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**EDUCATION:** Cornell University, Ph.D., Environmental Toxicology, 1993  
Cornell University, M. S., Environmental Toxicology, 1990  
La Salle University, B. A., Biology / English, 1987

**POSITIONS:** Environmental Sciences Division, Oak Ridge National Laboratory (ORNL)  
(1994-present, currently senior scientist)  
American Association for the Advancement of Science Diplomacy Fellow at  
U.S. Agency for International Development (1993-1994)

## CURRENT PROJECTS

- Principal Investigator of “A Framework for Developing Recovery Goals for Species at Risk of Listing on Military Installations,” U.S. Army Corps of Engineers (2006-present)
- Advisor on conceptual models for U.S. Army Corps of Engineers Environmental Benefits Analysis Program (2008)
- Investigator for Environmental Sustainability tasks for Biomass Program, DOE (2008-present)
- Investigator for project “Spatial Modeling of Geographic Patterns in Biodiversity and Biofuel Production” (2008-present), Oak Ridge National Laboratory Laboratory-Directed R&D Fund
- Contributor to white paper on benefits of the East Fork Poplar Creek biological monitoring program on the DOE Oak Ridge Reservation, DOE (2008)
- Consultant to Shaw Environmental, Inc., for screening-level ecological risk assessment at Aerojet Superfund sites in California, USA

## PREVIOUS RESEARCH AND ASSESSMENT EXPERIENCE

- \$ Principal Investigator of “Problem Formulation and Analysis Plan for the Assessment of Potential Human Health Risks posed by Microbial Pathogens in Land-Applied Biosolids,” EPA (2007-2008)
- \$ Investigator for Water Quality Protection Plan for White Oak Creek on the DOE Oak Ridge Reservation, DOE (2008)
- \$ Principal Investigator of ADetermining Relative Value of Ecosystem Services@ (2006-2007), Oak Ridge National Laboratory seed money fund
- \$ Investigator for “Developing Metrics for Assessment of Ecological Benefits of Energy Efficiency and Renewable Energy R&D Programs,” DOE (2007)
- \$ Advisor to DOE and National Wind Coordinating Committee on wildlife risk assessment related to wind energy facilities (2005-2007), DOE
- \$ Risk assessor for regional environmental simulation project implemented for Fort Benning, GA (2001-2007), Department of Defense Strategic Environmental Research and Development Program (SERDP).

- \$ Co-Principal Investigator of project to implement a population model for evaluating risk to sage grouse from habitat disturbance from oil and gas development in northeastern Utah (2004-2006), Bureau of Land Management.
- \$ Principal Investigator of framework for assessment of risks of military testing and training to natural resources, with emphasis on aircraft overflights, artillery, and tracked vehicles. Demonstration at Yuma Proving Ground, Sonoran Desert, AZ (1998-2001, 2005-2006), SERDP.
- \$ Developer/manager of ecological components of TRIM.FaTE, a transport, fate and ecological exposure model for persistent air pollutants (1998-2006), EPA Office of Air Quality Planning and Standards.
- \$ Lead investigator of habitat valuation project for contaminated sites on the Oak Ridge Reservation (2005), Bechtel-Jacobs, LLC.
- \$ Contributor to feasibility study for contaminated pond restoration (2005), Bechtel-Jacobs, LLC.
- \$ Principal Investigator of project to develop tools for terrestrial ecological risk assessment at petroleum refinery, pipeline or landfarm sites (2000-2004), U. S. Department of Energy (DOE).
- \$ Developer of framework for Net Environmental Benefit Analysis for petroleum-contaminated sites (2000-2004), DOE
- \$ Co-Principal Investigator of project to develop spatial assessment methods and population models for evaluating risk to wildlife and vegetation at petroleum exploration & production sites (2000-2004), DOE.
- \$ Ecological risk assessor for project on integrated risk assessment for alternative wastewater systems (2003-2004), U.S. Environmental Protection Agency (EPA).
- \$ Principal Investigator for evaluation of ecological risks associated with the land application of municipal sewage sludge in semi-arid rangeland, Douglas-fir forest, loblolly pine plantations, and eastern deciduous forest ecosystems (1995-1998), EPA Office of Research and Development.
- \$ Ecological Risk Assessment Team Leader and contributor to several risk assessments for contaminated Oak Ridge facilities (1995-1998), DOE.
- \$ Developer of regression models for the uptake of contaminants by plants and soil invertebrates (1997-1998), DOE.
- \$ Developer of benchmarks for toxicity of plants and soil invertebrates to chemicals in soil (1996-1997), DOE.
- \$ Contributor to ecological risk assessment for Anniston, AL, Chemical Agent Disposal Facility (1997).
- \$ Participant in comparative risk assessment in Cairo, Egypt and pollution prevention programs in developing countries as an American Association for the Advancement of Science Diplomacy Fellow at the U. S. Agency for International Development (1993-1994).
- \$ Graduate research assistant investigating the role of nonaqueous phase liquids in the microbial biodegradation of organic chemicals, Cornell University (1992-1993).

