

**Theresa Jean Brown**  
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Dr. Theresa Brown is a Distinguished Member of Technical Staff at Sandia National Laboratories and the Applications lead for the Complex Adaptive Systems of Systems (CASoS) Engineering Initiative and the science advisor to National Infrastructure Simulation and Analysis Center (NISAC). She was the Technical Lead for the NISAC work at Sandia from 2005-2010. NISAC is a joint program with staff at DHS in the Infrastructure Strategy and Analysis Division, at Los Alamos National Laboratory and at Sandia, which provides analysis in support of infrastructure protection decisions. NISAC activities include development of improved methods for asset prioritization, providing fast-turn analyses for DHS on an event basis (e.g., potential hurricane impacts), analysis of the potential impacts of an influenza pandemic and recommendations for preparedness and mitigating those impacts. Theresa's technical expertise is in conceptual model development and decision-making under uncertainty using vulnerability and risk analyses and probabilistic performance assessments. While at Sandia National Laboratories, this expertise has been applied to infrastructure interdependencies vulnerability assessment, probabilistic performance assessments of radioactive waste disposal sites for the Department of Energy, risk assessment methodology development and analyses for the Nuclear Regulatory Commission. Theresa has a Ph.D. in Geology from the University of Wisconsin - Madison, an M.A. in Geology from the University of Texas at Austin and a B.S. in Earth Science and Secondary Science Education from Adams State College. She has been an Adjunct Professor at the University of New Mexico, the Wellhead Protection Project Coordinator for the City of Stevens Point, Wisconsin, a Geologist for Associated Drilling in Austin, Texas and the Crew Leader on a National Geographic Society paleontological dig. Theresa has been a Sandian since 1994.

## **EDUCATION**

Ph.D., Geology, (minor Atmospheric & Oceanic Science), Univ. of Wisconsin - Madison, 1994

M.A., Geology, University of Texas at Austin, 1989

B.S., Earth Science, Secondary Science Education, Adams State College, 1981

## **AWARDS**

Lockheed Martin 2007 **NOVA Award** for Full Spectrum Leadership

Sandia National Laboratories 2007 **Employee Recognition Award** for individual leadership on the NISAC program

NNSA Certificate of Recognition for individual dedication and technical contribution to the Greater Confinement Disposal Project

Association for Women Geoscientists Outstanding Women in Geoscience Student Award 1981

## **PUBLICATIONS**

### ***Peer-Reviewed Journals***

O'Reilly, Gerard, A Jrad, TJ **Brown**, and SH Conrad, 2006. Critical Infrastructure Analysis of Telecom for Natural Disasters, Networks 2006.

Min, H-S. J., WE Beyeler, TJ **Brown**, JS Young, and A Jones, 2006 "Toward Modeling and Simulation of Critical National Infrastructure Interdependencies" IIE Transactions 39 (01),

**Brown**, Theresa J., WE Beyeler and D Barton, 2004. Assessing Infrastructure Interdependencies:

The Challenge of Risk Analysis for Complex Adaptive Systems, International Journal of Critical Infrastructures Vol. 1, 1, p. 108-117.

Webb, Erik, SH. Conrad and T.J. **Brown**, 1996, "An Iterative, Probabilistic Environmental Decision Analysis Approach," in Risk Based Decision Making in Water Resources VII, Y. Haimes, D. Moser and E. Stakhiv, eds, American Society of Civil Engineers, New York, p. 249-264.

**Brown**, Theresa J. and JM Sharp, Jr., 1992, A model for the effects of point-source emission of aerosols on ground-water systems: Applied Hydrogeology, 1992/3, p. 33-46.

Rogers, K.L., CA Reppenning, RM Forester, EE Larson, SA Hall, GR Smith, E Anderson and TJ **Brown**, 1985, Middle Pleistocene climatic changes in south-central Colorado: National Geographic Research, 1(4) p. 535-563.

### **Books**

**Brown**, Theresa J., 2008. "Dependency Indicators", Wiley Handbook of Science and Technology for Homeland Security.

**Brown**, Theresa J., 2007. "Multiple Modeling Approaches and Insights for Critical Infrastructure Protection", in Computational Models of Risks to Infrastructure, NATO Science for Peace and Security Series D: Information and Communication Security, Vol. 13. IOS Press, Amsterdam p. 329.

### **Government Reports**

Glass, Robert J, WE Beyeler, SH Conrad, NS Brodsky, PG Kaplan, and TJ **Brown**, 2003, Defining Research and Development Directions for Modeling and Simulation of Complex, Interdependent Adaptive Infrastructures, Sandia National Laboratories Report

Beyeler, W.E., WA Hareland, FA Duran, TJ **Brown**, EA Kalinina, DP Gallegos and PA Davis, 1999, Residual Radioactive Contamination from Decommissioning: Parameter Analysis, NUREG/CR-5512, Vol. 3, U.S. Nuclear Regulatory Commission, Washington, DC.

