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Education

Ph.D., University of Rhode Island, Oceanography, 1975

B.S., Fordham University, Biology, 1969

Positions

2001-present Research Professor, Department of Earth and Planetary Sciences, University of Tennessee, Knoxville, Tennessee

1995-2001 Distinguished Research Scientist, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

1980-1995 Research Staff Member and Senior Scientist, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

1979-1980 Research Associate, University of Tennessee,

1976-1979 Postdoctoral Investigator, Oak Ridge National Laboratory

Professional Activities and Recognition

“Highly Cited Researcher” by ISI Web of Knowledge (*ISI Highly Cited.com*).

Opening Speaker, International Symposium on Colloids and Colloid-Facilitated Transport of Contaminants in Soil, Danish Institute of Agricultural Sciences, Foulum, Denmark, September 2002.

Keynote Speaker, Symposium on Colloidal Particles in Environmental Processes. American Chemical Society, Anaheim, California, April 1999.

Keynote Speaker, Symposium on Role of Humic Substances in Transport of Xenobiotics and Metals. 89th Annual Meeting of the Soil Science Society, Anaheim, California, October 1997.

Keynote Speaker, Symposium on Basic and Applied Research in Soil Science: Bridging the Gap. 89th Annual Meeting of the Soil Science Society, Anaheim, California, October 1997.

Keynote Speaker, Symposium on Isolation, Fractionation, Characterization and Reactivity of Environmental Colloids. Annual Meeting of the American Chemical Society, Las Vegas, Nevada, September 1997.

Keynote Speaker, Symposium on Colloids and Colloid-Assisted Contaminant Transport at the XXII General Assembly of the European Geophysical Society in Vienna, Austria, April 1997.

Keynote Speaker and Session Chair, Workshop on Colloids in Groundwater, Swiss National Research Foundation's Priority Program for the Environment, Geneva, Switzerland, October 1995.

Keynote Speaker, Commission of European Community's Natural Analogue Working Group Meeting, Santa Fe, New Mexico, September 1994.

Recipient of the Editor's Citation for Excellence in Technical Reviewing for *Water Resources Research*, presented by the American Geophysical Union, May 1993.

Organizing Committee and Session Chair, EPA Workshop on Groundwater Sampling. U.S. Environmental Protection Agency, December 1993.

Organizer and Chairman, Symposium on Colloid-Facilitated Transport in Groundwater, American Geophysical Union, December 1992

Member of the United Nation's Environmental Program's Scientific Advisory Committee for the Marine Mammal Action Program.

Subprogram Coordinator for Colloid Research within the Subsurface Transport Program of the U.S. Department of Energy, 1986-1994.

Keynote Speaker, International Conference on Organic Substances in Soil and Water, Lancaster, UK, September 1992.

Keynote Speaker, International Humic Substances Society Meeting, Bari, Italy, September, 1992.

Organizer and Chairman of three international symposia on groundwater colloids: "Transport of Contaminants in the Subsurface: Role of Organic and Inorganic Colloidal Particles" (1986), "Mobility of Colloidal Particles in the Subsurface: Chemistry and Hydrology of Colloid-Aquifer Interactions" (1988), and "Concepts for Manipulating Groundwater Colloids for Environmental Restoration (1990).

Co-organizer of Symposium on Organics in Sediments (Biological Processes). American Chemical Society, Boston, Mass. April 1990.

Organizer and Co-chairman of a Symposium on Biological Markers of Environmental Contamination. American Chemical Society, Los Angeles, Calif., November 1988. Editor of Symposium Proceedings published by Lewis Publishers.

Keynote Speaker at the Symposium on the Effects of Aquatic Humics on the Fate and Treatment of Pollutants. American Chemical Society, Denver, Colo. April 1987.

Invited Presentations to National Research Council (NRC) Committee on Biological Markers (April 1986) and to NRC Committee on Animal Sentinels of Environmental Contamination (May 1988).

Patents

United States Patent 6,229,146. May 2001. Position sensitive radioactivity detection for gas and liquid chromatography

Publications

Books:

McCarthy, J. F., and F. J. Wobber. 1993. Manipulation of Groundwater Colloids for Environmental Restoration. Lewis Publishers, Chelsea, MI. 320 p.

