

Karen J. Murray, Ph.D.
Senior Scientist

Professional Profile

Dr. Karen J. Murray is a Senior Scientist in Exponent's Environmental Sciences practice. She has 8 years experience investigating the interactions between environmental bacteria, metals, and mineral surfaces, and determining the role these play in the fate of contaminant metals.

Dr. Murray has published peer-reviewed papers on the potential for biological oxidation of Cr(III) to the more toxic Cr(VI) in marine and freshwater systems, as well as biological Mn oxidation, Co oxidation, and Hg methylation. She has experience in field sampling in marine, freshwater, and soil systems. Her analytical expertise includes aerobic and anaerobic microbial culturing techniques, electrochemical and spectroscopic chemical analyses, and molecular biological methods.

Dr. Murray has studied the changing toxicity of metals to bacteria under various environmental conditions, and participated in the University of California Toxic Substances Research and Teaching program. She has reviewed journal publications and research grant proposals on environmental metal contaminants and water quality projects.

Academic Credentials and Professional Honors

Ph.D., Oceanography (Geochemistry), Scripps Institution of Oceanography, University of California, 2005

B.S., Environmental Engineering Science, Massachusetts Institute of Technology, 1999

Recipient of the Environmental Protection Agency STAR graduate fellowship

Publications

Murray KJ, Webb SM, Bargar JR, Tebo BM. Indirect oxidation of Co(II) in the presence of the marine Mn(II)-oxidizing bacterium *Bacillus* sp. strain SG-1. *Applied and Environmental Microbiology* 2007; 73(21):6905–6909.

Murray KJ, Tebo BM. Cr(III) is indirectly oxidized by the Mn(II)-oxidizing bacterium *Bacillus* sp. strain SG-1. *Environmental Science and Technology* 2007; 41:528–533.

Glazer BT, Luther III GW, Konovalov SK, Friederich GE, Nuzzio DB, Trouwborst RE, Tebo BM, Clement B, Murray K, Romanov AS. Documenting the suboxic zone of the Black Sea via high-resolution real-time redox profiling. *Deep-Sea Research* 2006; 53:1740–1755.

Murray KJ, Mozafarzadeh ML, Tebo BM. Cr(III) oxidation and Cr toxicity in cultures of the manganese(II)-oxidizing *Pseudomonas putida* strain GB-1. *Geomicrobiology Journal* 2005; 22:151–159.

Tebo BM, Bargar JR, Clement BG, Dick GJ, Murray KL, Parker D, Verity R, Webb SM. Biogenic manganese oxides: Properties and mechanisms of formation. *Annual Review of Earth and Planetary Sciences* 2004; 32:287–328.

Konovalov SK, Luther GW, Friedrich GE, Nuzzio DB, Tebo BM, Murray JW, Oguz T, Glazer B, Trouwborst RE, Clement B, Murray KJ, Romanov AS. Lateral injection of oxygen with the Bosphorus plume—Fingers of oxidizing potential in the Black Sea. *Limnology and Oceanography* 2003; 48(6):2369–2376.

Jay JA, Murray KJ, Gilmour CC, Mason RP, Morel FMM, Roberts AL, Hemond HF. Mercury methylation by *Desulfovibrio desulfuricans* ND132 in the presence of polysulfides. *Applied and Environmental Microbiology* 2002; 68(11):5741–5745.

Published Abstracts

Murray KJ, Tebo BM. Active bacterial Mn(II)-oxidation accelerates Cr(III) oxidation compared to abiotic oxidation by Mn minerals. *Geochimica et Cosmochimica Acta* 2005; 69(10):A456–A456 Suppl. S.

Murray KJ, Tebo BM. Cr(III) is indirectly oxidized by the Mn(II)-oxidizing bacterium *Bacillus* sp. Strain SG-1. *Abstracts of Papers of the American Chemical Society* 2005; 228:U896-U896 089-Geoc Part 1.

Murray KJ, Mozafarzadeh ML, Tebo BM. Role of manganese(II)-oxidizing bacteria in chromium (III) oxidation. *Abstracts of papers of the American Chemical Society* 2004; 227:U1212-U1212 124-Geoc Part 1.

Book Chapter

Konovalov SK, Murray JW, Luther GW, Buesseler KO, Friedrich G, Tebo BM, Samodurov AS, Gregoire M, Ivanov LI, Romanov AS, Clement B, Murray K. Oxygen fluxes, redox processes and the suboxic zone in the Black Sea. In: Oceanography of the Eastern Mediterranean and Black Sea: Similarities and Differences of Two Interconnected Basins. Yilmaz A (ed), Tübitak Publishers, pp. 566–577, Ankara, Turkey, 2003.

Prior Experience

Postdoctoral Researcher, Soil and Environmental Biogeochemistry Lab, Stanford University, 2005–2007

Professional Affiliations

- American Chemical Society
- American Geophysical Union