

B. Lea Cox, Ph. D.

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**Objective:** combine my research and analytical scientific skills with my visual and communication skills to communicate science

### Science Education:

**Ph.D.** 1995, University of California Berkeley, Soil Science ; Dissertation title: “Reductive Dissolution of Iron Oxide Minerals by *Shewanella Putrefaciens* BrY”. Major advisor: Dr. Garrison Sposito; Major fields: Soil Microbiology, Soil Chemistry, Pedology.

**M.S.** 1983, University of Arizona, Tucson, Earth Sciences Department. Thesis title: Finite Element Stress Modeling of the Nazca Plate. Major advisor: Dr. Randall Richardson; Major fields: ore deposits, geothermal modeling of heat and fluid flow, numerical modeling of plate tectonics.

**B.S.** 1976, Portland State University, Portland, Oregon, Earth Sciences Department. Major advisor: Dr. Marvin Beeson; Major fields: Computer Modeling, Volcanology, Mineralogy, Field Geology.

Summer Field Geology Camp, 1976, Oregon State University, Corvallis. Mapping in Central Oregon John Day Area, volcanic stratigraphy, sedimentary stratigraphy.

### Digital Media Education

**M.F.A.** *Digital Arts and New Media*, June 2008, University of California, Santa Cruz. <http://danm.ucsc.edu/web/bcox/thesisproject> (Developed Audiotour of the UCSC Arboretum; recorded nature sounds and created birdsong compositions linked to video)

### Science Experience:

**Medical Research:** Independent Contractor, December 2008 to March 2009. Comprehensive literature review of Lyme Disease and *Borrelia burgdorferi*, Christine Green, M.D.

**Research Faculty,** Donald Bren School of Environmental Science and Management, University of California, Santa Barbara, CA, July 2003 to July 2004. Mentored graduate student and wrote and initiated proposals on bioremediation with Professor Patricia Holden, one of which one was funded (EPA-Biological effects of Quantum Dots).

**Research Associate,** Geobiology, University of Southern California, Los Angeles, CA,

October, 2001 to March, 2003. Advisor: Professor Kenneth Nealson. Continuing research on magnetotactic bacteria and other metal and oxidizing bacteria; comparative genomics of bacteria; nanocellular organisms.

**Postdoctoral Fellow**, Astrobiology Program, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA, April, 1998 to October, 2001. Advisor: Dr. Kenneth Nealson. Study of microbial/mineral interactions, including dissolution and precipitation iron and manganese; isolation and characterization of magnetotactic bacteria; biological iron fractionation by bacteria; applications of electron microscopy and X-ray spectromicroscopy to the study of biomineralization; 1999 - Visiting Scientist, Soil Science Department, Aarhus University, Aarhus, Denmark. Hosts: Per Nornberg, Erik Uggerhoj. Presented a seminar and started collaborations involving magnetic soils, magnetotactic bacteria, spectromicroscopy, and a Mars Chamber.

**Senior Research Associate**, Earth Sciences Division, Lawrence Berkeley Laboratory, 1984 -1998. Computer simulations of heat and fluid flow in fractures; laboratory fracture experiments; fractal geometry applied to subsurface hydrology.

**Visiting Scientist**, Atomic Physics Department, Eotvos Lorand University, Budapest, Hungary, Fall, 1996. Host: Dr. Tamas Vicsek; Research in visualization of bacterial dissolution; presentation of seminar.

**Geologist**, Union Oil Company, Geothermal Division, Santa Rosa, CA, 1983-1984. Field geology in Oregon and Nevada; report writing.

**Summer Geophysical Intern**, Sohio Oil Company, San Francisco, CA, 1982. Seismic interpretation of Prudhoe Bay oilfield data.

**Graduate Teaching Assistant**, University of Arizona, Tucson, 1981. Teaching mineralogy lab sections to both geology majors and to mining engineer majors.

**Geologist**, Geothermex, Inc., Richmond, CA, 1979-1980; and summer of 1981. Geothermal field exploration in Idaho, Utah, Nevada, New Mexico, and California.

**Project Geologist**, Geothermal Services, Inc., San Diego, CA, 1977-1978. Geothermal field exploration in Nevada, Utah, and New Mexico.

