

## Nicole D. Jackson, Ph.D.

Principal Member of the Technical Staff  
Sandia National Laboratories

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## Research Interests

I develop data-driven frameworks to understand how extreme weather affects critical infrastructure and coupled human-natural systems. By integrating climate science, machine learning, and systems analysis, I create actionable insights that advance infrastructure resilience and connect climate projections to operational decision-making. Current research areas include:

- Cascading impacts on energy, water, and food systems from individual and compound threats
- Machine learning for predicting infrastructure performance under threat-induced stress
- Resource constraints and interdependencies in infrastructure systems

## Education

**Ph.D. Civil Engineering**, University of Illinois at Urbana-Champaign 2020  
Advisor: Megan Konar; Committee: Kathy Baylis, Ximing Cai, and Peter Debaere (Univ. of Virginia)  
Dissertation: *From Global to Local: Understanding Linkages Between Climate Shocks and Food Security*

**M.S. Materials Science & Engineering**, University of Illinois at Urbana-Champaign 2014

**M.S. Engineering Mechanics**, Virginia Tech 2008  
Advisor: Scott Case; Committee: Jack Lesko and Carin Roberts-Wollmann  
Thesis: *Reliability-based Durability Assessment of GFRP Bars for Reinforced Concrete*

**B.S. Civil Engineering**, University of Illinois at Urbana-Champaign 2005  
Minor in International Engineering – Germanic Studies

## Professional and Research Appointments

**Sandia National Laboratories**, Albuquerque, NM  
Earth, Water, & Energy Systems Department  
Principal Member of the Technical Staff 04/2025 – Present  
Senior Member of the Technical Staff 07/2021 – 04/2025  
Postdoctoral Appointee (Mentors: Thushara Gunda, Andrea Staid, Vince Tidwell) 11/2019 – 07/2021

**University of Illinois at Urbana-Champaign**, Urbana, IL  
Graduate Research Assistant 01/2019 – 08/2019  
Department of Bioengineering, Karin Jensen Research Group

**University of Illinois at Urbana-Champaign**  
Graduate Research Assistant 08/2014 – 11/2019  
Department of Civil & Environmental Engineering, Megan Konar Research Group

**U.S. Environmental Protection Agency**, Cincinnati, OH  
Physical Sciences Trainee 06/2014 – 02/2016  
Land Remediation and Pollution Control Division

**University of Illinois at Urbana-Champaign**

Project Manager

08/2013 – 08/2013

Learning-in-Community: Haiti Infrastructure and Development

**University of Illinois at Urbana-Champaign**

Graduate Research Assistant

08/2008 – 04/2010

Department of Civil &amp; Environmental Engineering, John S. Popovics Research Group

**Virginia Tech**

Graduate Research Assistant

01/2007 – 08/2007

Department of Engineering Science &amp; Mechanics, Materials Research Group

08/2004 – 12/2005

**University of Illinois at Urbana-Champaign**

Undergraduate Research Assistant

05/2003 – 08/2003

Department of Civil &amp; Environmental Engineering, John S. Popovics Research Group

**Arizona State University**

Undergraduate Research Assistant

06/2002 – 08/2002

Del E. Webb School of Construction, Christine Fiori Research Group

## Honors and Awards

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### External and National Awards

**IEEE Resilience Week Best Paper Award**

2025

Recognition for receiving the highest reviewer score among all accepted papers at the 2025 IEEE Resilience Week Conference for the paper "Spatio-Temporal Modeling of Weather-related Compound Threats to Power Systems Using Markov Random Fields"

**Most Promising Engineer in Industry Award**

2024

Nationally competitive recognition of demonstrated tremendous potential for future technical contributions. Sponsored by the Black Engineer of the Year Awards.

**MGB-SIAM Early Career (MSEC) Fellow**

2022-2024

1 of 10 early career professionals selected for inaugural class of fellows. Jointly sponsored by the Society for Industrial and Applied Mathematics and Mathematically Gifted & Black

**Bay Area Research Slam Finalist**

2021

1 of 3 Sandia postdocs in a research competition sponsored by Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and SLAC National Accelerator Laboratory

**Rising Stars in Civil & Environmental Engineering Participant**

2019

1 of 20 early career women competitively chosen for a workshop on careers in academia at the Massachusetts Institute of Technology

**Congressional Visit Days Participant**

2017

1 of 2 members sponsored by the American Geophysical Union to engage with Illinois congressional staff members to advocate for federal funding of scientific research