McCarthy, J. F., and L. R. Shugart (eds.). 1990. Biomarkers of Environmental Contamination. Lewis Publishers. Chelsea, Mich. 457pp.

Journal Articles and Book Chapters:

- Crist, J.T., Y. Zevi, J.F. McCarthy, J.A. Throop, and T.S. Steenhuis. 2005. Transport and retention mechanisms of colloids in partially saturated porous media. *Vadose Zone Journal* (in press).
- Mayer, L.M., L.L. Schick, K.R. Hardy, R. Wagai and J.F. McCarthy. Organic matter content of small mesopores in sediments and soil. *Geochim. Cosmochim. Acta* 68(19): 3863-3872.
- McCarthy, J. F. and L.D. McKay. 2004. Colloid transport in the subsurface: past, present, and future challenges. *Vadose Zone J.* 3(2): 326-337.
- Crist, J.T., J.F. McCarthy, P.C. Baveye, J.A. Throop, and T.S. Steenhuis. 2004. Pore-scale visualization of colloid transport and retention in partly saturated porous media. *Vadose Zone J.* 3(2): 444-450.
- Palumbo, A.V., J.F. McCarthy, J.E. Amonette, L.S. Fisher, S.D. Wulfschleger, W.L. Daniels. 2004. Prospects for Enhancing Carbon Sequestration and Reclamation of Degraded Lands with Fossil-Fuel Combustion By-products. *Advan. Environ. Res.* 8:425-438.
- McCarthy, J. F., L.W. Burrus and V. R. Tolbert. 2003. Bioaccumulation of benzo(a)pyrene from sediment by fathead minnows: effects of organic content, resuspension and metabolism. *Arch. Environ. Contamin. Toxicol.* 45:364-370.
- McCarthy, J. F., L.D. McKay, and D.D. Bruner. 2002. Influence of Ionic Strength and Cation Valence on Transport of Colloidal Particles in Fractured Shale Saprolite. *Environ. Sci. Technol.* 36:3735-3743.
- Shevenell, L and J. F. McCarthy. 2002. Effects of precipitation events on colloids in a karst aquifer. *J. Hydrol.* 255(1/4): 50-68.
- McCarthy, J. F. 2001. Subsurface transport of dissolved humic substances and associated contaminants. In *Humic Substances and Chemical Contaminants*, C. E. Clapp, M. H. B. Hayes, N. Sensi, P. R. Bloom, and P. M. Jardine. Soil Science Society of America, Madison, WI, Chapter 21, p. 429-448.
- McCarthy, J. F., K. M. Howard, and L. D. McKay. 2000. Effect of pH on the sorption and transport of fluorobenzoic acid groundwater tracers in shale saprolite. *J. Environ. Qual.* 18(6):1806-1817.
- McCarthy, J. F., G. R. Southworth, K. Ham, and J. A. Palmer. 2000. Time-integrated, flux-based monitoring using semipermeable membrane devices to estimate the contribution of industrial facilities to regional PCB budgets. *Environ. Toxicol. Chem.* 19(2):352-359.
- McCarthy, J. F., W. E. Sanford, and P. L. Stafford. 1998. Lanthanide field tracers demonstrate enhanced transport of transuranic radionuclides by natural organic matter. *Environ. Sci. Technol.* 32(24):3901-3906.
- McCarthy, J. F and L. Shevenell. 1998. Processes controlling colloid composition in a fractured and karstic aquifer in eastern Tennessee, USA. *J. Hydrol.* 206(3-4):191-218.
- McCarthy, J. F. 1998. Colloid-facilitated transport of contaminants in groundwater: mobilization of transuranic radionuclides from disposal trenches by natural organic matter. *Physics and Chemistry of the Earth* 23(2):179-185.
- McCarthy, J. F., K. R. Czerwinski, W. E. Sanford, P. M. Jardine and J. D. Marsh. 1998. Mobilization of transuranic radionuclides from disposal trenches by natural organic matter. *J. Contam. Hydrol.* 30: (1-2) 49-77.