**HONORS AND OFFICES:** Army Corps of Engineers Waterways Experiment Station Environmental Benefits Analysis Conceptual Model Working Group (2008), Asheville Sustainability Center Senior Advisor for Water Quality (2008), Editorial board of *Human and Ecological Risk Assessment* (2005-present); editorial board of *Environmental Toxicology and Chemistry* (2003-present); Society of Environmental Toxicology and Chemistry (SETAC) North America Technical Committee (2004-present); Reviewer for U.S. Army Corps of Engineers proposals (2008); Reviewer for EPA Stressor Identification Guidance (CADDIS) case studies (2008); National Wind Coordinating Committee Wildlife Working Group and Risk Assessment Subgroup (2004-2007); SETAC Contaminated Soils Advisory Group (1999-present); Invited participant in EPA Ecorisk Workshop for Air Toxics (2006); reviewer of Ecological Society of America SEEDS fellowship applications (2005); member of interagency group on assessing the value of environmental services (2004-2005); Oak Ridge National Laboratory

Environmental Sciences Division Distinguished Scientific Achievement Award (2002); consultant to Surface Impoundments Study Subcommittee of EPA Science Advisory Board's Environmental Engineering Committee (2001-2002); peer review panel for EPA Ecological Soil Screening Levels; peer review panel for EPA STAR wildlife toxicology proposals (2001); Leslie Garrett Award for Fiction (1999); invited participant in SETAC Pellston workshop on contaminated soils (1998); consultant to EPA Science Advisory Board Air Toxics Monitoring Subcommittee; former member of NSF/EPA Water and Watersheds Peer Review Panel; former member of City of Oak Ridge Environmental Quality Advisory Board (1998-2000); participant in EPA Eco Risk Teleconference on Assessment Endpoints & Measures of Effects; reviewer for *Environmental Science & Technology*, *Environmental Management*, *Journal of Environmental Quality*, *Risk Analysis*, *Ecotoxicology*, *Human and Ecological Risk Assessment*, *Science of the Total Environment*, *Ecological Indicators*, *Journal of Environmental Management*, *Ecological Modelling*; have reviewed reports for the U.S. Army Corps of Engineers, EPA, the University of Toronto Geography Department, Toronto Public Health Department, Illinois Waste Management and Research Center, Ohio EPA, and the Province of British Columbia; AAAS Science, Engineering, and Diplomacy Fellow; National Science Foundation Graduate Fellowship awardee; Cornell University Olin and A. D. White graduate fellowships awardee.

## BOOK

Suter, G. W. II, R. A. Efroymson, B. E. Sample and D. S. Jones. 2000. *Ecological Risk Assessment for Contaminated Sites*. CRC/Lewis Press, Boca Raton, FL.