Haaker, R., TJ **Brown** and D Updegraff, 1999, Comparison of the Models and Assumptions used in the DandD1.0, RESRAD 5.61 and RESRAD-Build 1.50 Computer Codes with Respect to the Residential Farmer and Industrial Occupant Scenarios Provided in NUREG/CR-5512, NUREG/CR-5512, Vol. 4, U.S. Nuclear Regulatory Commission, Washington, DC.

Moore, BA, BM.Crowe, BW Arnold, TJ **Brown**, JR Cochran, RB Gilbert, BA Luke, FS Shuri, EA Strassburger, GV Wilson and SR Wirth, 1998, Consequences of Subsidence for the Area 3 and Area 5 Radioactive Waste Management Sites, Nevada Test Site, DOE/NV-502, Department of Energy Nevada Operations Office, Las Vegas, p.66.

**Brown**, Theresa J., B Moore, G Disher and J Gardner, 1993, Wellhead Protection Program and Monitoring System Design, Stevens Point, Wisconsin, in: Case Studies in Wellhead Protection Area Delineation and Monitoring, B.A. Moore, ed. EPA-600/R-93/April 1993, Chapter 2.

Finkbeiner, M., B Moore and TJ **Brown**, 1991, Aerial Photographic Source Assessment for Wellhead Protection, Stevens Point Wisconsin, Vol. 1&2, U.S.E.P.A., Environmental Monitoring Systems Laboratory Publication, Las Vegas, p.211.

## Research Support

(Ongoing research support)

Title: National Infrastructure Simulation and Analysis Center  
PI: Kayser (SNL), Brown (SNL), Ammerlahn (SNL) ; Michelson (LANL), Smith (LANL), Berscheid (LANL)  
Source of Support: Office of Infrastructure Protection, US Department of Homeland Security  
Total Award Amount: 181600K  
Total Award Period Covered: FY 02-11  
Location of Project: SNL and LANL

Title: Policy Complex Adaptive Systems of Systems Engineering and Application to Policy Evaluation and Design  
PI: Brodsky  
Source of Support: US Food and Drug Administration  
Total Award Amount: 2500K  
Total Award Period Covered: FY 10-11  
Location of Project: SNL

Title: Complex Adaptive Systems of Systems Engineering and Application to the Global Energy System  
PI: Glass  
Source of Support: Laboratory Directed Research and Development, Sandia National Laboratory  
Total Award Amount: 1925K  
Total Award Period Covered: FY 09-11  
Location of Project: SNL

Title: Vulnerability of Multi-network Systems to Cascading Failure  
PI: Glass  
Source of Support: Laboratory Directed Research and Development, Sandia National Laboratory  
Total Award Amount: 1270K  
Total Award Period Covered: FY 09-11  
Location of Project: SNL

(Completed research support)

Title: Uncertainty Quantification and Validation of Combined Hydrological and Macroeconomic Analyses  
PI: Brown  
Source of Support: Laboratory Directed Research and Development, Sandia National Laboratory  
Total Award Amount: 75K  
Total Award Period Covered: FY 10  
Location of Project: SNL

Title: Vulnerability Analysis of the Strategic Petroleum Reserve's Critical Infrastructures and Cyber Systems  
PI: Torres (SNL)  
Source of Support: Fossil Energy, US DOE  
Total Award Amount: 500K  
Total Award Period Covered: FY 02  
Location of Project: SNL

Title: Dynamic Infrastructure Interdependency Simulation and Analysis  
PI: Brown (SNL)

Source of Support: Energy Assurance, US DOE  
Total Award Amount: 780K  
Total Award Period Covered: FY 02-04  
Location of Project: SNL

Title: National Infrastructure Simulation and Analysis Center  
PIs: Rinaldi (SNL), Kayser (SNL), Michelson (LANL)  
Source of Support: Office of Energy Assurance, US DOE  
Total Award Amount: 4500K  
Total Award Period Covered: FY 00-01  
Location of Project: SNL, LANL

Title: Residual Radioactive Contamination from Decommissioning: Development and Testing of the DandD Screening Tool  
PI: Brown (SNL)  
Source of Support: US Nuclear Regulatory Commission  
Total Award Amount: 1500K  
Total Award Period Covered: FY 98-99  
Location of Project: SNL

Title: Performance Assessment of the Greater Confinement Disposal Facility  
PIs: Gallegos (SNL), Brown (SNL) and Cochrane (SNL)  
Source of Support: Nevada Operations Office, US DOE  
Total Award Amount: 4500K  
Total Award Period Covered: FY 97-99  
Location of Project: SNL

Title: Wellhead Protection Program and Monitoring System Design, Stevens Point, Wisconsin  
PI: Brown (City of Stevens Point)  
Source of Support: Environmental Monitoring Systems Laboratory, US EPA  
Total Award Amount: 150K  
Total Award Period Covered: FY 91-93  
Location of Project: Stevens Point, WI