

CURRICULUM VITAE
Steven Thomas Purucker

Address

Work: Ecology & Evolutionary Biology
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Education

B.A., 1991. University of Tennessee, Zoology & Anthropology.

Ph.D., anticipated Summer 2006. University of Tennessee, Ecology and Evolutionary Biology
Dissertation: "Spatially Explicit Modeling of Environmental Risk Assessment Processes", Advisor: Dr. Tom Hallam

Professional

1992- present: Sr. Research Associate, The Institute for Environmental Modeling, U. Tennessee

I have worked in The Institute for Environmental Modeling at the University of Tennessee developing code for environmental assessment software programs and performing quantitative ecological and human health risk assessments. Particular areas of interest include spatial statistical applications to environmental contamination problems, exposure assessment development, fate and transport of contaminants, ecological population models, and applications of uncertainty analysis to these areas in a decision-making context. In addition to programming and performing hazardous waste risk assessments, I have experience in technical oversight and support, policy development, and scheduling and planning of assessment activities.

I am a co-developer and co-principal investigator for the Spatial Analysis and Decision Assistance (SADA) freeware that has been downloaded over 15000 times from the website at <http://www.tiem.utk.edu/~sada/>. I develop and maintain a dynamic link library of over 150000 lines of code consisting of algorithms for statistical, ecological, and human health risk assessment capabilities that work in a spatial GIS context. This library is used in SADA and has also been used in the FIELDS ArcGIS add-in software produced by EPA Region 5. In addition to coding, I am active in all areas of software project development for SADA; including software design, creating and maintaining the web page, documentation and help file development, procurement of funding, software verification and validation, distribution testing, and conducting multi-day software training sessions.

My research interests lie in the importance of space in environmental risk assessment processes. I am interested in creating methods and tools that assist in the explicit consideration in space for the environmental assessments of risk in a variety of applications. Consideration of space and use of these tools in the assessment process have the potential to improve the estimates of the risk outcomes and therefore can influence the resulting risk management decisions. These improved risk estimates can then be used in optimally designing the risk management decisions that are ultimately implemented.

Symposia/Presentations/Posters

- Society for Environmental Toxicity and Chemistry; Baltimore, Maryland 2005. Purucker, S.T., R.N. Stewart, and C.J.E. Welsh. *Use of habitat-contamination spatial correlation to determine when to perform a spatially explicit ecological risk assessment.* (talk)
- Ecological Society of America, Montreal, Canada 2005. Purucker, S.T., R.N. Stewart, C.J.E. Welsh. *SADA: Freeware for GIS and Ecological Risk Assessment in the Classroom.* (poster)
- North American Symposium for Bat Research; Salt Lake City, Utah, 2004. Purucker, S.T. and T.G. Hallam. *Ecological Interactions between the Mexican Free-tailed Bat and the European Corn Borer: A Model for the Effects of Bt Crops on Bats and Insect Resistance Dynamics.* (poster).
- Geostatistical Analysis of Health and Exposure Conference, Ann Arbor, Michigan, 2004. Purucker, S.T. *Characterizing Risk in SADA.* (talk)
- The International Environmental Society/Spatial Accuracy Symposium; Portland, Maine, 2004. Purucker, S.T., R.N. Stewart, C.J.E. Welsh. *Spatially Explicit Ecological Risk Assessment and Foraging Models.* (talk)
- Society for Risk Analysis, World Congress on Risk, Brussels; Belgium, 2003. M. Clauberg, F. Dolislager, L. Galloway, T. Purucker, J.J. Roberts-Niemann, R. Stewart, and D. Thomas. *Online Tools for Risk Assessment* (workshop).
- Society for Risk Analysis, World Congress on Risk; Brussels, Belgium, 2003. Purucker, S.T. *Spatial Methods for Environmental Sampling, Risk Characterization, and Management.* (talk and session organizer).
- Society for Risk Analysis, World Congress on Risk; Brussels, Belgium, 2003. Purucker, S.T., R.N. Stewart, C.J.E. Welsh. *SADA: Freeware for Integrating Ecological and Human Health Risk Assessment with Geostatistics.* (poster)
- FIELDS/SADA Conference; Chicago, Illinois, 2003. S.T. Purucker. *Overview of SADA Software and Risk Assessment.* (talk)
- Society for Risk Analysis; Baltimore, Maryland, 2003. Purucker, S.T., R.N. Stewart, and C.J.E. Welsh. *Secondary Sample Designs for Risk Assessment.* (poster)
- Society for Risk Analysis; New Orleans, Louisiana, 2002. S.T. Purucker and R.N. Stewart. *SADA: Freeware To Assist in Integrating Ecological and Human Health Risk Assessment With Geostatistical Analyses.* (poster)
- Tennessee Solid/Hazardous Waste Conference & Exhibition Gatlinburg, TN, 2002. P. Mulligan and S.T. Purucker. *Consistency and Efficiency in Risk Assessment using Spatial Analysis and Decision Assessment (SADA) Software* (talk)
- Fifth Course on Mathematical Ecology Conference; Trieste, Italy, 2000. Purucker, S.T. *Practical Ecological Hazard and Risk Assessment.* (talk).
- RCRA: Visions for the Future. Environmental Protection Agency National RCRA Program Meeting. Washington, DC, 2000. S.T. Purucker. *Human Health and Ecological Risk Assessment using SADA.* (talk)
- Ecological Society of America; Spokane, Washington, 1999. Purucker, S.T. *Dose Rate Variability from Chronic Sr-90 Exposures to White-tailed Deer (*Odocoileus virginianus*) in Melton Valley, Tennessee.* (talk)
- Cost efficient acquisition and utilization of data in the management of hazardous waste sites;

