

Emily A. Caffrey, Ph.D.
President, Radian Scientific, LLC

Education

Ph.D., Radiation Health Physics with minor in Statistics, Oregon State University, 2016
M.S., Radiation Health Physics with minor in Statistics, Oregon State University, 2012
B.S., Nuclear Engineering, Oregon State University, 2010

Professional Experience

Radian Scientific, LLC

President and Owner, Huntsville, Alabama (2016–present)

Health physics consulting with Risk Assessment Corporation (RAC), specializing in radiation dose reconstructions, source term development, atmospheric modeling, environmental assessments, and data management for a wide variety of governmental and industry clients. Successful in passing part 1 of the Certified Health Physics (CHP) Examination.

Oregon State University

Adjunct Faculty, Huntsville, Alabama (2017–present)

Currently redeveloping the External Dosimetry and Shielding course for the online environment. Also creating an online R.O.S.S. (Radiological Operations Support Specialist) course in support of the Departments of Homeland Security (DHS) and Energy (DOE) initiative to train, equip, and certify radiation experts to integrate with the incident command system during a radiological response.

University of Alabama at Birmingham

Adjunct Faculty, Birmingham, Alabama (2016–present)

Currently assisting in the development of a new health physics master's program by developing and teaching core HP curriculum, assisting in the creation of a health physics website, and writing funding grants. Developing research collaboration with Oak Ridge Associated Universities (ORAU).

Courses taught: Introduction to Health Physics, Principles of Dosimetry, Advanced Radiation Biology, Non-ionizing Radiation

Oregon State University School of Nuclear Science and Engineering

Graduate Research Assistant, Corvallis, Oregon (2010–2016)

Performed original research in environmental protection and risk assessment. Completed two projects for the Electrical Power Research Institute, one in examining dose calculation methodologies for Carbon-14 emissions from nuclear power plants and the second in investigating tritium separation technologies for groundwater. Developed substantial analytical and technical skills in statistical analysis and data interpretation through minor degree coursework. Created and taught graduate level course in Liquid Scintillation Counting. Taught introductory course in Nuclear Engineering and Radiation Health Physics. Served as a teaching assistant and lecturer for Radioecology and Radiobiology. Led a multicultural research group of 10 graduate students for over two years.

Australian Nuclear Science and Technology Organization

Endeavor Research Fellow, Sydney, New South Wales, Australia (2015)

Provided innovative computational modeling capabilities to support several research projects. Collected and prepared soil samples for plutonium particle analysis. Performed fieldwork at nuclear waste site near Sydney by obtaining tree cores for radionuclide analysis. Selected to present Ph.D. research to the Australian Radiation Protection and Nuclear Safety Agency.

Oregon State University

Radiation Safety Student Technician, Corvallis, Oregon (2008–2010)

Monitored personnel and laboratories for radiation exposure. Authored operating procedures for the Liquid Scintillation Counter. Managed acquisition, storage, handling, and disposal of radioactive materials. Assisted in performing annual inspections of on-campus radiation use laboratories. Assisted in verifying that veterinary radiography facilities were in compliance with regulatory requirements.

Mathematics Tutor, Corvallis, Oregon (2008)

Tutored small groups of students in advanced algebra and integral calculus.

Honors

Australian Endeavor Research Fellowship Recipient in 2015

Inducted into Alpha Nu Sigma Honor Society in 2013

Selected as an ARCS Scholar in 2012

Affiliations

Health Physics Society Member since 2010

President of the AL Chapter of the Health Physics Society 2017-2018

American Nuclear Society Member since 2006

Alumna of Phi Sigma Rho National Engineering Sorority

Publications

Till, J. E., Beck, H. L., Grogan, H. A., & **Caffrey, E. A.**, 2017. A review of dosimetry used in epidemiological studies considered to evaluate the linear no-threshold (LNT) dose-response model for radiation protection. *International Journal of Radiation Biology*, 93:10:1128–1144.

Caffrey, E.A., Johansen, M.P., Caffrey, J.A., & Higley, K.A., 2017. Comparison of Homogeneous and Particulate Lung Dose Rates for Small Mammals. *Health Physics*. 112:6:526–532.

Caffrey, E.A., 2016. Development and Application of Voxelized Dosimetric Models for Biota: Characterization of the Uncertainty in the International Commission on Radiological Protection's Wildlife Dosimetry System. *Oregon State University Doctoral Dissertation*. Oregon State University. Available at: <http://hdl.handle.net/1957/58187>.

Caffrey E.A., Johansen MP, & Higley KA., 2016. Voxel Modeling of Rabbits for Use in Radiological Dose Rate Calculations. *J Environ Radioact*. 151(ICRER Barcelona 2014):480–6.

Johansen, M. P., Child, D. P., **Caffrey, E. A.**, Davis, E., Harrison, J. J., Hotchkis, M. A. C., & Beresford, N. A., 2016. Accumulation of plutonium in mammalian wildlife tissues following

- dispersal by accidental-release tests. *J Environ Radioact.* 151(ICRER Barcelona 2014):387–94.
- Caffrey E.A.**, Johansen MP, & Higley KA., 2015. Organ Dose Rate Calculations for Small Mammals at Maralinga, the Nevada Test Site, Hanford, and Fukushima: A Comparison of Ellipsoidal and Voxelized Dosimetric Methodologies. *Radiation Research.* 184:433–41.
- Higley, K., Ruedig, E., **Caffrey, E.**, Jia, J., Comolli, M., & Hess, C., 2015. Creation and application of voxelized dosimetric models, and a comparison with the current methodology as used for the International Commission on Radiological Protection’s Reference Animals and Plants. *Annals of the ICRP.* 44:s2.
- Ruedig, E., **Caffrey, E.A.**, Hess, C., & Higley, K.A., 2014. Monte Carlo Derived Absorbed Fractions for a Voxelized Model of *Oncorhynchus Mykiss*, a Rainbow Trout. *Radiation and Environmental Biophysics.* 53:3:581–7.
- Caffrey, E.A.** et al., 2014. Radioecology: Why Bother? *Journal of Environmental Protection.* 5:3.
- Caffrey, E.A.** & Higley, K.A., 2013. Creation of a voxel phantom of the ICRP reference crab. *J Environ Radioact.* 120:14–18.
- Cardarelli, R., Wendland, B., Higley, K.A., Paulenova, A., **Caffrey, E.A.**, Ruirui, L. 2013. Assessment of Tritium Removal Technologies. Electric Power Research Institute Interim Report #3002000608.
- Cardarelli, R., Oliver, G., Hood, D., **Caffrey, E.A.**, Higley, K.A. 2013. Carbon-14 Background, Pathway, and Dose Calculation Analysis for Nuclear Power Plants: A Sourcebook for Accurate Carbon-14 Dose Calculations. Electric Power Research Institute Report #3002000545, Palo Alto, CA.
- Caffrey, E.A.**, 2012. Improvements in the Dosimetric Models of Selected Benthic Organisms. *Oregon State University Master’s Thesis.* Oregon State University. Available at: <http://ir.library.oregonstate.edu/xmlui/handle/1957/34305>.