## PEER-REVIEWED PUBLICATIONS

- Efroymson, R.A., H.I. Jager, and W.W. Hargrove. Invited and submitted. Valuing wildlands. In *Environmental Risk Assessment and Management from a Landscape Perspective*. L. Kapustka, W. Landis, and A. Johnson (eds.). John Wiley & Sons, New York.
- Jager, H. I., R. A. Efroymson, L. M. Baskaran, and B. D. Maxfield. Submitted. Model-based evaluation of extinction thresholds for a social species, the greater sage grouse (*Centrocercus urophasianus*). *Ecol. Modelling*.
- Efroymson, R. A., M. J. Peterson, D. S. Jones, and G. W. Suter II. In press 2008. The Apache Longbow-Hellfire Missile Test at Yuma Proving ground: Introduction and problem formulation for a multiple stressor risk assessment. *Hum. Ecol. Risk Assess.*14:854-870.
- Efroymson, R. A., W. W. Hargrove, and G. W. Suter II. In press 2008. The Apache Longbow-Hellfire Missile Test at Yuma Proving Ground: Ecological risk assessment for helicopter overflight. *Hum. Ecol. Risk Assess.*14:871-897.
- Jones, D. S., R. A. Efroymson, W. W. Hargrove, G. W. Suter II, and L. L. Pater. In press 2008. The Apache Longbow-Hellfire Missile Test at Yuma Proving Ground: Ecological risk assessment for missile firing. *Hum. Ecol. Risk Assess.*14:898-918.
- Peterson, M. J., W. W. Hargrove, and R. A. Efroymson. In press 2008. The Apache Longbow-Hellfire missile test at Yuma Proving Ground: Ecological risk assessment for tracked vehicle movement across desert pavement. *Hum. Ecol. Risk Assess.*14:919-946.
- Efroymson, R. A., V. A. Morrill, V. H. Dale, T. F. Jenkins, and N. R. Giffen. In press. Publication date April 2009. Habitat disturbance at explosives-contaminated ranges. In Sunahara, G., J. Hawari, G. Lotufo, and R. Kuperman (eds.) *Ecotoxicology of Explosives and Unexploded Ordnance*, CRC Press, Boca Raton, FL.
- Dale, V.H., F. Akhtar, M. Aldridge, L. Baskaran, M. Berry, M. Browne, M. Chang, R. Efroymson, C. Garten, Jr., E. Lingerfelt, C. Stewart. 2008. Modeling the effects of land use on the quality of water, air, noise, and habitat for a five-county region in Georgia. *Ecology and Society* 13(1):10. [online] URL: <http://www.ecologyandsociety.org/vol13/iss1/art10/>

