

CURRICULUM VITAE

Darren Rumbold

Personal Data

Born: 10 October 1959
Family Status: Married; one son

Citizenship: USA

Present Title & Address

Associate Professor of Marine Science
Florida Gulf Coast University
10501 FGCU Blvd. South
Ft Myers, Florida 33965

Work Phone: 239.590.7527
FAX: 239.590.7200
e-mail: drumbold@fgcu.edu

Education

- 1997** Post-doctoral Fellowship. U.S. EPA Environmental Science & Engineering Fellow. National Center for Environmental Assessment, Washington, DC
- 1996** Ph.D. in Marine Biology and Fisheries, Rosenstiel School of Marine and Atmospheric Science, University of Miami, FL
- 1992** Summer course in marine pollution, Bermuda Biological Station for Research, Bermuda
- 1990** M.S. in Biology. Florida Atlantic University, Department of Biological Science, Boca Raton, FL.
- 1982** B.S. Biology, Florida Atlantic University, Department of Biological Science, Boca Raton, FL
- 1982** B.A. Chemistry, Florida Atlantic University, Department of Chemistry, Boca Raton, FL
- 1979** A.A., Edison Community College, Ft. Myers, FL

Professional Experience

- 2006-present** Associate Professor of Marine Science, Depart. of Marine and Ecological Sciences, FGCU. Current research: Landscape ecotoxicology and risk assessment; teaching: Marine Systems, Oceanography, Environmental Toxicology, Ecotoxicology, and a Special Topics Course in Ecological Risk Assessment
- 2004-2006** Lead Environmental Scientist, South Florida Water Management District. Program coordinator for all mercury monitoring and research within the District; interagency team leader for mercury monitoring and research under the Comprehensive Everglades Restoration Plan (CERP). Ft. Myers, FL.
- 1998-2004** Senior Environmental Scientist, SFWMD. Responsible for data analyses and report writing for mercury monitoring program pursuant to numerous state and federal permits; Water Quality Team leader for the Southwest Florida Feasibility Study assessing and formulating alternatives for improving water quality. West Palm Beach and Ft. Myers, FL.
- 1991-1995** Graduate Research Assistant, University of Miami. Conducted research on organochlorine pesticide and polyaromatic hydrocarbon contamination in the Florida Keys' coral-reef system. RSMAS, Miami, FL.

- 1986-1991** Staff Biologist, Solid Waste Authority Palm Beach County. Directed long-term monitoring of a large mixed-species, waterbird colony for possible impacts from construction and operation of a solid-waste incinerator and landfill. West Palm Beach, FL.
- 1986** Chemical plant worker, Jones Chemicals, Inc. Assisted in the repackaging of chlorine gas (i.e., from tanker cars to 1-ton and 150-lb cylinders) and in the manufacture of sodium hypochlorite bleach. Ft. Lauderdale, FL.

Recent Grants, Contracts and Honorariums

- 2008** Served on Independent Technical Review Team for Chesapeake Research Consortium to assess risk associated with various beneficial uses of contaminated sediments dredged from Baltimore Harbor, MD.
- 2008** Professional services contract with South Florida Water Management District to provide technical support on the Caloosahatchee River Watershed Protection Plan. (\$21K)
- 2007-2008** Professional services contract with Camp, Dresser & McKee, Inc. to carry out a retrospective environmental impact assessment of a municipal solid-waste landfill. (\$30K)
- 2007-2008** Professional services contract with South Florida Water Management District to provide technical support on water quality issues related to the Southwest Florida Feasibility Study. (\$22K)
- 2006-2008** Professional services contract with South Florida Water Management District to provide technical support regarding mercury-sulfur cycling, fate, transport and effects in the Everglades. (Parts I & II: \$40.5K)
- 2002** Invited breakout-group lead for 2-day workshop developing the mercury science strategy for CALFED Bay-Delta System, Monterey, CA
- 2000-2002** Co-Principal Investigator on project titled “Linking Everglades Restoration and Enhanced Freshwater Flows to Elevated Concentrations of Mercury in Florida Bay Fish.” National Ocean Service, National Oceanic and Atmospheric Administration. (\$338K)
- 1999-2000** PI on project titled “Contaminants in wildlife inhabiting the area around Palm Beach County’s North County Resource Recovery Facility.” Solid Waste Authority of Palm Beach County. (\$48K)