## Sandia National Laboratories Awards and Professional Recognition

|                                                                                                                                                                                                                     |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Spot Award for exception performance in proposal writing</b>                                                                                                                                                     | 2026 |
| Recognition for outstanding proposal writing demonstrated by successful submission of multiple complex proposals over a demanding four-month period and showcased exceptional dedication, expertise, and resilience |      |
| <b>Spot Award for supporting hiring and mentorship in the Discrete Math &amp; Optimization department</b>                                                                                                           | 2026 |
| Recognition for excellent work reviewing candidate applications as well as mentorship of interns and postdocs                                                                                                       |      |
| <b>Spot Award for technical leadership in supporting DOE's energy-water resilience white paper call</b>                                                                                                             | 2025 |
| Recognition for her expertise in the field and going above and beyond to ensure Sandia's submissions were of high technical quality                                                                                 |      |
| <b>Thunderbird Kudos for supporting UIUC Spring 2025 weSTEM Conference</b>                                                                                                                                          | 2025 |
| Recognition for supporting Sandia's sponsorship and engagement with the University of Illinois' GradSWE chapter event                                                                                               |      |
| <b>Thunderbird Kudos for START HBCU Intern Mentoring</b>                                                                                                                                                            | 2024 |
| Recognition for dedication and mentoring of Security top Academic Research & Talent at Historically Black Colleges and Universities Program (START HBCU) institute interns                                          |      |
| <b>Spot Award for Strong Teaming in Hydropower</b>                                                                                                                                                                  | 2022 |
| Recognition for strong teaming with the Water Power Program and developing a valuable hydropower proposal with Idaho National Laboratory                                                                            |      |
| <b>Thunderbird Kudos for presentation to the EGCoP</b>                                                                                                                                                              | 2025 |
| Recognition for giving a technical presentation to Sandia's Electric Grid Communication of Practice                                                                                                                 |      |
| <b>Postdoctoral Technical Showcase Third Place</b>                                                                                                                                                                  | 2020 |
| Recognition from the Sandia Postdoctoral Association                                                                                                                                                                |      |

## Graduate and University Awards

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|-------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Academic Leadership for Women in Engineering Travel Grant Recipient (\$2000)</b>                                                 | 2018        |
| Sponsored by the Society of Women Engineers                                                                                         |             |
| <b>List of Teachers Ranked as Excellent with Outstanding Ranking (x2)</b>                                                           | 2018        |
| Recognition at University of Illinois at Urbana-Champaign based on student course evaluations with instruction rated in the top 10% |             |
| <b>Diversifying Faculty in Higher Education in Illinois Fellowship (\$30,000)</b>                                                   | 2017 – 2019 |
| Tuition and stipend provided by the State of Illinois                                                                               |             |
| <b>Mavis Future Faculty Fellowship (\$2000)</b>                                                                                     | 2017 – 2018 |
| Fellowship from the University of Illinois at Urbana-Champaign College of Engineering                                               |             |
| <b>Fall Conference Travel Grant Recipient (\$425)</b>                                                                               | 2016        |

Sponsored by University of Illinois at Urbana-Champaign Graduate College and Department of Civil & Environmental Engineering

**Fall Conference Travel Grant Recipient (\$425)** 2015

Sponsored by University of Illinois at Urbana-Champaign Graduate College and Department of Civil & Environmental Engineering

**List of Teachers Ranked as Excellent** 2014

Recognition at University of Illinois at Urbana-Champaign based on student course evaluations

**Support for Under-represented Groups in Engineering (SURGE) Fellowship (\$22,000)** 2008 – 2009

Tuition and stipend from the University of Illinois at Urbana-Champaign College of Engineering

**Summer Pre-doctoral Institute Fellow (\$2500)** 2008

Summer stipend and housing allowance from the University of Illinois at Urbana-Champaign Graduate College

**Integrative Graduate Education and Research Trainee in Macromolecules (\$30,000)** 2004 – 2005

Tuition and stipend provided by the National Science Foundation and Virginia Tech

## Funding

⇒ **Total grant funding:** \$15,681,353 (Funds managed by N.D. Jackson: \$3,899,289)

**“Multivariate Extreme Value Analysis for Evaluating the Impacts of Compound Extreme Weather Events (MCEE)”** 2025-2028

Role: **Task Lead** for Climate Impacts Assessment with PI Lyndsay Shand (Sandia National Laboratories)

Sponsor: Sandia National Laboratories – Laboratory Directed Research & Development (LDRD) Earth Science Research Foundation Investment Area \$1,681,000

**“REDEEMS: RESilience-Driven Energy Expansion Modeling for Strategic planning”** 2025-2028

Role: **Threat Analysis Lead** with PI Thushara Gunda (Sandia National Laboratories)

Sponsor: Sandia National Laboratories – LDRD Resilient Energy Systems Mission Campaign \$1,200,000

**“Hazard-Outage Vulnerability (HOV) Insight Tool for Energy Planning: Leverage Historical Insights to Plan for Future Vulnerability”** 2025

Role: **Senior Personnel** with PI Thushara Gunda (Sandia National Laboratories)