- Efroymson, R. A., M. J. Peterson, C. J. Welsh, D. L. Druckenbrod, M. G. Ryon, J. G. Smith, W. W. Hargrove, N. R. Giffen, W. K. Roy, and H. D. Quarles. 2008. Investigating habitat value to inform contaminant remediation options: Approach. *J. Environ. Manage.* 88:1436-1451.
- Efroymson, R. A., M. J. Peterson, N. R. Giffen, M. G. Ryon, J. G. Smith, W. K. Roy, W. W. Hargrove, C. J. Welsh, D. L. Druckenbrod, and H. D. Quarles. 2008. Investigating habitat value to inform contaminant remediation options: Case study. *J. Environ. Manage.* 88:1452-1470.
- Efroymson, R. A., D. S. Jones, and A. J. Gold. 2007. An ecological risk assessment framework for effects of onsite wastewater treatment systems and other localized sources of nutrients on aquatic ecosystems. *Human and Ecological Risk Assessment* 13:574-614.
- Baskaran, L. M., V. H. Dale, R. A. Efroymson, and W. Birkhead. 2006. Habitat modeling within a regional context. An example using Gopher Tortoise. *Amer. Midl. Nat.* 155:335-351.
- Washington-Allen, R. A., N. E. West, R. D. Ramsey and R. A. Efroymson. 2006. A protocol for retrospective remote sensing-based ecological monitoring of rangelands. *Range Ecol. Manage.* 59:19-29.
- Jager, H. I., E. A. Carr, and R. A. Efroymson. 2006. Simulated effects of habitat loss and fragmentation on a solitary mustelid predator. *Ecological Modelling* 191:416-430.
- Dale, V., M. Aldridge, T. Arthur, L. Baskaran, M. Berry, M. Chang, R. Efroymson, C. Garten, C. Stewart, and R. Washington-Allen. 2006. Bioregional planning in Central Georgia. *Futures* 38:471-489.
- Efroymson, R. A., V. H. Dale, L. M. Baskaran, M. Chang, M. Aldridge, and M. Berry. 2005. Planning transboundary ecological risk assessments at military installations. *Hum. Ecol. Risk Assess.* 11:1193-1215.
- Hargrove, W. W., F. M. Hoffman, and R. A. Efroymson. 2005. A practical map-analysis tool for detecting dispersal corridors. *Landscape Ecology* 20:361-373.
- Jager, H. I., R. A. Efroymson, K. Sublette, and T. L. Ashwood. 2005. Unnatural landscapes in ecology: generating the spatial distribution of brine spills. *Environmetrics* 16:687-698.
- Dale, V., D. Druckenbrod, L. Baskaran, M. Aldridge, M. Berry, C. Garten, L. Olsen, R. Efroymson, and R. Washington-Allen. 2005. Vehicle impacts on the environment at different spatial scales: Observations in west central Georgia, USA. *Journal of Terramechanics*.42:383-402
- Efroymson, R. A., B. E. Sample, and G. W. Suter II. 2004. Bioaccumulation of inorganic chemicals from soil by plants: spiked soils versus field contamination or background. *Hum. Ecol. Risk Assess.* 10:1117-1127.
- Efroymson, R. A., J. P. Nicolette, and G. W. Suter II. 2004. A framework for Net Environmental Benefit Analysis for remediation or restoration of contaminated sites. *Environ. Manage.* 34:315-331.
- Efroymson, R. A., Carlsen, T. M., Jager, H. I., Kostova, T., Carr, E. A., Hargrove, W. W., Kercher, J., and Ashwood, T. L. 2004. Toward a Framework for assessing risk to vertebrate populations from brine and petroleum spills at exploration and production sites, pp. 261-285 in *Landscape Ecology and Wildlife Habitat Evaluation: Critical Information for Ecological Risk Assessment, Land-Use Management Activities, and Biodiversity Enhancement Practices*, ASTM STP 1458, L. Kapustka, H. Galbraith, M. Luxon, and G. R. Biddinger (eds.), ASTM International, West Conshohocken, PA.
- Efroymson, R. A., B. E. Sample, and M. J. Peterson. 2004. Ecotoxicity test data for total petroleum hydrocarbons in soil: plants and soil-dwelling invertebrates. *Hum. Ecol. Risk Assess.* 10:207-31.
- Menzie, C. A., R. A. Efroymson, S. J. Ells, G. M. Henningsen, and B K. Hope. 2003. Risk assessment and risk management. Pp. 11-72 In Lanno, RP (ed.), *Contaminated Soils: From Soil-Contaminant Interactions to Ecosystem Management*, SETAC Press, Pensacola, FL.
- Efroymson, R. A., B. E. Sample, and G. W. Suter II. 2001. Bioaccumulation of inorganic chemicals from soil by plants: regressions of field data. *Environ. Toxicol. Chem.* 20:2561-2571.