Professional and Community Service

- 2008** Invited participant – Gulf of Mexico Alliance Mercury Workshop, Gulfport, MS
- 2008** Appointed by FGCU Provost to serve as Campus Coordinator for Florida Sea Grant
- 2008** Invited participant – National Mercury Monitoring Workshop (US EPA), Annapolis, MD
- 2008** Served on the program committee-Society of Environmental Toxicology and Chemistry 2008 Annual Meeting
- 2008** Invited participant – Mercury-Sulfur Workshop (FL Dept. Environmental Protection), Homestead, FL
- 2006-2009** Served as FGCU Marine Science Program Lead
- 2006-2009** Served on FGCU’s Institutional Animal Care and Use Committee
- 2006-2008** Served on City of Bonita Springs’ Tree Advisory Committee

- 2007** Proposal reviewer for National Science Foundation
- 2006-2009** Editorial Board: Environmental Bioindicators Journal
- 1996-2009** Peer-reviewer for the following journals: Archives of Environ. Contam. and Toxic., Biological Conservation, Ecotoxicology, Environ. Res., Environ. Monit. Assess, Environ. Sci. Tech., Environ. Pollut., J. of Mar. Environ. Res., Sci. of the Total Environ.
- 2006** Member Expert Panel: Mercury Bioindicators; 14th International Conference on Environmental Bioindicators
- 2005** Co-Chair of symposium titled “Florida Ecosystem: Case Studies and Relevance for Risk Analyses”; 2005 Annual Meeting of the Society for Risk Analysis
- 2000-2004** Served on selection committee, Amer. Assoc. Advancement Sci. - Science and Technology Policy Fellowship Programs
- 2001** Committee member, EcoRisk Focus Group, Florida Contaminated Soils Forum
- 1999** Co-organizer of workshop on “Effects Assessment for Mercury in Fish-eating Birds: Setting an Avian Wildlife Criterion”

Peer-Reviewed Journal Publications

- In prep** Engel, M, Axelrad, D. and Rumbold, D. Increasing the Transparency of the National Fish Consumption Advisory for Mercury: A Case Study Based on the Orange Roughy.
- In prep** Rumbold, D.G., Evans, D., Niemczyk, S., Fink, L., Laine, K., Niemeyer, N., Krabbenhoft, and Zucker M. Source identification of Florida Bay's methylmercury problem: mainland runoff versus atmospheric deposition and in situ production. Submitted for internal USGS review.
- In press** Rumbold, D.G., Mihalik, M.B., and Bruner, M.C. Assessing the Ecological Risk of a Municipal Solid Waste Landfill to Surrounding Wildlife: a Case Study in Florida. *Environmental Bioindicators*.
- 2009** Herring, G., Gawlik, D.E., and Rumbold, D.G. Physiological responses to methylmercury in Great Egret and White Ibis chicks in the Florida Everglades. *Sci. of the Total Environ.*, 407: 2641-2649
- 2008** Rumbold, D.G., Lange, T.R., Axelrad, D.M., Atkeson, T.D. Ecological risk of methylmercury in Everglades National Park, Florida, U.S.A. *Ecotoxicology* 17:632-641
- 2007** Henshel, D., Aschner, M., Basu, N., Bowerman, W., Echeverria, D., Gilbertson, M., Ralston, N., Rumbold, D., Wolfe, M. Roundtable Discussion Groups Summary Papers: New Bioindicators for Mercury Toxicological Assessment: Recommendations from the First International Bioindicators Roundtable. *Environ. Bioindicators*, 2:183 – 207.
- 2006** Rumbold D.G., and Fink, L.E. Extreme spatial variability and unprecedented methylmercury concentrations within a constructed wetland. *Environ. Monit. Assess.*, 112: 115–135
- 2005** Rumbold D.G. A probabilistic risk assessment of the effects of methylmercury on Great Egrets and Bald Eagles foraging at a constructed wetland in South Florida relative to the Everglades. *Human and Ecol. Risk Assess.*, 11(2): 365-388.
- 2002** Rumbold D.G., Fink, L.E., Laine, K.A., Niemczyk, S.L., Chandrasekhar, T., Wankel, S.D. and Kendall, C. Levels of mercury in alligators (*Alligator Mississippiensis*) collected along a transect through the Florida Everglades. *Sci. of the Total Environ.*, 297: 239-252.

