Anthony Q. Armstrong

Curriculum Vitae
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RESEARCH INTERESTS

I am environmental health scientist in the Society, Energy, and Environment (SEE) group, Environmental Sciences Division, at the Oak Ridge National Laboratory. My work is focused on health assessment and development of computational methods in the areas of microbial and chemical hazard exposure modeling, with an emphasis on uncertainty, risk, and decision analytics. Areas of application include quantitative microbial and chemical hazard assessment, toxicological data analytics, and environmental risk. Quantifying uncertainty and risk as well as understanding the implications of both for decision making is a recurring theme in my work. I currently serve as team lead for the Health Risk and Regulatory Analysis Team within the SEE group.

EXPERIENCE

Team Lead and Senior Research Staff, Health Risk and Regulatory Analysis

2018 – present

As team lead, I oversee a diverse and talented group of ORNL staff, post-docs, interns and students. Research by this team spans a wide spectrum of expertise including health science, toxicology, environmental chemistry, exposure and dose response modeling and simulation, visualization, and data analytic challenges applied to environmental health research domains. As researcher, my work is typically computational in nature with a focus on microbial and chemical hazard assessments, development of health protective guidelines, uncertainty analysis, risk, and decision support. As a PI, I currently lead the Military Occupational and Environmental Health Assessment for Multiple Hazards Project for DoD, Risk Analysis and Toxicological Decision-Making Research Project for EPA, and significantly contribute to a number of other projects within the SEE Group.

Senior Research Staff, Human Health Risk and Environmental Analysis Group

2007 – 2017

Activities included serving as principle investigator, technical lead, and in most cases point of contact with sponsoring agencies such as the Department of Energy, Department of Defense and Environmental Protection Agency. Efforts centered largely on management and development of computational risk methods for environmental health assessments.

PI for DoD, Army Public Health Center, Military Exposure Guidelines (MEG) project providing analyses and development of exposure guidelines for military personnel. Our team developed exposure assessments, advanced models for dose response data for military relevant toxicants, and health-risk based models.

Co-PI for DoD, in the analysis and development of consequence management (CM) tools for response to chemical/biological incidents. This effort provided an enhanced approach to CM including incorporation of the best tools, databases, and methods for efficient resolution of incidents in support of civilian authorities including environmental sampling strategies, fate and transport modeling, clearance levels, and decontamination technologies.

Technical lead for research and development of cyanotoxin drinking water guidelines for the EPA, Office of Water. Assessed cyanotoxin occurrence in surface waters and their association with Harmful Algal Blooms, developed exposure assessment models for risk assessments, and completed exposure and risk assessments to support health advisories and drinking water guidelines.

Technical lead for research and development of health risk screening criteria for radionuclides in fracking waters for the EPA, Office of Water. Developed radionuclide health risk screening tools for evaluation of exposures to radionuclides in fracking water and evaluations of treatment, disposal, or reuse of fracking waters.

Technical lead to the EPA, Office of Water in the assessment of pharmaceuticals and personal care products (PPCPs) as chemicals of emerging concern. This effort developed analytical databases with a key focus on PPCPs in surface waters and drinking water sources. Analyses provided a baseline for the presence of PPCPs in US surface waters and for effectiveness of municipal treatment techniques in removal of PPCPs from drinking water.

Environmental microbiologist responsible for evaluating biopesticide products for the EPA, Office of Pesticide Programs. Tasks included evaluations of biopesticides product chemistry, efficacy, toxicity, non-target organism impacts as well as environmental fate and persistence. Biopesticides also include plant incorporated protection products which are genetically engineered corn, cotton, and soybeans with express insect resistance traits. Responsible for evaluations of transgenic cotton, corn and soybean including; genetic transformations, molecular characterization, efficacy, human health and ecological impacts of transgenic plants, product durability, non-target testing, and insect resistance management plans.

Research Staff, Health Risk Analysis Group
2000 – 2007

PI for Evaluation of Toxicology, Chemistry and Environmental Fate Data on Pesticides, EPA Office of Pesticide Programs. Responsible for development of risk assessment methods and performing chemical pesticide fate and transport analyses and toxicology evaluations for ecological endpoints.

Co-PI in collaboration with the University of Tennessee Food Safety Center of Excellence (UTFSCOE) on a USDA CSREES grant to investigate survivability and transmission of foodborne pathogens in the farm environment for development of pathogen risk assessments. Research provided quantitative microbial risk analysis methodologies to assess adverse impact of pathogens in foods and to enhance safety practices on the farm thus reducing the potential for food borne illness.

Microbiologist evaluating antimicrobial efficacy data for the Antimicrobials Division of EPA's Office of Pesticide Programs. Evaluated the antimicrobial effectiveness of numerous chemicals to pathogenic microorganisms (including fungi, bacteria, and viruses), which humans may contact in air, water, or on inanimate surfaces.

Research Staff, Toxicology and Risk Analysis Section
1996 – 2000

Performed human health, ecological, and radiological risk assessments for the DOE, DoD and other federal agencies; developed risk-based decision analytic methods and software to aid in optimization of site characterization activities and remedial decisions; conducted cost/risk benefit analysis of treatment technologies and developed risk management approaches which address exposure risks and safety risks associated with military unique compounds and unexploded ordnances.

Co-PI for the Decision Support Software Evaluation project sponsored by EPA's Environmental Technology Verification Program, Technology Innovation Office. Designed, developed and implemented a technology evaluation program for testing the capabilities of environmental decision analysis software to perform advanced geostatistics and modeling of cost/risk/benefit factors. Newly developed GIS and visualization software

packages addressed the complex uncertainties associated with natural systems and environmental cleanup decisions. Technology verification reports were produced which documented the performance of the decision support softwares evaluated by the Environmental Technology Verification Program.

As a member of the Consortium for Environmental Risk Evaluation (CERE), provided human health and ecological radionuclide risk metrics for evaluating innovative soil and groundwater treatment technologies for DOE EM. Developed a technology evaluation framework for DOE to assist in selection of applicable treatment technologies and to assist in communicating environmental cleanup decisions to federal and state regulatory agencies as well as the public.

Technical Staff, Risk Analysis Section

1990 – 1996

PI for performance assessment activities for the uranium in soils technology demonstration project for DOE EM, Office of Technology Development. Technical areas included; demonstrations and evaluations of characterization and treatment technologies developed for contaminated soils; the design and application of cost/risk analyses of remediation technologies and systems as well as the quantification of exposures and health risks from contaminated media before, during and after technology implementation. Characterization and treatment technologies were studied at DOE facilities with radionuclide contaminated soils in New Jersey, New Mexico, Tennessee, Ohio and Washington.

Provided risk assessment technical assistance for environmental restoration projects at DOE and DoD sites. As a member of a multidisciplinary project team, provided technical assistance for determining fate and transport of contaminants (primarily radionuclides), estimating exposure and human health risks, and conducting cost/risk analyses of remedial options.

EDUCATION

M.S. Microbiology, University of Georgia, 1989
B.S Biology/Microbiology, Tennessee Technological University, 1986

ADDRESS

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