- Efroymson, R. A., and D. L. Murphy. 2001. Ecological risk assessment of multimedia hazardous air pollutants: estimating exposure and effects. *Sci. Total Environment* 274:219-230.
- Efroymson, R. A., G. W. Suter II, W. H. Rose, and S. Nemeth. 2001. Ecological risk assessment framework for low-altitude aircraft overflights: I. Planning the analysis and estimating exposure. *Risk Analysis* 21:251-262.
- Efroymson, R. A., and G. W. Suter II. 2001. Ecological risk assessment framework for low-altitude aircraft overflights: II. Estimating effects on wildlife. *Risk Analysis* 21:263-274.
- Efroymson, R. A., B. E. Sample, R. J. Luxmoore, L. W. Barnthouse, and F. B. Daniel. 2000. Ecological risk assessment methods for biosolids application in forests. In C. L. Henry, R. B. Harrison, and R. K. Bastian, eds. *The Forest Alternative: Principles and Practice of Residuals Use*. College of Forest Resources, University of Washington, Seattle, WA. [note: extended abstract mistakenly included in first printing of book, pp. 45-48, but full article added to CD-ROM by Rob Harrison]
- Efroymson, R. A., and G. W. Suter II. 1999. Finding a niche for soil microbial toxicity tests in ecological risk assessment. *Hum. and Ecol. Risk Assess.* 5:715-727.
- Efroymson, R. A. 1999. Regulating risk: Oversight of microbial products of biotechnology under the Toxic Substances Control Act. *Journal of Environmental Assessment Policy and Management* 1:329-347.
- Luxmoore, R. J., M. L. Tharp, and R. A. Efroymson. 1999. Comparison of simulated forest responses to biosolids applications. *J. Environ. Qual.* 28:1996-2007.
- Suter, G. W. II, L. W. Barnthouse, R. A. Efroymson, and H. Jager. 1999. Ecological risk assessment in a large river-reservoir. 2. Fish community. *Environ. Toxicol. Chem.* 18:589-598.
- Jones, D. S., L. W. Barnthouse, G. W. Suter II, R. A. Efroymson, J. M. Field, and J. J. Beauchamp. 1999. Ecological risk assessment in a large river-reservoir. 3. Benthic invertebrates. *Environ. Toxicol. Chem.* 18:599-609.
- Sample, B. E., G. W. Suter II, J. J. Beauchamp, and R. A. Efroymson. 1999. Literature-derived bioaccumulation models for earthworms: development and validation. *Environ. Toxicol. Chem.* 18:2110-2120.
- Suter, G. W. II., and R. A. Efroymson. 1997. Controversies in ecological risk assessment: assessment scientists respond. *Environ. Manage.* 21:819-822.
- O'Neill, R. V., J. R. Kahn, J. R. Duncan, S. Elliott, R. Efroymson, H. Cardwell, and D. W. Jones. 1996. Economic growth and sustainability: a new challenge. *Ecological Applications* 6:23-24.
- Efroymson, R. A., and M. Alexander. 1995. Reduced mineralization of low concentrations of phenanthrene because of sequestering in nonaqueous phase liquids (NAPLs). *Environ. Sci. Technol.* 29:515-521.
- Efroymson, R. A., and M. Alexander. 1994. Role of partitioning in biodegradation of phenanthrene dissolved in nonaqueous-phase liquids. *Environ. Sci. Technol.* 28:1172-1179.
- Efroymson, R. A., and M. Alexander. 1994. Biodegradation in soil of hydrophobic pollutants in nonaqueous phase liquids (NAPLs). *Environ. Toxicol. Chem.* 13:405-411.
- Efroymson, R. A., and M. Alexander. 1991. Biodegradation by an *Arthrobacter* species of hydrocarbons partitioned into an organic solvent. *Appl. Environ. Microbiol.* 57:1441-1447.
- Pimentel, D., M. S. Hunter, J. A. LaGro, R. A. Efroymson, J. C. Landers, F. T. Mervis, C. A. McCarthy, and A. E. Boyd. 1989. Benefits and risks of genetic engineering in agriculture. *BioScience* 39:606-614.

## REPORTS AND NON-PEER-REVIEWED ARTICLES

- Some of these reports are available at <http://www.esd.ornl.gov/programs/ecorisk/ecorisk.html>
- Casper, A. F., R. A. Efroymson, S. M. Davis, G. Steyer, and B. Zettle. 2008. Using conceptual models in ecosystem restoration planning and environmental benefits analysis. ERDC TN-EMRRP-??-x.

