



EMILY CAFFREY

Oregon State University, College of Engineering, Nuclear Engineering and Radiation Health Physics

Degrees:

M.S. Radiation Health Physics, Oregon State University

B.S. Nuclear Engineering, Oregon State University

Advisor:

Kathryn Higley, Ph.D.

Scholar Award Donor:

Jean and Rick Wills

About the Scholar:

Using data from the former British nuclear weapons testing grounds in Maralinga, Australia, where the chemical form of the plutonium present in the soils is representative of the current global inventory, Emily is investigating the variation in plutonium partitioning in wildlife under actual environmental conditions. A recent study done by her collaborator, Dr. Mathew Johansen of the Australian Nuclear Science and Technology Organization, suggested that plutonium preferentially goes to the skeleton of mammals that live on site, rather than splitting evenly between the liver and the skeleton, as assumed by the International Commission on Radiological Protection. Emily is studying the impacts of this change on radiation dose rates to local wildlife.

Benefits to Society:

The chemical form of the plutonium present in the soils at the Maralinga site is representative of the current global inventory. As such, Emily's research has far reaching effects. Her study will provide new data with regard to radiation doses from plutonium intakes. This data will be widely applicable, with bearings on both environmental system and human worker protections.

Awards and Honors:

Alpha Nu Sigma Honor Society

Publications and Posters:

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*, in press.

Caffrey, E.A. et al., 2014. Radioecology: Why Bother? *Journal of Environmental Protection*, 5(3).

Caffrey, E.A., Higley, K.A. *Carbon-14 Background, Pathway, and Dose Optimization Analysis*. Presentation given at: Health Physics Society 58th Annual Meeting 2013. 7-11 July, Madison, WI.

Caffrey, E.A., Higley, K.A. Improvements in the Dosimetric Models of Selected Benthic Organisms. Presentation given at: Health Physics Society 57th Annual Meeting 2012. 22-26 July, Sacramento, CA.

Caffrey, E.A., Higley, K.A., 2013. Creation of a voxel phantom of the ICRP reference crab. *Journal of Environmental Radioactivity*, 120, pp.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*. *Electric Power Research Institute Report #3002000545*.

Caffrey, E.A., Higley, K.A. *Carbon-14 Background, Pathway, and Dose Optimization Analysis*. Presentation given at: BIOPROTA Carbon-14 Workshop 2013. 12-14 February, Stockholm, Sweden.

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>.