Sponsor: U.S. Department of Energy \$167,000

**“Integrating Long-Duration Energy Storage into Planning, Markets, and Operations”** 2025-2027

Role: **Task Lead** for Weather Statistics and Markov Modeling with PI Ralph Masiello (Quanta Technologies)

Sponsor: U.S. Department of Energy Grid Deployment Office \$1,500,000

Note: Selected for funding, rescinded due to federal policy changes (2025)

**“Security Solar Technologies through Optimization, Resilience and Modeled Systems” (STORMS)** 2024-2026

Role: **Senior Personnel** with PI Laurie Burnham (Sandia National Laboratories)

Sponsor: U.S. Department of Energy Solar Energy Technology Office \$2,641,263

**“Cyber Physical Hazard Oriented-Assessment of Natural-Events” (CyPHOON)** 2024-2025

|                                                                                                                                                                                                                                                                                                                                                                        |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Role: <b>PI</b> with Institutional PI Andrea Staid (EPRI)                                                                                                                                                                                                                                                                                                              |             |
| Sponsor: U.S. Department of Energy Office of Cybersecurity, Energy Security, and Emergency Response (CESER)                                                                                                                                                                                                                                                            | \$500,000   |
| <b>“Multi-hazard, Multi-objective, Multi-investment Optimal Transmission Infrastructure Expansion Planning for Natural Disaster Resilience” (3M)</b>                                                                                                                                                                                                                   | 2024-2027   |
| Role: <b>Task Lead</b> for Compound Hazard Modeling with PI Kyle Skolfield (Sandia National Laboratories)                                                                                                                                                                                                                                                              |             |
| Sponsor: Sandia National Laboratories – LDRD Resilient Energy Systems Mission Campaign                                                                                                                                                                                                                                                                                 | \$1,850,000 |
| <b>“Enhanced Prediction in Chaotic Systems with Physics-Learned Autonomous Neural Networks” (EPIC PLANN)</b>                                                                                                                                                                                                                                                           | 2023 – 2026 |
| Role: <b>PI</b> with Institutional PI Louis Scuderi (University of New Mexico)                                                                                                                                                                                                                                                                                         |             |
| Sponsor: Sandia National Laboratories – LDRD Earth Science Research Foundation Investment Area                                                                                                                                                                                                                                                                         | \$1,439,000 |
| <b>“Water Management Project in Integrated Multisector Multiscale Modeling (IM3)”</b>                                                                                                                                                                                                                                                                                  | 2023 – 2025 |
| Role: <b>Institutional PI</b> with PI Jennie Rice (Pacific Northwest National Laboratory)                                                                                                                                                                                                                                                                              |             |
| Sponsor: U.S. Department of Energy Office of Science MultiSector Dynamics Program                                                                                                                                                                                                                                                                                      | \$500,000   |
| <b>Photovoltaic System Cost Benchmark</b>                                                                                                                                                                                                                                                                                                                              | 2023 – 2024 |
| Role: <b>Senior Personnel</b> with PI Jennifer Braid (Sandia National Laboratories)                                                                                                                                                                                                                                                                                    |             |
| Sponsor: U.S. Department of Energy Solar Energy Technology Office                                                                                                                                                                                                                                                                                                      | \$200,000   |
| <b>“Natural Disasters: Evaluating Impacts to Grid Resilience”</b>                                                                                                                                                                                                                                                                                                      | 2023 – 2024 |
| Role: <b>Co-Investigator</b> with PI Thushara Gunda (Sandia National Laboratories) & Institutional PI Surya Dhulipala (National Renewable Energy Laboratory)                                                                                                                                                                                                           |             |
| Sponsor: U.S. Department of Energy Solar Energy Technology Office                                                                                                                                                                                                                                                                                                      | \$600,090   |
| <b>“Probabilistic Impact Scenarios for Extreme Weather Event Resilience”</b>                                                                                                                                                                                                                                                                                           | 2022–2024   |
| Role: <b>Co-Project Lead</b> with Jean-Paul Watson (Lawrence Livermore National Laboratory), Roger Ghanem (University of Southern California), Cosmin Safta (Sandia), Emil Constantinescu (Argonne National Laboratory), Shinjae Yoo (Brookhaven National Laboratory, BNL), Aditi Krishnapriyan (Lawrence Berkeley National Laboratory), Xihai Luo (BNL), Wei Xu (BNL) |             |
| Sponsor: U.S. Department of Energy’s Scientific Discovery Through Advanced Computing                                                                                                                                                                                                                                                                                   | \$700,000   |
| <b>“Study of Straight-line Wind and Precipitation Hazard Return Periods Under Future Return Periods”</b>                                                                                                                                                                                                                                                               | 2022–2023   |
| Role: <b>PI</b>                                                                                                                                                                                                                                                                                                                                                        |             |
| Sponsor: U.S. Department of Energy Nuclear Safety Research and Development Program (2022 EHSS-30 NSRD 100043)                                                                                                                                                                                                                                                          | \$273,000   |
| <b>“Completing the Feedback Loop: Linking Data, Operation and Maintenance, Manufacturers, and Insurance Markets”</b>                                                                                                                                                                                                                                                   | 2022 – 2025 |
| Role: <b>Institutional PI</b> (Sandia National Laboratories) with PI Adam Shinn (kWh Analytics) and Institutional PI Andy Walker (National Renewable Energy Laboratory)                                                                                                                                                                                                |             |
| Sponsor: U.S. Department of Energy Solar Energy Technology Office (DE-EE0009827)                                                                                                                                                                                                                                                                                       | \$1,967,000 |
| <b>“Resilience of Global Chemical Facilities to Climate Change”</b>                                                                                                                                                                                                                                                                                                    | 2022        |
| Role: <b>Task Lead</b> for Characterization of Climate Risk with PI Andrew W. Nelson (Sandia National Laboratories) and Institutional PI Lina Sela (University of Texas at Austin)                                                                                                                                                                                     |             |