- 2002** Rumbold, D.G., and Mihalik, M.B.. Biomonitoring environmental contaminants near a municipal solid-waste combustor: a decade later. *Environ. Pollution*.117: 15-21.
- 2001** Rumbold D.G., Niemczyk, S.L., Fink, L.E., Chandrasekhar, T., Harkanson, B., and Laine K.A. Mercury in eggs and feathers of Great Egrets (*Ardea albus*) from the Florida Everglades. *Arch. Environ. Contam. Tox.* 41: 501-507.
- 2001** Rumbold, D.G., Davis, P.W., and Peretta. C. Estimating the effect of beach nourishment on *Caretta caretta* (Loggerhead sea turtle) nesting. *Restoration Ecology*, 9: 304 – 310.
- 1999** Rumbold, D.G., and Snedaker, S.C. Sea-surface microlayer toxicity off the Florida Keys. *Mar. Environ. Res.*,47: 457-472.
- 1997** Rumbold, D.G., Bruner, M.C., Mihalik, M.B., and Marti, E.A. Biomonitoring environmental contaminants near a municipal solid-waste combustor. *Environ. Pollut.*, 96: 99-105.
- 1997** Rumbold, D.G., and Snedaker, S.C. Evaluations of bioassays to monitor surface microlayer toxicity in tropical waters. *Arch. Environ. Contam. Tox.*, 32: 135-140.
- 1996** Rumbold, D.G., Mihalik, M.B., Bruner, M.C., Marti, E.A., and White, L.L. Organochlorine pesticides in aningas, white ibises and apple snails collected in Florida: 1989 - 1991. *Arch. Environ. Contam. Tox.*, 30: 379-383.
- 1995** Glynn, P.W., Rumbold, D.G., and Snedaker, S.C. Organochlorine pesticide residues in marine sediment and biota from the northern Florida reef tract. *Mar. Pollut. Bull.*, 30:397-407.
- 1995** Snedaker, S.C., Glynn, P.W., Rumbold, D.G. and Corcoran, E.F. Distribution of n-alkanes in marine samples from southeast Florida. *Mar. Pollut. Bull.*, 30:83-89.
- 1994** Rumbold, D.G., and Mihalik, M.B. Snail Kite use of a communal roost and drought-related habitat, 1987-1991. *Fl. Field Naturalist*, 22:29-38.
- 1994** Rumbold, D.G., and Snedaker, S.C. Do mangroves float? *J. Tropical Ecol.*, 10:281-284.

Book Chapters and Select Technical Reports

- In review** Rumbold, D.G., and Evans, D. Mercury contamination: a global issue with local impacts. *In* Kruczynski, W. and Fletcher, P. (eds.). South Florida Marine Environments: An Ecological Synthesis. NOAA/USEPA
- 2009** Independent Technical Review Team. Sediment in Baltimore Harbor: Quality and Suitability for Innovative Reuse. An Independent Technical Review. Jonathan Kramer, Jessica Smits, and Kevin Sellner (eds.) Maryland Sea Grant Publication UM-SG-TS-2009-04. CRC Publ. No. 09-169.
- 2008** Gabriel, M., Redfield, G. and Rumbold, D. Appendix 3B-2: Sulfur as a Regional Water Quality Concern. *In* 2008 South Florida Environmental Report Vol 1. South Florida Water Management District, West Palm Beach, FL. https://my.sfwmd.gov/pls/portal/docs/PAGE/PG_GRP_SFWMDSFER/PORTLET_SUBTAB_DRAFT_RPT/TAB19853153/APPENDICES2008/v1_app_3b-2.pdf
- 2007** Rumbold, D., Niemeyer, N., Matson, F., Atkins, S., Jean-Jacques, J., Nicholas, K., Owens, C., Strayer, K., and Warner, B. Appendix 3B-1: Annual permit compliance monitoring report for mercury in downstream receiving waters of the Everglades Protection Area. *In* 2007 South Florida Environmental Report Vol 1. South Florida Water Management District, West Palm Beach, FL. http://www.sfwmd.gov/sfer/SFER_2007/