- McCarthy, J. F. and L. Shevenell. 1998. Obtaining representative ground water samples in fractured and karst formations. *Ground Water* 36(2):251-260.
- Adams, S. M., C. C. Brandt, D. S. Cicerone, S. W. Christensen, M. S. Greeley, Jr., W. R. Hill, M. A. Huston, L. A. Kszos, J. F. McCarthy, M. J. Peterson, M. G. Ryon, J. G. Smith, G. R. Southworth, And A. J. Stewart. 1998. Oak Ridge Y-12 Plant Biological Monitoring and Abatement Program (BMAP) Plan. Y/TS-1613/R1 (in press).
- Mas-Pla, J., T.-C. J. Yeh, T.M. Williams and J.F. McCarthy. 1997. Analyses of slug tests and hydraulic conductivity variations in the near field of a two-well tracer experiment site. *Ground Water* 35 (3): 492-501.
- McCarthy, J. F., B. Gu, L. Liang, J. Mas-Pla, T. M. Williams and T.-C. J. Yeh. 1996. Field tracers tests on the mobility of natural organic matter in a sandy aquifer. *Water Resources Res.* 32(5): 1223-1228.
- Pfiffner, S.M., A. V. Palumbo, T. Gibson, D. B. Ringelberg and J. F. McCarthy. 1997. Relating Groundwater and Sediment Chemistry to Microbial Characterization at a BTEX-Contaminated Site. *Appl. Biochem. Biotechnol.* 63-65:775-788..
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- Sun L., Perdue E. M., and McCarthy J. F. 1995. Using reverse-osmosis to obtain organic-matter from surface and ground waters. *Water Research* 29(6): 1471-1477
- McCarthy, J. F. 1995. Natural analogue studies of the role of colloids, natural organics and microorganisms on radionuclide transport. IN J. Smellie and D. Curtis. *Proceedings of the Sixth CEC Natural Analogue Working Group Meeting.* Commission of European Communities.
- Gu, B., T. Mehlhorn, L. Liang and J. F. McCarthy. 1996. Competitive adsorption, displacement, and transport of organic matter on iron oxide: I. competitive adsorption. *Geochim. Cosmochim. Acta.* 60:1943-1950.
- Gu, B., T. Mehlhorn, L. Liang and J. F. McCarthy. 1996. Competitive adsorption, displacement, and transport of organic matter on iron oxide: II. Displacement and transport. *Geochim. Cosmochim. Acta.* 60:2977-2992.
- Burlage, R. S., A. V. Palumbo, and J. F. McCarthy 1995. Signal quantification of bacteria for a groundwater transport experiment. pp. 139-148. In R. E. Hinchee, J. Fredrickson, and B. C. Alleman [eds.]. *Bioaugmentation for Site Remediation.* Battelle Press, Columbus.
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- Yeh, T.-C., J. Mas-Pla, T. M. Williams, and J. F. McCarthy. 1995. Modeling of Natural Organic Matter Transport Processes in Groundwater. *Environ. Health Perspect.* 103 (Suppl 1): 41-46.
- Gu, B., J. Schmitt, Z. Chen, L. Liang and J. F. McCarthy. 1995. Adsorption-desorption of different organic matter fractions on iron-oxide. *Geochim. Cosmochim. Acta* 59:219-229.

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- McCarthy, J. F. 1993. Subsurface transport of natural organic matter: Implications to contaminant transport. IN A. C. Beck, K. C. Jones, M. B. Hayes, and U. Mingelgrin (Eds.) Organic Substances in Soil and Water: Natural Constituents and their Influences on Contaminant Behavior. Royal Society of Chemistry, Cambridge UK. Chapter 8, pp. 152-170.
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- Palumbo, A. V., J. F. McCarthy, A. Parker, S. Pfiffner, F. S. Colwell and T. J. Phelps. 1994. Potential for microbial growth in arid subsurface environments. *Appl. Biochem. Biotechnol.* 45/46:823-834.
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- Sun, L, E. M. Perdue, and J. F. McCarthy. 1994. Using reverse osmosis to obtain organic matter from surface and ground waters. IN N. Senesi and T. M. Miano (Ed.) Humic Substances in the Global Environment. Elsevier Publishers, Amsterdam 901-910.
- McCarthy, J. F. 1993. The future of nondestructive biomarkers. IN C. Fossi and C. Leonzio (Eds) Nondestructive Biomarkers in Vertebrates Lewis Publishers/CRC Press, Boca Raton, FL. pp. 305-316.
- McCarthy, J. F., T. M. Williams, L. Liang, P. M. Jardine, A. V. Palumbo, L. W. Jolley, L. W. Cooper, and D. L. Taylor. 1993. Mobility of natural organic matter in a sandy aquifer. *Environ. Sci. Technol.*, 27:667-676.
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- Liang, L., J. F. McCarthy and T. M. Williams. 1993. Iron dynamics following injection of dissolved organic matter into a sandy aquifer. In J. F. McCarthy and F. J. Wobber (Ed.).

