmental Pollution; Environmental Research; Environmental Science and Technology; Environmental Toxicology and Chemistry; Estuaries; Evolution; Functional Ecology; Herpetologica; International Journal of Environmental Research and Public Health; International Journal of Molecular Sciences; International Journal of Marine Science; Journal of Animal Ecology; Journal of Applied Ecology; Journal of Experimental Zoology; Journal of Experimental Marine Biology and Ecology; Journal of Herpetology; Journal of Marine Systems; Marine Ecology Progress Series; Oecologia; Physiological and Biochemical Zoology; PLoS ONE; Science of the Total Environment; The Scientific World; Wetlands*.

Other Editorial Activities:

Editorial Board, Environmental Toxicology and Chemistry (2008 - 2011)
Script reviewer for syndicated radio broadcast "Our Ocean World." Responsible for reviewing approximately 50 scripts (2007 - 2008).
Reviewer of numerous research proposals to federal, state, and international agencies and NGOs.

Memberships in Professional Societies:

Society of Environmental Toxicology and Chemistry
Chesapeake/Potomac Regional Chapter of Society of Environmental Toxicology and Chemistry
Society for the Study of Amphibians and Reptiles
Diamondback Terrapin Working Group
Atlantic Estuarine Research Society

Publications –

1. Peer Reviewed Journal Articles:

La Rosa, GA, Woodland RJ, Rowe CL. 2020. Carbon:nitrogen ratios as a proxy for tissue nonpolar lipid content and condition in black sea bass *Centropristis striata* along the Middle Atlantic Bight. *Marine Biology*, in press.

Rowe CL, Liang D, Woodland RJ. 2020. Effects of constant and fluctuating incubation temperatures on hatching success and hatchling traits in the diamondback terrapin (*Malaclemys terrapin*) in the context of the warming climate. *Journal of Thermal Biology* 88: 102528.

Glandon, H.L., Paynter, K.T., Rowe, C.L., Miller, T.J., 2019. Resilience of oxygen consumption rates in the juvenile blue crab *Callinectes sapidus* to future predicted increases in environmental temperature and pCO_2 in the mesohaline Chesapeake Bay. *Journal of Shellfish Research* 38:711-723.

Rowe CL. 2018. Standard metabolic rates of early life stages of the diamondback terrapin (*Malaclemys terrapin*), an estuarine turtle, suggest correlates between life history changes and the metabolic economy of hatchlings. *Zoology* 127:20-26.

Rowe CL. 2018. Maximum standard metabolic rate corresponds with the salinity of maximum growth in hatchlings of the estuarine northern diamondback terrapin (*Malaclemys terrapin terrapin*): Implications for habitat conservation. *Acta Oecologica* 86:79-83.

Rowe CL, Crandall EA. 2018. The acute thermal respiratory response is unique among species in a guild of larval anuran amphibians - Implications for energy economy in a warmer future. *Science of the Total Environment* 618:229–235.

Nagle RD, Rowe CL, Grant CJ, Sebastian ER, Martin BE. 2018. Abnormal shell shapes in northern map turtles of the Juniata River, Pennsylvania, USA. *Journal of Herpetology* 52:59-66.

Rowe CL, Heyes A. 2017. Dietary accumulation of inorganic selenium by a larval amphibian (*Hyla chrysoscelis*) and influence on accumulation of background mercury. *Bulletin of Environmental Contamination and Toxicology* 99:182-186.

Rowe CL, Funck SA. 2017. Respiration rates of larval Cope's gray tree frogs (*Hyla chrysoscelis*) across a range in temperatures. *Journal of Herpetology* 51:130-133.

Rowe CL, Woodland RJ, Funck SA. 2017. Metabolic rates are elevated and influenced by maternal identity during the early, yolk-dependent, post-hatching period in an estuarine turtle, the

diamondback terrapin (*Malaclemys terrapin*). *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology* 204:137-145.

Woodland RJ, Rowe CL, Henry PFP. 2017. Changes in habitat availability for multiple life-stages of diamondback terrapins (*Malaclemys terrapin*) in response to sea level rise. *Estuaries and Coasts* 40:1502-1515.

Eisenreich, KA, Rowe CL. 2014. Dietary exposure of BDE-47 and BDE-99 and effects on behavior, bioenergetics, and thyroid function in juvenile red-eared sliders (*Trachemys scripta elegans*) and common snapping turtles (*Chelydra serpentina*). *Environmental Toxicology and Chemistry* 33:2810-2817.