- 2007** Rumbold, D., Niemeyer, N., Matson, F., Atkins, S., Jean-Jacques, J., Nicholas, K., Owens, C., Strayer, K., and Warner, B. Appendix 5-6: Annual permit compliance monitoring report for mercury in Stormwater Treatment Areas. *In* 2007 South Florida Environmental Report. Vol 1. South Florida Water Management District, West Palm Beach, FL. http://www.sfwmd.gov/sfer/SFER_2007/
- 2007** Axelrad, D.M., Atkeson, T.D., Lange, T., Pollman, C.D., Gilmour, C.C., Orem, W.H., Mendelsohn, I.A., Frederick, P.C., Krabbenhoft, D.P., Aiken, G.R., Rumbold, D.G., Scheidt, D.J., Kalla, P.I. Chapter 3B: Mercury Monitoring, Research and Environmental Assessment in South Florida. *In* 2007 South Florida Environmental Report. Vol 1. South Florida Water Management District, West Palm Beach, FL. <http://www.sfwmd.gov/sfer/>. March 2007.
- 2006** Rumbold, D.G. Appendix 4-7: Updated Ecological Risk Assessment of Mercury at STA-2: Bald Eagle, Wood Stork and Snail Kite. *In* 2006 South Florida Environmental Report Vol 1. South Florida Water Management District, West Palm Beach, FL. <http://www.sfwmd.gov/sfer/>
- 2005** Rumbold, D.G., and Pfeuffer, R.. District guidance in the design of a project-level monitoring and assessment plan for mercury and other toxicants. Appendix: Comprehensive Everglades Restoration Plan Guidance Memorandum 42.00. http://www.evergladesplan.org/pm/program_docs/ cerp-guidance-memo.cfm
- 2004** Barnes, T., Rumbold, D., and Salvato, M. Caloosahatchee Estuary and Charlotte Harbor Conceptual Model. Southwest Florida Feasibility Study. www.evergladesplan.org/pm/studies/studydocs/ swfl/swffs_cems_caloosahatchee_b.pdf
- 2004** Thomas, D. and Rumbold, D.G. Coastal Bays and Barrier Islands: Ecological Conceptual Model. Southwest Florida Feasibility Study. http://www.evergladesplan.org/pm/studies /study_docs/swfl/swffs_cems_coastalbays6.pdf
- 2003** Rumbold, D., Evans, D., Niemczyk, S., Crumley, P., Fink, L., Laine, K., Niemeyer, N., and Drummond, A. Preliminary Report on Florida Bay Mercury Screening Study (Monitoring the Effect of Restoration and Enhanced Freshwater Flows on Biogeochemistry and Bioaccumulation of Mercury in Florida Bay). Appendix 2B-4 *In* 2003 Everglades Consolidated Report. South Florida Water Management District, West Palm Beach, FL. <http://www.sfwmd.gov/sfer/>
- 2000** Rumbold, D.G. Appendix 7.3b: Methylmercury risk to Everglades wading birds: a probabilistic ecological risk assessment. *In* 2000 Everglades Consolidated Report. South Florida Water Management District, West Palm Beach, FL. http://www.sfwmd.gov/org/ema/everglades/consolidated_00/ecr2000/appendices/ appendix07_3%20_7_6.pdf
- 2000** Rumbold, D.G. Contaminants in wildlife inhabiting the area around Palm Beach County's North County Resource Recovery Facility: 1989 – 1999. Final report to the Solid Waste Authority of Palm Beach County, February 2000, West Palm Beach, FL.
- 1999** Fink, L., Rumbold, D.G., and Rawlik, P. The Everglades mercury problem. *In* Everglades Interim Report. South Florida Water Management District, West Palm Beach, FL.
- 1999** Rumbold, D.G., Fink, L. Appendix 7.4: Confounding evidence for the “Inverse Relationship” between total phosphorus in the water column and mercury in mosquitofish. *In* Everglades Interim Report. South Florida Water Management District, West Palm Beach, FL.
- 1997** Rumbold, D.G. An evaluation of the potential impacts of increased nutrient fluxes across the air-sea interface and neuston response. Environmental Science and Engineering Fellows Program: 1997 Reports. AAAS, Washington, DC. (for Executive Summary, see <http://es.epa.gov/ncer/publications/archive/aaas97.html>).

