

# Karessa L. Manning

## Environmental Risk Analyst

<https://www.linkedin.com/in/karessa-manning/>



### Summary

Experienced environmental scientist with over a decade of work in chemical and radiological risk modeling, regulatory guidance, and environmental data analysis. Holds an M.S. in Geography with a minor in Computational Science, and a B.S. in Geology and Environmental Studies. Currently supports the EPA Superfund program at Oak Ridge National Laboratory by developing and maintaining mathematical models used to assess human health risks. Combines deep knowledge of environmental policy with advanced programming and analytical skills to inform environmental decision-making and public health protection.

### Skills & Abilities

- Programming: Python, Selenium, R, R Shiny, HTML, LaTeX
- GIS & Visualization: ESRI Tools, QGIS, MathType
- Software/Platforms: Microsoft Office, Adobe, Windows, Linux
- Scientific Expertise: Environmental and Human Health Risk Assessment, Chemical and Radiation Dose/Risk Modeling, Quality Assurance/Control of Interactive Webtool, Data Curation & Analysis

### Experience

#### **Environmental Risk Analyst**

*Oak Ridge National Laboratory (ORNL), Oak Ridge, TN*

Sep 2021 – Present

- Lead quality assurance for 15+ EPA CERCLA- and UCOR-funded risk assessment tools by developing Python/Selenium scripts to automate testing of JavaScript-driven web interfaces and ensure tool functionality.
- Develop and maintain chemical and radiological exposure models evaluating risk across media (soil, water, air, biota), incorporating guidance from EPA, ICRP, and DOE.
- Generate mathematical equation images for documentation using LaTeX, ensuring technical clarity in EPA user guidance.
- Draft technical content in HTML-based user guidance for webtools to ensure regulatory compliance and accessibility.
- Serve as primary contact for ingestion pathway modeling in PRG and DCC tools and manage associated biota exposure datasets.
- Collaborate with EPA sponsors to align model logic, parameter updates, and tool documentation with regulatory guidance.
- Supervise interns and develop training materials for staff and external users.
- Assist with numerous trainings and peer instruction for the Risk Assessment Information System (RAIS) and other EPA environmental risk assessment tools to environmental and human health risk assessors.
- Utilized R to evaluate ecosystem service benefits and economic incentives of cultivating switchgrass and willow for biofuels.
- Integrated spatial data to build an interactive web interface to support decision-making for sustainable bioenergy production.

## **Environmental Risk Analyst**

*University of Tennessee, Knoxville, TN*

Apr 2016 – Sep 2021

- Performed similar duties as at ORNL, contributing to model development and quality assurance for EPA and state environmental risk tools.
- Supported research incorporating national and international chemical and radiological exposure standards into risk models.
- Developed and maintained model documentation and provided peer instruction to environmental and human health risk assessors.

## **Risk Analyst**

*Street Legal Industries, Oak Ridge, TN*

May 2015 – Mar 2016

- Developed and maintained risk and dose equations for environmental exposure models related to public health.
- Collaborated with EPA project sponsors to update guidance language for human health risk assessment tools.
- Improved quality assurance protocols and efficiency for multiple EPA- and UCOR-funded webtools.

## **Risk Assessment Intern**

*Oak Ridge National Laboratory (ORNL), Oak Ridge, TN*

Jun 2013 – May 2015

- Updated Ecological Benchmarks for SADA software and RAIS database.
- Compiled USDA ARS pesticide data for to update RAIS database used in Eco benchmark webtool.
- Followed QA protocols to test webtool accuracy and updated equations and user guides to reflect new exposure guidance.