Herndon, VA 1994. S.T. Purucker. *Decision Analysis Application and the CERCLA Process*. (talk)

Memberships

American Association for the Advancement of Science
 American Institute of Biological Sciences
 Association for Environmental Health and Sciences
 Ecological Society of America
 Society for Environmental Toxicity and Chemistry
 Society for Risk Analysis

Grants/Contracts

US Nuclear Regulatory Commission, Sparse Radiological Data Subsurface Survey Data Analysis (R01-1086-136), \$980K, 3/06-11/08 (co-PI).
 Swedish EPA/Swedish Geotechnical Institute, Spatial Risk Considerations, \$10K, 10/05-1/06 (participant)
 Navy/TetraTech, US Naval Facilities Engineering Command (NAVFAC) SADA Applications Workshop (R01-1086-115), \$10K, 4/05-8/05 (co-PI)
 US Environmental Protection Agency, National Center for Environmental Research, Ecological Risks and Controls for the Plant-Incorporated Protectant (*Bacillus thuringiensis*) in an Insectivory Food Web, \$750K, 10/04-9/07 (participant).
 US Department of Transportation/Research and Special Program Administration/Volpe Center, EPA Region 5 FIELDS Technical Support (R01-1086-111), \$50K, 10/04-4/05 (co-PI)
 US Department of Transportation/ Research and Special Program Administration /Volpe Center, EPA Region 5 FIELDS Technical Support (R01-1086-090), \$50K, 1/04-7/04 (co-PI)
 US Nuclear Regulatory Commission, Bayesian Subsurface Radiological Surveying and Analysis (R01-1086-049), \$930K, 9/03-10/05 (co-PI)
 US EPA Region 5 Superfund Division Innovative Technology Evaluation (R01-3515-066), \$200K, 10/02-7/03 (co-PI)
 US EPA Region 5 Superfund Division Innovative Technology Evaluation (R01-3515-066), \$200K, 10/01-9/02 (co-PI)
 US EPA Region 5 Superfund Division Innovative Technology Evaluation (R01-3515-066), \$100K, 4/01-9/01 (co-PI)
 US EPA Region 5 Water Division, SADA/FIELDS Technology Development (R01-3515-066), \$65K, 9/00-2/01 (co-PI)
 US EPA Region 5 Water Division, SADA/FIELDS Technology Development (R01-3515-066), \$50K, 7/00-12/00 (co-PI)
 US EPA R5 Water Division, SADA/FIELDS Technology Development (R01-3515-066), \$70K, 2/00-9/00 (co-PI)
 US EPA Office of Research and Development National Center for Environmental Research and Quality Assurance, SADA/FIELDS Development- Technology Innovation Office, \$50K, 10/99-7/00 (co-PI)
 US DOE, Various Contracts to support risk assessment activities at the Oak Ridge Reservation, ~\$750K, 10/93-9/99