## Journal Publications

Schübbe, Sabrina, Williams, Timothy J., Xie, Gary, Kiss, Hajnalka E., Brettin, Thomas S., Martinez, Diego, Ross, Christian A., Schöler, Dirk, **Cox, B. Lea**, Nealson, Kenneth H., and Bazylinski\*, Dennis A., 2009. Complete genome sequence of the chemolithoautotrophic marine magnetotactic coccus strain MC-1, *Appl. Environ. Microbiol.*:10.1128/AEM.02874-08.

Cox, B.L. and Nealson, 2005, *Nucleic Acids Speak Volumes Astrobiology*, Accepted, in revision.

Beard, B.L., Johnson, C.M., Skulan, J.L., Nealson, K.H., **Cox, L.**, and Sun, H., 2003. Application of Fe isotopes to tracing the geochemical and biological cycling of Fe, *Chemical Geology*, 195: 87-117.

Pecher, K., McCubbery, D., Kneeder, E., Rothe, J., Bargar, J., Meigs, G., **Cox, L.**, Nealson, K., and Tonner, B., 2003. Quantitative charge state analysis of manganese biominerals in aqueous suspension using Scanning Transmission X-ray Microscopy (STXM), *Geochim. Cosmochim. Acta* 67: 1089-1098.

Nealson, K.H. and **Cox, B.L.**, 2002. Microbial metal-ion reduction and Mars: extraterrestrial expectations? *Current Opinion in Microbiology* 5: 296-300.

**Cox, B.L.**, Popa, R., Bazylinski, D.A., Lanoil, B., Douglas, S., Belz, A. Engler, D.L. and Nealson, K.H., 2002. Organization and elemental analysis of P-, S-, and Fe-rich inclusions in a population of freshwater magnetococci, *Geomicrobiology Journal*, 19: 387-406.

Bergmann, U., Glatzel, P., Robblee, J. H., Messinger, J., Fernandez, C., Sauer, K., Yachandra, V. K., Klein, M. P., **Cox, B. L.**, Nealson, K. H., Cramer, S. P., 2001. High resolution x-ray spectroscopy of rare events: A different look at local structure and chemistry. *J. Synchrotron Rad.* 8, 199-203.

Beard, B.L., Johnson, C.M., **Cox, L.**, Sun, H., Nealson, K.H. and Aguilar, C., 1999, Iron Isotope Biosignatures, *Science* 285, 1889-1892.

**Cox, B.L.** and Wang, J.S.Y., 1993. Fractal Analyses of Anisotropic Fracture Surfaces, *FRACTALS* vol 1, (3), 547-559; also published in *FRACTALS IN NATURAL SCIENCES*, (T. Vicsek, M. Shlesinger and M. Matsushita, editors), World Publishing, 253-265.

**Cox, B.L.** and Wang, J.S.Y., 1993. Fractal Surfaces: Measurement and Applications in the Earth Sciences, *Fractals* vol 1, (1), 87-115; also published in *SYMMETRY: Culture and Science*, vol 4 (3) 243-283.

**Cox, B.L.** and Pruess, K., 1990. Numerical Experiments on Convective Heat Transfer in Water-Saturated Porous Medium at Near-Critical Conditions, *Transport in Porous Media*, v5: 299-323.

Bodvarsson, G.S., **Cox, B.L.** and Ripperda, M., 1987. Effects of Steam/Liquid Counterflow on Pressure Transient Data From Two-Phase Geothermal Reservoirs, *Soc. Petrol. Engineering Reservoir Engineering*, May, 1987, 187-193.

Richardson, R.M., and Appl. Environ. Microbiol. doi:10.1128/AEM.02874-08., 1984.  
Evolution of Oceanic Lithosphere: A Driving Force Study of the Nazca Plate, Journal  
Geophys. Res., vol 89 (B12), 10,043-10,052.

Elders, W.A., D.K.Bird, A.E.,Williams, P. Schiffmann, and B. Cox, 1982, "A model of the  
heat source of 5088-260-1746.the Cerro Prieto magma hydrothermal system, Baja Cali-  
fornia, Mexico,Proceeding of the Fourth Symposium on the Cerro Prieto geothermal  
field, Vol.1,p. 265-284.