- U.S. Army Corps of Engineers, Vicksburg, MS.
- Efroymson, R. A., and A. Armstrong. 2008 in review. Problem Formulation for Human Health Risk Assessments of Pathogens in Land-Applied Biosolids. NCE-C-2078. National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH, USA.
- Efroymson, R. 2008. Part-time at a National Laboratory: A split life. In E. Monosson, ed. *Motherhood: The Elephant in the Laboratory*. Cornell University Press, Ithaca, NY.
- Efroymson, R. A., M. J. Peterson, N. R. Giffen, M. G. Ryon, J. G. Smith, W. K. Roy, C. J. Welsh, D. L. Druckenbrod, W. W. Hargrove, and H. D. Quarles. 2005. Investigating Habitat Value in Support of Remedial Decisions: A Case Study of Six Sites at the East Tennessee Technology Park. BJC/OR-2268. Bechtel Jacobs Company, Oak Ridge, TN.
- Peterson, M.J., R. A. Efroymson, M. G. Ryon, J. G. Smith, G. R. Southworth, A. J. Stewart. 2005. Evaluation of the Ecological Management and Enhancement Alternative for Remediation of the K-007-P1 Pond. ORNL/TM-2005/172. Oak Ridge National Laboratory, Oak Ridge, TN.
- Lee, M., D. Burch, M. E. McVey, R. Murphy, B. Jones, R. Maddalena, D. H. Bennett, T. E. McKone, R. A. Efroymson, B. F. Lyon, D. S. Jones, A. Eyth. 2005. Evaluation of TRIM.FaTE. Volume II: Model Performance Focusing on Mercury Test Case. EPA-453/R-05-002. U. S. Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC. [http://www.epa.gov/ttn/fera/trim\\_fate.html](http://www.epa.gov/ttn/fera/trim_fate.html)
- Efroymson, R.A. 2004. Net environmental benefit analysis. Letter to *Science* 306:976.
- Jones, D. S., R. A. Efroymson, A. Q. Armstrong, M. D. Muhlheim, and S. A. Carnes. 2004. *Integrated Risk Assessment for Individual Onsite Wastewater Systems*, ERD-00-1815, Washington University, St. Louis.
- Dale, V.H., D. Druckenbrod, L. Baskaran, C. Garten, L. Olsen, R. Efroymson, and R. Washington-Allen, M. Aldridge, M. Berry. In press. Analyzing Land-Use Change at Different Scales in Central Georgia. Proceedings of the 4th Southern Forestry and Natural Resource GIS Conference. Athens, Georgia, Dec 16-18, 2004.
- Efroymson, R. A., J. P. Nicolette, and G. W. Suter II. 2003. *A Framework for Net Environmental Benefit Analysis for Remediation or Restoration of Petroleum-Contaminated Sites*. ORNL/TM-2003/17. Oak Ridge National Laboratory, Oak Ridge, TN.
- Maddalena, R., D. H. Bennett, T. E. McKone, B. F. Lyon, R. A. Efroymson, D. S. Jones, A. Eyth, M. Lee, M. E. McVey, D. Burch, J. Cleland, and B. Jones. 2002. Evaluation of TRIM.FaTE. Volume 1: Approach and Initial Findings. EPA-453/R-02-012. U. S. Environmental Protection Agency Office of Air Quality Planning and Standards. Research Triangle Park, NC.
- U. S. Environmental Protection Agency. 2002. Total Risk Integrated Methodology. TRIM.FaTE Technical Support Document. Vol. I: Description of Module. EPA-453/R-02-011a. EPA Office of Air Quality Planning and Standards. Research Triangle Park, NC. (Contributor)
- U. S. Environmental Protection Agency. 2002. Total Risk Integrated Methodology. TRIM.FaTE Technical Support Document. Vol. II: Description of Chemical Transport and Transformation Algorithms. EPA-453/R-02-011b. EPA Office of Air Quality Planning and Standards. Research Triangle Park, NC. (Contributor)
- Efroymson, R. A., W. W. Hargrove, M. J. Peterson, D. S. Jones, W. H. Rose, L. Pater, K. Reinbold, and G. W. Suter II. 2001. *Demonstration of the Military Ecological Risk Assessment Framework (MERAf): Apache-Longbow/BHellfire Missile Test at Yuma Proving Ground*. ORNL/TM-2001/211. Oak Ridge National Laboratory, Oak Ridge, TN.
- Carlsen, T., and R. A. Efroymson. 2001. Current directions in screening-level ecological risk assessments. Symposium paper. SPE/EPA/DOE Exploration and Production Environmental Conference. San Antonio, TX, February 26-28, 2001. Society of Petroleum Engineers, Dallas, TX.