Software Training Workshops Conducted

University of Tennessee SADA Training, Knoxville, Tennessee, 5-7 October 2005.
Swedish Geotechnical Institute Training, Goteborg, Sweden, 12-15 September 2005.
US Nuclear Regulatory Commission SADA Training, Rockville, MD, 12-14 April 2005.
US Naval Facilities Engineering Command (NAVFAC) SADA Workshop, Philadelphia, Pennsylvania, 2-3 August 2005.
University of Tennessee SADA Training, Knoxville, Tennessee, 23-25 February 2005.
Petróleo Brasileiro SA (Petrobras), Rio de Janeiro, Brazil, 16-20 Aug 2004.
NRC SADA Workshop, Rockville, MD, 4-5 May 2004.
Society for Risk Analysis- World Congress on Risk, Brussels, Belgium, 22 June 2003.
FIELDS/SADA 2003 Training Conference in Chicago, 5-7 March 2003.
Illinois Natural History Survey/ Department of Natural Resources. EPA Region 5, Champaign, IL, 21 May 2002.
EPA Ecological Risk Assessment Forum, National Conservation Training Center, Shepherdstown, West Virginia, 9 January 2002.
EPA Region 9, San Francisco, California, 28-29 August 2001.
EPA Region 5, Chicago, Illinois, 16-17 July 2001.
2001 Fields with SADA Conference EPA Region 6, Denver, Colorado, 6-8 March 2001.
Fifth Course on Mathematical Ecology Conference Trieste, Italy, 28 February - 24 March 2000.

Teaching Experience

University of Tennessee preparatory course for advanced high school students. Annual week-long summer course in a computer laboratory that reviews environmental computer models and their applications. I created course and all course materials.
University of Tennessee, Mathematical Ecology 681 co-taught with Tom Hallam
Occasional guest lectures on applications of spatial statistics and ecological risk assessment for various Ecology and Evolutionary Biology for courses taught by Tom Hallam.

Journal Reviews

Biological Invasions
Human and Ecological Risk Assessment
Journal of Soil & Sediment Contamination
Proceedings of the National Academy of Sciences
Risk Analysis

Technical Skills

Operating Systems: Windows XP, NT, Me, 9x
MS-DOS
Linux (SUSE)

Technologies: Programming Languages (Visual Basic, C, Fortran)
Statistical Languages (S+, R, SAS)
Programming Libraries (Windows API, Windows .NET Framework)
Component Technology (COM, Ole, ActiveX)
Markup Languages (HTML)
Internet Authoring and Scripting (CGI/Perl, JavaScript)

Applications:

- Windows Installer Technologies (InstallShield, VS.NET)
- Databases (Access, SQL)
- Microsoft Office
- Microsoft Visual Studio (mostly focused on VB)
- Macromedia Dreamweaver
- Mathworks Matlab
- Adobe Photoshop/Macromedia Fireworks
- R for Windows/Linux
- TeX/LaTeX

Refereed Papers

Hallam, T.G., et al. *Ecological, Economic, and Evolutionary Corollaries of Insectivory in Transgenic Cotton* (to be submitted to Proceedings of the National Academy of Sciences).

Purucker, S.T, C.J.E. Welsh, R.N. Stewart, and P. Starzec. *Use of habitat-contamination spatial correlation to determine when to perform a spatially explicit ecological risk assessment* (to be submitted to Ecological Modelling).

Book Chapters

Holland, J., S.M. Bartell, T.G. Hallam, S.T. Purucker, C.J.E. Welsh 2002. *Role of Computational Toolkits in Environmental Management*. Chapter 6 in Dale, V.H. (editor). Ecological modeling for resource management. New York: Springer-Verlag.