## **Projects:**

- Risk Assessment Information System (RAIS)
- Regional Screening Levels (RSL)
- Regional Removal Management Levels (RML)
- Vapor Intrusion Screening Levels Calculator (VISL)
- Preliminary Remediation Goals for Radionuclides (PRG)
- Dose Compliance Concentrations for Radionuclides (DCC)
- Radionuclide Vapor Intrusion Screening Levels (RVISL)
- Building PRGs & DCCs (BPRG, BDCC)
- Surface PRGs & DCCs (SPRG, SDCC)
- Superfund Counts Per Minute calculator (CPM)
- State of Alaska Cleanup & Cumulative Risk Tools
- State of Delaware Reporting Levels Calculator
- Bioenergy Valuation of Ecosystem Services Tool (BioVEST)

## **Education**

### **M.S. Geography, Minor in Computational Science**

*University of Tennessee, Knoxville, TN - May 2021*

- Thesis: Association Between Stream Impairment by Mercury and Superfund Sites in the Conterminous USA

### **B.S. Geology & Env. Studies, Minor in Geography**

*University of Tennessee, Knoxville, TN - May 2021*

### **A.S. Geosciences**

*Western Nevada College, Carson City, NV — Dec 2010*

## **Publications & Technical Contributions**

### **Peer-Reviewed Journal Articles**

- Jager HI, Manning KL, et al. (2024). Indicators of thermal alteration in US waters reveal patterns of climate risk at the energy-water nexus. *Ecological Indicators*, 159.

### **Technical Memos (ORNL)**

- Identification and Reclassification of Mutagenic Chemicals for Improved Human Health Screening Levels (2024)
- Air Exchange Rate Impact on Activity Equilibrium Factors and Inhalation Fractional Equilibrium Factors for Rn, Xe, Kr, Ar, Ne, and Their Progeny in Vapor Intrusion, Risk, and Dose Models (2023)
- An Overview of the Risk Assessment Information System (2023)
- Quantifying the Impact of Excluding the Submersion Exposure Route for Existing Superfund Radionuclide Screening Level Calculator Soil and Tap Water Models (2023)
- Biota Modeling in EPA's Preliminary Remediation Goal and Dose Compliance Concentration Calculators: Explanation of Intake Rate Derivation, Transfer Factor Compilation, and Mass Loading Factor Sources (2021)
- Bateman Equation Adaptation for Solving and Integrating Peak Activity into EPA ELCR and Dose Models (2020)
- Air Exchange Rate Impact on Actinon, Thoron, and Radon Activity Equilibrium Factor and Inhalation Fractional Equilibrium Factor Determination in Vapor Intrusion Risk and Dose Models (2020)

### **Conference Presentations and Workshops**

- Society for Risk Analysis (SRA), 2016
  - Poster presentation on biota modeling in EPA calculators.
- Society for Risk Analysis (SRA), 2019
  - Exhibitor for the Risk Assessment Information System (RAIS).
- American Association of Geographers (AAG), 2017–2019
  - Presented thesis research in paper sessions at annual conferences.
- Society of Environmental Toxicology and Chemistry (SETAC), 2024
  - Poster presentation on biota modeling in EPA calculators.

## **Additional Relevant Experience**

### **Soil Science Laboratory Graduate Assistant**

*University of Tennessee, Knoxville, TN*

2013 – 2014

- Measured vapor pressure and CO<sub>2</sub> respiration in soil micro-aggregates.
- Maintained and prepared equipment for field soil sampling campaigns.

### **Laboratory Certification Intern**

*Nevada Division of Environmental Protection, Carson City, NV*

2008 – 2011

- Maintained laboratory certification records under SDWA, CWA, and RCRA regulations.
- Performed detailed data entry and updated watershed sampling maps.
- Supported quality assurance reviews of environmental laboratory procedures.

### **Volunteer Snapshot Day Team Leader**

*Nevada Division of Environmental Protection, Carson City, NV*

2008 – 2011

- Led volunteer teams in water quality sampling and environmental education efforts.
- Calibrated and deployed field equipment; cataloged and interpreted watershed data.
- Delivered outreach presentations to increase public awareness of water quality issues.

### **Volunteer Archaeological Technician**

*U.S. Forest Service, Carson City, NV*

2008 – 2010

- Identified artifacts and updated GIS maps of archaeological field sites.
- Contributed to formal site reports and supported field investigations.
- Assisted in preserving cultural resources through data analysis and documentation.