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- J. E. Saiers, J. F. McCarthy, P. M. Jardine, L. Liang, and G. M. Hornberger. 1993. Transport of amorphous TiO₂ through homogeneous and structurally heterogeneous porous media. In McCarthy, J. F. and F. J. Wobber (Eds.). Manipulating Groundwater Colloids for Environmental Restoration. Lewis Publishers, Chelsea MI, 320p; pp. 309-312.
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- Mas-Pla, J., T.-C. Jim Yeh, J. F. McCarthy, and T. M. Williams. 1992. Numerical simulation of a two-well tracer experiment. *Ground Water* 30:958-964.
- Shugart, L. R., J. F. McCarthy, and R. S. Halbrook. 1992. Biological markers of environmental and ecological contamination: an overview. *Risk Analysis* 12:353-360.
- Williams, T. M., and J. F. McCarthy. 1991. Field scale tests of colloid-facilitated transport. In National Research and Development Conference on Control of Hazardous Materials. Hazardous Materials Control Institute, Greenbelt, Maryland; ISBN 0-944989-96-9. p. 179-184.
- Beauchamp, J. J., J. F. McCarthy, David H. Rosenblatt, and L. R. Shugart. 1992. Statistical design for sampling and analysis of animal populations for chemical contamination. *Risk Analysis* 12:233-238.
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- Jardine, P.M., F. M. Dunnivant, H. M. Selim, and J. F. McCarthy. 1992. Comparison of models for describing the transport of dissolved organic carbon in laboratory columns containing aquifer material. *Soil Sci. Soc. Amer. J.* 26:393-401.
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- McCarthy, J. F., and T. J. Tschplinski. 1991. Biological markers in environmental sentinels to establish exposure to, and effects of, atmospheric pollutants. In T. J. Moser, J. R. Barker, and D. T. Tingey, (Eds.). Ecological Exposure and Effects of Airborne Toxic Chemicals. U. S. Environmental Protection Agency; Corvallis, Oregon. EPA Report No.: 600/3-91/001. pp107-127.
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- Kukkonen, J., J. F. McCarthy, and A. Oikari. 1991. Binding and bioavailability of organic micropollutants in natural waters: Effects of quality and quantity of dissolved organic material. In R. A. Baker (Ed.). Organic Substances and Sediments in Water. Lewis Publishers, Chelsea, Mich. p. 111-128.
- McCarthy, J. F., P. F. Landrum, and A. V. Palumbo. 1991. Organic contaminants in sediments: Biological processes. In R. A. Baker (Ed.). Organic Substances and Sediments in Water. Lewis Publishers, Chelsea, Mich. p. 3-24.
- Black, M. C., and J. F. McCarthy. 1990. Effects of acute temperature change on respiration and toxicant uptake by rainbow trout, Salmo gairdneri. Physiol. Zool. 64:145-168.
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- Jardine, P. M., N. Weber, and J. F. McCarthy. 1990. Chemical and hydrologic factors controlling the transport of organic colloids. Haz. Mater. Control 3:44.
- McCarthy, J. F., and L. R. Shugart. 1990. Biomarkers of environmental contamination. pp. 3-16. In J. F. McCarthy, and L. R. Shugart, (eds.), Biomarkers of Environmental Contamination. Lewis Publishers, Chelsea, Mich.
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- McCarthy, J. F. 1990. Implementation of a biomarker-based environmental monitoring program. pp. 429-440. In J. F. McCarthy and L. R. Shugart (eds.), Biomarkers of Environmental Contamination. Lewis Publishers, Chelsea, Mich.
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- Kukkonen, J., J. F. McCarthy, and A. Oikari. 1990. Effects of XAD-8 Fractions of dissolved organic carbon on the sorption and bioavailability of organic micropollutants. Arch. Environ. Contam. Toxicol. 19:551-557.
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