Drake, J.A., C.R. Zimmerman, and S.T. Purucker 1998. *On the nature of the assembly trajectory*. Chapter 5 of "The Search for Assembly Rules in Ecological Communities." Cambridge University Press, Cambridge, UK.

Technical Reports

Stewart, R.N. and S.T. Purucker 2006. *SADA: A Freeware Decision Support Tool Integrating GIS, Sample design, Spatial Modeling, and Risk Assessment*. Proceedings of the Third Biennial Meeting of the International Environmental Modelling and Software Society, Burlington, Vermont (submitted).

Stewart, R.N. and S.T. Purucker 2005. *Spatial Approaches for Subsurface Sample Design, Characterization, and Decision Support*. Proceedings of the American Nuclear Society Topical Meeting on Decommissioning, Decontamination, and Reutilization, Denver, Colorado.

Quantum Environmental & Engineering Services 2004. *Badgett Road Landfill Ground Water Sampling Report - Round 2*. Knoxville, Tennessee

Environmental Systems Corporation 2003. *Badgett Road Landfill Ground Water Sampling Report - Round 1*. Knoxville, Tennessee.

Environmental Systems Corporation 2003. *Hollis Hodgson Dump Human Health Risk Assessment* (CERCLA ID 987791167 Tennessee Superfund 45-503).

Environmental Systems Corporation 2003. *Hollis Hodgson Vapor Monitoring Work Plan*. Knoxville, Tennessee.

Environmental Systems Corporation 2002. *Interim Findings From Surface Soil Sampling Project: Site Evaluation at the I-40/I-640 Sinkhole Site*. Knoxville, TN

- Environmental Systems Corporation 2002. *Badgett Road Landfill Phase II Site Evaluation Report*. Knox County, Tennessee.
- Environmental Systems Corporation 2000. *Focused Feasibility Study Report State Street Superfund Site* (TDSF Site ID# 57-525) Jackson, Tennessee.
- Environmental Systems Corporation 2000. *Risk Assessment for South Oaks Subdivision Soil Pile*, Knoxville Utilities Board.
- Environmental Systems Corporation 1999. *Phase II Site Evaluation Report TDOT State Street Site*. Jackson, Tennessee.
- Environmental Systems Corporation 1999. *Harper's Cave Waste Human Health Risk Assessment, Foote Mineral Company*. Knoxville, TN.
- Jacobs Engineering 1998. *Remedial Investigation of the Bethel Valley Watershed, Oak Ridge National Laboratory, Oak Ridge, Tennessee: Human Health Risk Assessment*.
- Environmental System Corporation 1998. *Phase II Site Evaluation Report for Former Kay's Ice Cream Facility, Knoxville, Tennessee: Human Health and Ecological Risk Assessment Appendix*.
- Purucker, S.T., R.R. Bonczek, and F.G. Dolislager 1998. *Technetium-99 Transport Modeling Results for Sources at SWMUs 7 and 30 at the Portsmouth Gaseous Diffusion Plant, Paducah, Kentucky*. KY/EM-266.
- Welsh, C.J.E. and S.T. Purucker 1998. *Quantitative Uncertainty Analysis of a Terrestrial Food Chain Exposure Model Used in Ecological Risk Assessment*. ORNL/TM-.
- Purucker, S.T. 1997. *Method for Calculating Preliminary Remediation Goals in Groundwater Based on Soil Concentrations*. ORNL/TM-251.
- CDM Federal Programs Corporation, Scientific Applications International 1997. *Remedial Investigation Report on the Melton Valley Watershed at Oak Ridge National Laboratory, Oak Ridge, Tennessee*. DOE/OR/01-1546/V2&D2.
- Dawoud, E.A. and S.T. Purucker 1997. *Quantitative Uncertainty Analysis of Superfund Residential Risk Pathway Models for Soil and Groundwater*. ORNL/TM- .
- Clapp, R.B., Y.S. Bao, T.D. Moore, A.L. Brenkert 1996. *Waste Area Grouping Phase 1 remedial Investigation: Sediment and Cesium-137 transport modeling report*. ORNL/ER-367.
- Ford, C.J., J. E. Nyquist, S. T. Purucker, and R. F. Winterfield 1996. *Characterization and Inventory of Contaminants in WAG 2 Floodplain Soils of White Oak Creek*. ORNL/TM-13208. ORNL/ESD-4538.
- Borders, D.M., D.J. Pridmore, J.J. Beauchamp, D.E. McConnell, S.T. Purucker, and T.M. Scanlan 1996. *Waste Area Grouping 2 Phase 1 Remedial Investigation Tributary Data Assessment Report*. ORNL/TM-362.
- Dawoud, E.A., S.T. Purucker, and R.R. Bonczek 1995. *Calculations of Excess Cancer Risk from Dermal Contact with Emitting Radionuclides in Soil*. (In revision) *Risk Analysis: An International Journal*.
- Stewart, R.N., A.Q. Armstrong, B.R. James, D.M. Douthat, and S.T. Purucker 1995. *Cost Versus Risk Reduction in Remedial Action: A Decision Framework*. ORNL/TM-13143.
- Stewart, R.N., S.T. Purucker, and B.F. Lyon 1995. *Geostatistical Applications in Environmental Remediation*. ES/ER/TM-146.
- Purucker, S.T, C.J.E. Welsh, R.C. Kramel and J.R. Duncan 1995. *Threatened and Endangered Species Survey at Wright-Patterson Air Force Base, Operable Unit 3*. Report to