- 1993** Rumbold, D.G. Ontology of the early life-stages of meroneustonic reef species in the sea-surface microlayer in the Florida Key. Pages 1-17 *In* S. Snedaker (ed.). Man-land-ocean interactions in the upper Florida Keys: alternatives for conservation and development. Report to the John D. and Catherine T. MacArthur Foundation. RSMAS, Univ. Miami. Miami, FL.
- 1991** Rumbold, D.G. Biomonitoring for chemical contaminants. *Florida Beacon*, 5:3-4.

Invited Presentations

- 2009** Rumbold, D. Mercury: Global contaminant with Local Impacts. Invited Presentation. 2009 Scripps Howard Institute on the Environment. Florida Atlantic University, Jupiter, FL. June 1-6
- 2009** Rumbold, D. South Florida Mercury Science Program: Lessons Learned. Invited Presentation. Gulf of Mexico Alliance, 2nd Annual Monitoring Forum. New Orleans, April 7-8 2009.
- 2006** Rumbold, D.*, Neimeyer, N. Mercury monitoring program for Everglades (Florida, USA) Restoration: 1. Multi-scale abiotic. Invited Presentation for the 8th International Conference on Mercury as a Global Pollutant, Madison, Wisconsin, USA; August 6-11, 2006.
- 2006** Lange, T.*, Rumbold, D., Neimeyer, N. Mercury monitoring program for Everglades (Florida, USA) Restoration: 2. Multi-scale biotic. Invited Presentation for the 8th International Conference on Mercury as a Global Pollutant, Madison, Wisconsin, USA; August 6-11, 2006.
- 2006** Rumbold, D.G.*, Lange, T. The efficacy of monitoring water-column concentrations of mercury in canals to predict problem areas in downstream Everglades' marshes. Invited Presentation for the 14th International Conference on Environmental Bioindicators. Baltimore, Maryland. April 24-26, 2006.
- 2005** Rumbold, D.*, Fink, L., Pfeuffer, R., Bechtel, T. A phased, multi-tiered approach for adaptive assessment and monitoring potential toxicants at individual projects of the Comprehensive Everglades Restoration Plan. Invited Presentation at the Annual Meeting of the Society of Risk Analysis, Orlando, FL. December 4-7, 2005.
- 2001** Rumbold, D.G.*, Fink, L.E., Laine, K.A., Niemczyk, S.L., Chandrasekhar, T. Levels of mercury in alligators collected along a transect through the Florida Everglades. Invited Presentation to the Florida Electric Power Coordinating Group. West Palm Beach, FL. May 11, 2001.

Select Contributed Presentations (Asterisk* designates a presentation by that co-author or ** student at a meeting)

- In prep** Thera, J.C.**, & Rumbold D.G. Mercury Concentrations in King Mackerel (*Scomberomorus cavalla*) from Southwest Florida. 30th Annual Meeting of Society of Environmental Toxicology and Chemistry. New Orleans, LA.
- In prep** Brandon, A.**, Cunningham, M., Onorato, D., & Rumbold, D.G. Spatial and Temporal Patterns in Mercury Concentrations in Blood and Hair of Florida Panthers (*Puma concolor coryi*): 1978 – 2008. 30th Annual Meeting of Society of Environmental Toxicology and Chemistry. New Orleans, LA.
- 2009** Easton, J.A.**, D.G. Rumbold, and R.B. Erdman. Mercury concentrations in *Pinctada longisquamosa* and *Isognoman alatus* from anchilaine lakes on San Salvador Island, Bahamas. 13th Symposium on the Natural History of the Bahamas. Gerace Research Centre, San Salvador, Bahamas. June 18-22, 2009.