Rowe, CL. 2014. Bioaccumulation and effects of metals and trace elements from aquatic disposal of coal combustion residues: recent advances and recommendations for further study. *Science of the Total Environment* 485:490-496.

Salice CJ, Rowe CL, Eisenreich KM. 2014. Integrative demographic modeling reveals population level impacts of PCB toxicity to juvenile snapping turtles. *Environmental Pollution* 184:154-160.

Heyes A, Rowe CL, Conrad P. 2014. Differential patterns of accumulation and retention of dietary trace elements associated with coal ash during larval development and metamorphosis of an amphibian. *Archives of Environmental Contamination and Toxicology* 66:78-85.

Stefansson ES, Heyes A, Rowe CL. 2014. Tracing maternal transfer of methylmercury in the sheepshead minnow (*Cyprinodon variegatus*) with an enriched mercury stable isotope. *Environmental Science and Technology* 48:1957-1963.

Lockard LL, Rowe CL, Heyes A. 2013. Dietary selenomethionine exposure induces physical malformations and reduces growth and survival to metamorphosis in an amphibian (*Hyla chrysoscelis*). *Archives of Environmental Contamination and Toxicology* 64:504-513.

Eisenreich KM, Rowe CL. 2013**.** Experimental exposure of eggs to polybrominated diphenyl ethers BDE-47 and BDE-99 in red-eared sliders (*Trachemys scripta elegans*) and snapping turtles (*Chelydra serpentina*) and possible species-specific differences in debromination. *Environmental Toxicology and Chemistry* 32:393-400.

Stefansson ES, Heyes A, Rowe CL. 2013. Accumulation of dietary methylmercury and effects on growth and survival in two estuarine forage fish: *Cyprinodon variegatus* and *Menidia beryllina*. *Environmental Toxicology and Chemistry* 32:848-856.

Yost DM, Mitchelmore CL, Rowe CL, Jones R. 2012. Quantification of total and particulate dimethylsulfoniopropionate (DMSP) in five Bermudian coral species across a depth gradient. *Coral Reefs* 31:561-570.

Eisenreich KM, Dean KM, Ottinger MA, Rowe CL. 2012. Comparative effects of *in ovo* exposure to sodium perchlorate on development, growth, metabolism, and thyroid function in the common snapping turtle (*Chelydra serpentina*) and red-eared slider (*Trachemys scripta elegans*). *Comparative Biochemistry and Physiology C* 56:166-170.

Rowe CL, Heyes A, Hilton J. 2011. Differential patterns of accumulation and depuration of dietary selenium and vanadium during metamorphosis of the gray tree frog (*Hyla versicolor*). *Archives of Environmental Contamination and Toxicology* 60:336-342.

Salice CJ, Rowe CL, Pechmann JHK, Hopkins WA. 2011. Multiple stressors and complex life cycles: insights from a population-level assessment of breeding site contamination and terrestrial habitat loss in an amphibian. *Environmental Toxicology and Chemistry* 30:2874-2882.

Manyin T, Rowe CL. 2010. Reproductive and life stage-specific effects of aqueous copper on the grass shrimp, *Palaemonetes pugio*. *Marine Environmental Research*. 69:152-157.

Rowe CL, Mitchelmore CL, Baker JE. 2009. Lack of biological effects of water accommodated fractions of chemically- and physically-dispersed oil on molecular, physiological, and behavioral traits of juvenile snapping turtles following embryonic exposure. *Science of the Total Environment* 407:5344-5355.

Manyin T, Rowe CL. 2009. Bioenergetic effects of aqueous copper and cadmium on the grass shrimp, *Palaemonetes pugio*. *Comparative Biochemistry and Physiology C* 150:65-71.

Eisenreich KA, Kelly SM, Rowe CL. 2009. Latent mortality of juvenile snapping turtles from the Upper Hudson River, New York, USA exposed maternally and via the diet to polychlorinated biphenyls (PCBs). *Environmental Science and Technology*. 43:6052-6057.

Rowe CL, Heyes A, Hopkins WA. 2009. Effects of dietary vanadium on growth and lipid storage in a larval anuran: results from studies employing *ad libitum* and rationed feeding. *Aquatic Toxicology* 91:179-186.

Rowe CL. 2008. "The calamity of so long life:" Life histories, contaminants, and potential emerging threats to long-lived vertebrates. *Bioscience* 58:623-631.

Manyin T, Rowe CL. 2008. Modeling effects of cadmium on population growth of *Palaemonetes pugio*: results of a full life cycle exposure. *Aquatic Toxicology* 88:111-120.