HAZWRAP.

- Miller, P.D., C.W. McGinn, S.T. Purucker, and R.K. White 1995. *Defining the Role of Risk Assessment in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation Process at the DOE-OR.* ES/ER/TM-58.
- Purucker, S.T. and R.N. Stewart 1995. *Decision Analysis Applications: White Paper.* ORNL/TM-.
- Stewart, R.N., C.J. Maxwell, and S.T. Purucker 1995. *Methods for Improving Exposure Concentration Calculations in Human Health Risk Assessment.* ORNL/TM-
- McGinn, C.W. and S.T. Purucker 1995. *White Paper Report for the Oak Ridge Reservation Site-wide/Integrator Unit Human Health Risk Assessment Strategy.*
- Clapp, R.B., and J.A. Watts Eds. 1995. *Fourth Annual Report of Environmental Restoration Monitoring and Assessment at Oak Ridge National Laboratory.* DOE/OR/01-0143&D1.
- Moyer, J.H. and S.T. Purucker 1995. *Enhancing Defensibility of the Environmental Benefit Assessment Matrix (ERBAM) by Incorporation of Relevant and Available Human Risk Information.* ES/ER/TM-140.
- Kramel, R.C., and S.T. Purucker 1995. *Solid Waste Storage Area 5 Risk Assessment Report.*
- Bechtel National, Inc. 1995. *Remedial Investigation Report on Waste Area Grouping 5 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* DOE/OR/01-1326&D0.
- Dawoud, E.A., S.T. Purucker, and R.R. Bonczek 1994. *Development of Preliminary Remediation Goals for Dermal Contact with Beta Emitting Radionuclide ⁹⁹Tc in Soil, Sediment, Surface Water of Portsmouth Gaseous Diffusion Plant.* POEF/ER-.
- McGinn, C.W., P.D. Miller, S.T. Purucker, and R.K. White 1994. *Standardized Risk Assessment Approach for Evaluating Source Control operable Units to Support Expedited Actions at the Oak Ridge Reservation.* DOE/ER/ES/TM-58.
- Purucker, S.T., B.F. Lyon, L.D. Nanstad, R.N. Stewart 1994. *Decision Support for CERCLA Investigations: An Introduction to Decision Analysis Applications.* ES/ER/TM-134.
- Purucker, S.T. and B.F. Lyon. 1994. *Risk Based Decision-Making in the Feasibility Study.* ORNL/TM-111.
- Scientific Applications International Corporation. 1994. *Characterization Plan for the Oak Ridge National Laboratory Area-Wide Groundwater Program, Oak Ridge, Tennessee.* DOE/OR/01-1252&D2.
- Lee, R.R., A.H. Curtis, L.M. Houlberg, S.T. Purucker, M.L. Singer, M.F. Tardiff, and D.A. Wolf. 1994. *Site Characterization Plan for Groundwater in Waste Area Grouping 1 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* ORNL/ER-248.
- Watkins, D.R. and S.E. Herbes editors. T.L. Ashwood, L.A. Baron, D.M. Borders, B.B. Burgoa, R.B. Clapp, D.S. Hicks, R.H. Ketelle, S.T. Purucker, G.W. Suter, and R.F. Winterfield 1994. *Remedial Investigation Work Plan for Waste Area Grouping 2 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* DOE/OR/01-1292&D0. ORNL/ER-251&D2.
- Clapp, R.B., J.A. Watts, and M.A.S. Guth Eds. 1994. *Third Annual Report of Environmental Restoration Monitoring and Assessment at Oak Ridge National Laboratory.* DOE/OR/01-1290&D0.
- Jacobs Engineering Group Inc. 1994. *Remedial Investigation/Feasibility Study/Environmental Assessment for the Gunite and Associated Tanks Operable Unit at Waste Area Grouping 1 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* DOE/OR/02-1236&D1.