- 2008** Evans, D.W.*, & Rumbold, D.G. Mercury Bioaccumulation in Florida Bay Fish: Why So High? Presented at the 2008 Florida Bay and Adjacent Marine Systems Science Conference. Naples, FL. December 8-11, 2008
- 2008** Thera, J.C.**, Haynes, L. & Rumbold D.G. Fine Scale Spatial Variation in Total Mercury levels in Southwest Florida Molluscan Bivalves. Presented at Presented at the 29th Annual Meeting of Society of Environmental Toxicology and Chemistry. Tampa, FL November 16-20, 2008.
- 2007** Gilmour, C.C.*, Orem, W.H., Krabbenhoft, D., Aiken, G.R., Rumbold, D. Sulfur Contamination of the Everglades: Effects on Methylmercury Production and Implications for Ecosystem Restoration. Presented at the Annual meeting of the American Society of Limnology and Oceanography (ASLO), Santa Fe, New Mexico. February 4-9, 2007
- 2006** Rumbold, D.G. Ecological Risk at a Methylmercury Hot Spot in the Florida Everglades. Presented at the 27th Annual Meeting of Society of Environmental Toxicology and Chemistry. Montréal, Québec, Canada. November 5-9, 2006
- 2004** Rumbold, D.G.*, Niemeyer, N., Fink, L., Evans, D., and Krabbenhoft, D. Source identification of Florida Bay's methylmercury problem: Mainland runoff versus atmospheric deposition and *in situ* production. Presented at the Society of Environmental Toxicology and Chemistry 4th World Congress. Portland, Oregon. 14-18 November 2004.
- 2003** Evans, D.W.*, Crumley, P.H., Rumbold, D.G., and Niemczyk, S. Mercury in Fish from Eastern Florida Bay. Presented at the 2003 Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem. Palm Harbor, Florida. 13-18 April 2003.
- 2001** Brown, D.J.*, Chu, M.D., Axelrad, D., Rumbold, D.G., Chu, A.H. and Clark, G.C.,. Use of the CALUX® bioassay for dioxins in an incinerator biomonitoring program. Presented at the 22nd Annual Meeting of the Society of Environmental Toxicology and Chemistry. Baltimore, Maryland, USA, 11 - 15 November 2001.
- 2000** Rumbold, D.G. Assessment of methylmercury risk to three species of wading birds in the Florida Everglades. Presented at the 3rd workshop on “Practical Issues in the use of Probabilistic Risk Assessment.” NIEHS / USEPA. 16-18 April 2000. Safety Harbor, FL.
- 1992** Rumbold, D.G.*, Bruner, M.C., Marti, E.A., Evans, V.D., Grohse, P.M., and Binstock, D.A. Ecotoxicological surveillance program on wildlife in the vicinity of a resource recovery facility: a baseline study. Presented at the annual meeting of the Southeastern Regional Chapter of the Society of Environmental Toxicology and Chemistry. Gainesville, Florida. 7 March 1992.
- 1991** Rumbold, D.G.*, and Bruner, M.C.. Community level approach for impact assessment on a communal roost of the endangered Snail Kite (*Rostrhamus sociabilis plumbeus*). Presented at the annual meeting of the Society for Conservation Biology. Madison, Wisconsin. 18-22 June 1991.
- 1989** Rumbold, D.G. Monitoring effects of close proximity site clearing and industrial development on a mixed species heronry and Snail Kite roost. Presented at the annual meeting of the Colonial Waterbird Society. Key Largo, Florida. 26-29 October 1989.