Kelly SM, Eisenreich KA, Baker JE, Rowe CL. 2008. Accumulation and maternal transfer of Polychlorinated Biphenyls (PCBs) in snapping turtles of the upper Hudson River, New York, USA. *Environmental Toxicology and Chemistry*. 27:2565-2574.

Kuzmick D, Mitchelmore CL, Hopkins WA, Rowe CL. 2007. Effects of coal combustion residues on survival, antioxidant potential and genotoxicity resulting from full-lifecycle exposure of grass shrimp (*Palaemonetes pugio* Holthius). *Science of the Total Environment*. 373:420-430.

Manyin T, Rowe CL. 2006. Chronic exposure of *Leptocheirus plumulosus* to Baltimore Harbor sediment: bioenergetic and population level effects. *Marine Environmental Research*. 62:116-130.

Hopkins WA, DuRant SE, Staub BP, Rowe CL, Jackson BP. 2006. Reproduction, embryonic development, and maternal transfer of trace elements in the amphibian *Gastrophryne carolinensis*. *Environmental Health Perspectives*. 114:661-666.

Rowe CL, Kelly SM. 2005. Marking hatchling turtles via intraperitoneal placement of PIT tags: implications for long-term studies. *Herpetological Review*. 36:408-410.

Roe JH, Hopkins WA, Baionno JA, Staub BP, Rowe CL, Jackson BP. 2004. Maternal transfer of selenium in *Alligator mississippiensis* nesting downstream from a coal burning power plant. *Environmental Toxicology and Chemistry*, 23:1969-1972.

Rowe CL. 2003. Growth responses of an estuarine fish exposed to mixed trace elements in sediments over a full life cycle. *Ecotoxicology and Environmental Safety*. 54:229-239.

Rowe CL. 2002. Differences in maintenance energy expenditures by two estuarine shrimp (*Palaemonetes pugio* and *P. vulgaris*) that may permit partitioning of habitats by salinity. *Comparative Biochemistry and Physiology* 132A:341-351.

Rowe CL, Hopkins WA, Congdon JD. 2002. Ecotoxicological implications of aquatic disposal of coal combustion residues in the United States: a review. *Environmental Monitoring and Assessment* 80:207-276.

Rowe CL, Hopkins WA, Congdon JD. 2001. Integrating individual-based indices of contaminant effects: how multiple sublethal effects may ultimately reduce amphibian recruitment from a contaminated breeding site. *The Scientific World* 1:703-712.

Rowe CL, Hopkins WA, Coffman V. 2001. Failed recruitment of southern toads (*Bufo terrestris*) in a trace element-contaminated breeding habitat: direct and indirect effects that may lead to a local population sink. *Archives of Environmental Contamination and Toxicology* 40:399-405.

Rowe CL, Hopkins WA, Zehnder C, Congdon JD. 2001. Metabolic costs incurred by crayfish (*Procambarus acutus*) in a trace element-polluted habitat: further evidence of a common response among diverse taxonomic groups. *Comparative Biochemistry and Physiology* 129C:275-283.

Nagle RD, Rowe CL, Congdon JD. 2001. Accumulation and selective maternal transfer of contaminants in the turtle *Trachemys scripta* associated with coal ash deposition. *Archives of Environmental Contamination and Toxicology* 40:531-536.

Congdon JD, Dunham AE, Hopkins WA, Rowe CL, Hinton TG. 2001. Resource allocation based life history trait values: a conceptual basis for studies of environmental toxicology. *Environmental Toxicology and Chemistry* 20:1698-1703.

Hopkins WA, Roe JH, Snodgrass JW, Jackson BP, Kling DE, Rowe CL, Congdon JD. 2001. Nondestructive indices of trace element exposure in squamate reptiles. *Environmental Pollution* 115:1-7.

Hopkins WA, Rowe CL, Congdon JD. 1999. Elevated trace element concentrations and standard metabolic rate in banded water snakes, *Nerodia fasciata*, exposed to coal combustion wastes. *Environmental Toxicology and Chemistry,* 18:1258-1263.

Rowe CL. 1998. Elevated standard metabolic rate in a freshwater shrimp (*Palaemonetes paludosus*) exposed to trace element-rich coal combustion waste. *Comparative Biochemistry and Physiology A* 121:299-304.

Rowe CL, Kinney OM, Congdon JD. 1998. Oral deformities in tadpoles of the bullfrog (*Rana catesbeiana*) caused by conditions in a polluted habitat. *Copeia* 1998:244-246.

Rowe CL, Kinney OM, Nagle RD, Congdon JD. 1998. Elevated maintenance costs in an anuran (*Rana catesbeiana*) exposed to a mixture of trace elements during the embryonic and early larval periods. *Physiological Zoology* 71:27-35.