- Hall, C., L. Neher, L. Wilder, T. Carlsen, T. Ashwood, R. Washington-Allen, and R. Efroymson. 2001. *Data Collection Protocol for Developing Geographic Information Systems to Investigate and Manage Ecological Impacts at Petroleum Exploration and Production Sites*. UCRL-ID-142371. Lawrence Livermore National Laboratory, Livermore, CA.
- Efroymson, R. A., W. H. Rose, S. Nemeth, G. W. Suter II. 2000. *Ecological Risk Assessment Framework For Low-altitude Overflights by Fixed-wing and Rotary-wing Military Aircraft*. ORNL/TM-2000/289. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Efroymson, R. A. 2000. Book review of [*Should We Risk It? Exploring Environmental, Health and Technological Problem Solving*, by D. M. Kammen and D. M. Hassenzahl. Princeton University Press, 1999] *Endeavour* 24(1)46-47.
- Efroymson, R. A., B. E. Sample, R. J. Luxmoore, M. L. Tharp, and L. W. Barnthouse. 1998. *Evaluation of the Ecological Risks Associated with Land Application of Municipal Sewage Sludge. Final Report*. ORNL-TM-13703. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Bechtel Jacobs Company (R. Efroymson primary author). 1998. *Empirical Models for the Uptake of Inorganic Chemicals from Soil by Plants*. BJC/OR-133. U. S. Department of Energy, Oak Ridge, TN.
- Suter, G. W. II. R. A. Efroymson, B. E. Sample, D. S. Jones. 1998. Reliability versus relevance of ecotoxicological benchmarks. *SETAC News* 18(4):16-18.
- U. S. Environmental Protection Agency. 1999. *TRIM. Total Risk Integrated Methodology. Status Report*. EPA-453/R-99-010. EPA Office of Air Quality Planning & Standards, Research Triangle Park, NC. (contributor)
- U. S. Environmental Protection Agency. 1998. *TRIM. Total Risk Integrated Methodology. TRIM.FaTE Technical Support Document. Volume I: Description of Module. Volume II: Description of Chemical Transport and Transformation Algorithms*. EPA-453/D-99-002A and B. EPA Office of Air Quality Planning & Standards, Research Triangle Park, NC. (contributor)
- Sample, B. E., G. W. Suter II, R. A. Efroymson, and D. S. Jones. 1998. *A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application*. ORNL/TM-13615. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Efroymson, R. A., M. E. Will, and G. W. Suter II. 1997. *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision*, ES/ER/TM-126/R2. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Efroymson, R. A., M. E. Will, G. W. Suter II and A. C. Wooten. 1997. *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision*, ES/ER/TM-85/R3. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Sample, B. E., J. J. Beauchamp, R. Efroymson, G. W. Suter II, and T. L. Ashwood. 1998. *Development and Validation of Literature-based bioaccumulation models for earthworms*. ES/ER/TM-220. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Sample, B. E., J. J. Beauchamp, R. Efroymson, G. W. Suter II, and T. L. Ashwood. 1998. *Development and validation of bioaccumulation models for small mammals*. ES/ER/TM-219. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Energy Systems Environmental Restoration Program (Efroymson, R. A. primary author of ecological risk assessment). 1997. *Remedial Investigation for the K-1070-A Burial Ground at the Oak Ridge K-25 Site, Oak Ridge, Tennessee. Chapter 6, Volume I. Ecological Risk Assessment*. DOE/OR/01-1519.
- Energy Systems Environmental Restoration Program. 1997. *Report on the Remedial Investigation of Upper East Fork Poplar Creek Characterization Area at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee. Volume 6. Appendix G-Baseline Ecological Risk Assessment Report*. DOE/OR/01-1641.

- Efroymson, R. A. 1997. Environmental cost of development. Book review of *Mortgaging the Earth: the World Bank, Environmental Impoverishment, and the Crisis of Development*, by Bruce Rich (Boston: Beacon Press, 1994). *Forum for Applied Research and Public Policy* 12(3):153.
- Efroymson, R. A. 1997. Book review of *Linking Science and Technology to Society's Environmental Goals*, by Policy Division, National Research Council (Washington, D. C.: National Academy Press, 1996) *SETAC News* 17(4):15.
- Sample, B. E., M. S. Aplin, R. A. Efroymson, G. W. Suter II, C. J. E. Welsh. 1997. *Methods and Tools for Estimation for the Exposure of Terrestrial Wildlife to Contaminants*. ORNL/TM-13391. Oak Ridge National Laboratory, Oak Ridge, TN. (prepared for DOE Office of Environmental Policy and Assistance, Air, Water, and Radiation Division)
- Efroymson, R. A., G. W. Suter II, B. E. Sample, and D. S. Jones. 1996. *Preliminary Remediation Goals for Ecological Endpoints*. ES/ER/TM-162/R1. Oak Ridge National Laboratory, Oak Ridge, TN.
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