- Boston, H.L., S.B. Garland II, L.D. Hyde, E.A. Krispin, A.J. Kuhaida, Jr., S.T. Purucker, J.C. Dee, and L.A. Holm 1994. *Implementation of an Approach for Streamlining Environmental Restoration at Federal Facilities*. Proceedings of the International Specialty Conference. Cost Effective Acquisition and Utilization of Data in the Management of Hazardous Waste Sites. Air & Waste Management Association. Pittsburgh, PA, pp. 69-82.
- Lyon, B.F., S.T. Purucker, and R.N. Stewart 1994. *The Value of Perfect Information: How Much is a Crystal Ball Worth?* Proceedings of the International Specialty Conference. Cost Effective Acquisition and Utilization of Data in the Management of Hazardous Waste Sites. Air & Waste Management Association. Pittsburgh, PA. pp. 44-55.
- Purucker, S.T and B.F. Lyon 1994. *Decision Analysis Applications and the CERCLA Process*. Proceedings of the International Specialty Conference. Cost Effective Acquisition and Utilization of Data in the Management of Hazardous Waste Sites. Air & Waste Management Association. Pittsburgh, PA, pp. 56-68.
- Jacobs Engineering Group Inc. 1994 *Remedial Investigation/Baseline Risk Assessment for the Gunitite and Associated Tanks Operable Unit at West Area Grouping 1 at Oak Ridge National Laboratory, Oak Ridge, Tennessee*. DOE/OR/02-1275&D1.
- Blaylock, B.G., M.L. Frank, F.O. Hoffman, P.D. Miller, S.T. Purucker, A. Redfearn, and R.K. White 1993. *Human Health Risk Assessment Screening Approach for Evaluating Contaminants at Source Control and Integrator Operable Units*, pp. 393-406 in *Developing Cleanup Standards for Contaminated Soil, Sediment, and Groundwater*. Proceedings of Specialty Conference Series, January 10-13, 1993, Washington DC.
- Martin Marietta Energy Systems 1993. *X-231B Oil Degradation Plot Risk Assessment*.
- Purucker, S.T., C.E. Lanier, and B.A. Ladd. 1993. *Risk Characterization Data Manual*, Martin Marietta Energy Systems.
- R.B. Clapp ed. 1993. *Second Annual Report of the Environmental Restoration Monitoring and Assessment Program at Oak Ridge National Laboratory for FY 1993*, Martin Marietta Energy Systems, June 1993.
- McGinn, C.W., P.D. Miller, S.T. Purucker, R.A. Shaw and R.K. White 1993. *Standardized Human Health Risk Assessment Approach for the Oak Ridge Reservation*, Martin Marietta Energy Systems.
- Purucker, S.T. 1992 *Risk Evaluation for the W-12 Tank*.
- Blaylock, B.G., M.L. Frank, F.O. Hoffman, S.T. Purucker, A. Redfearn, R.K. White. 1992. *Human Health Risk Assessment Screening Approaches for Evaluating Contaminants at Source Control Operable Units*.