Raimondo SM, Rowe CL, Congdon JD. 1998. Exposure to coal ash impacts swimming behavior and predator avoidance in larval bullfrogs (*Rana catesbeiana*). *Journal of Herpetology* 32:289-292.

Hopkins WA, Mendonça M, Rowe CL, Congdon JD. 1998. Elevated trace element concentrations

in southern toads (*Bufo terrestris*) exposed to coal combustion wastes. *Archives of Environmental Contamination and Toxicology* 35:325-329.

Rowe CL, Kinney OM, Fiori AP, Congdon JD. 1996. Oral deformities in tadpoles (*Rana catesbeiana*) associated with coal ash deposition: effects on grazing ability and growth. *Freshwater Biology* 37:723-730.

Dunson WA, Rowe CL. 1996. The effects of species manipulation on growth and survival of an assemblage of juvenile estuarine fish. *Journal of Fish Biology* 48:120-130.

Rowe CL, Dunson WA. 1995. Impacts of pond hydroperiod on growth and survival of larval amphibians in temporary ponds of central Pennsylvania, U.S.A. *Oecologia* 102:397-403.

Rowe CL, Dunson WA. 1995. Individual and interactive effects of salinity and initial fish density on a salt marsh assemblage. *Marine Ecology Progress Series* 128:271-278.

Rowe CL, Dunson WA. 1994. The value of simulated pond communities in mesocosms for studies of amphibian ecology and ecotoxicology. *Journal of Herpetology* 28:346-356.

Rowe CL, Sadinski WJ, Dunson WA. 1994. Predation on larval and embryonic amphibians by acid-tolerant caddisfly larvae (*Ptilostomis postica*). *Journal of Herpetology* 28:357-363.

Rowe CL, Dunson WA. 1993. Relationships among abiotic parameters and breeding effort by three amphibians in temporary wetlands of central Pennsylvania. *Wetlands* 13:237-246.

Ruth BC, Dunson WA, Rowe CL, Hedges SB. 1993. A molecular and functional evaluation of the egg mass color polymorphism of the spotted salamander, *Ambystoma maculatum*. *Journal of Herpetology* 27:306-314.

Rowe CL, Sadinski WJ, Dunson WA. 1992. Effects of acute and chronic acidification on three larval amphibians that breed in temporary ponds. *Archives of Environmental Contamination and Toxicology* 23:339-350.

2. Peer Reviewed Book Chapters:

Hopkins WA, Rowe CL. 2010. Interdisciplinary and hierarchical approaches for studying the effects of metals and metalloids on amphibians. In Linder G, Sparling D, Krest, S (eds). *Ecotoxicology of Amphibians and Reptiles, 2nd edition*. SETAC Press, Boca Raton.

Linder G, Palmer BD, Little EE, Rowe CL, Henry PFP. 2010. Physiological ecology of amphibians and reptiles: natural history and life history attributes framing chemical exposure in the field. In Linder G, Sparling D, Krest, S (eds). *Ecotoxicology of Amphibians and Reptiles, 2nd edition*. SETAC Press, Boca Raton.

Mitchelmore CL, Rowe CL, Place AR. 2005. Tools for assessing contaminant exposure and effects in reptiles. In: Gardner, S. and E. Oberdorster, (eds). *Toxicology of Reptiles*. CRC Press.

Rowe CL, Hopkins WA. 2003. Anthropogenic activities producing sink habitats for amphibians in the local landscape: a case-study of lethal and sublethal effects of coal combustion residues in the aquatic environment. In: Linder, G., S. Crest, and D. W. Sparling, (eds). *Amphibian Decline: An Integrated Analysis of Multiple Stressor Effects.* SETAC Press.

Rowe CL, Hopkins WA, Bridges C. 2003. Physiological ecology of amphibians in relation to susceptibility to natural and anthropogenic factors. In: Linder, G., S. Crest, and D.W.

Sparling (eds). *Amphibian Decline: An Integrated Analysis of Multiple Stressor Effects.* SETAC Press.

Bridges C, Rowe CL, Hopkins WA. 2003. Conservation genetics of amphibians. In: Linder, G., S. Crest, and D.W. Sparling. (eds). *Amphibian Decline: An Integrated Analysis of Multiple Stressor Effects.* SETAC Press.

Rowe CL, Freda J. 2000. Effects of acidification on amphibians at multiple levels of biological organization. In: Sparling, D.W., G. Linder, and C. Bishop (eds), *Ecotoxicology of Amphibians and Reptiles*. SETAC Press.