|                                                                                                 |             |
|-------------------------------------------------------------------------------------------------|-------------|
| Sponsor: Sandia National Laboratories – Climate Innovation Late Start LDRD                      | \$104,000   |
| <b>“Predictive Modeling of Weather Impacts on Utility-scale Photovoltaic Systems”</b>           | 2022        |
| Role: <b>PI</b>                                                                                 |             |
| Sponsor: Sandia National Laboratories – LDRD Exploratory Express                                | \$109,000   |
| <b>“FY22 Strategic Initiative: Climate Impacts on National Critical Infrastructure” (CINCI)</b> | 2021 – 2022 |
| Role: <b>Senior Personnel</b> with PI Jon Zimmerman (Sandia National Laboratories)              |             |
| Sponsor: Sandia National Laboratories                                                           | \$250,000   |

## Publications

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⇒ 44 total publications including 11 as first author ([Google Scholar Page](#))

† – indicates current or former mentee

## Journal Articles

- J14. A.G. Moore<sup>†</sup>, R.L. Valdez, T. Gunda, and **N.D. Jackson**. (*in press, 2026*) An Analysis of the Duration and Severity of Power Outages During Weather Events Across U.S. Counties, to appear in *Environmental Research: Energy*
- J13. K.L. Bonney, T. Gunda, S.B. Ferencz, and **N.D. Jackson**. (2026) Emulation of Monthly Water Allocations Using LSTM Models: A Case Study of the Colorado River Basin in Texas, *Environmental Research Communications*, Vol 8, Issue 5, pp 055040 ([paper](#)) ([data](#)) ([code](#))
- J12. H.H. Bokhari, F. Corsi, A. Miara, B.M. Fekete, S. Gangrade, S. Kao, **N.D. Jackson**, C.J. Vörösmarty. (2025) An Integrated Hydroclimatic Assessment of Future Reservoir and Hydropower Operations in the U.S, *Earth's Future*, Vol 13, Issue 9, pp e2025EF006203 ([paper](#)) ([code and data](#))  
Note: Paper is part of the Special Issue “Multi-Sector Dynamics: Advancing Complex Adaptive Human-Earth Systems Science in a World of Interconnected Risks”
- J11. T. Gunda, A. Moore<sup>†</sup>, **N.D. Jackson**, S. Dhulipala, and S. Awara. (2025) A resource adequacy assessment of correlated wide-area outages in the power grid, *Environmental Research: Energy*, Vol 2, Issue 2, pp 025009 ([paper](#)) ([data](#))  
Note: Paper is part of the “Focus on Natural Hazards, Disasters, and Extreme Events”
- J10. P.M. Johnson, **N.D. Jackson**, H. Baroud, and A. Staid. (2024) Can Socio-Economic Indicators of Vulnerability Help Predict Spatial Variations in the Duration and Severity of Power Outages Due to Tropical Cyclones? *Environmental Research Letters*, Vol 14, Issue 4, pp 044048 ([paper](#)) ([data and code](#))
- J9. K.L. Bonney, T. Gunda, M. Mendoza, M.L. Hopwood, and **N.D. Jackson**. (2023). pvOps: a Python Package for Empirical Analysis of Photovoltaic Field Data, *Journal of Open Source Software* ([paper](#)) ([software](#))
- J8. S. Gilletly, **N.D. Jackson**, and A. Staid. (2023) Evaluating the Impact of Wildfire Smoke on Solar Photovoltaic Production, *Applied Energy*, Vol 348, pp 121303 ([paper](#)) ([data](#))
- J7. **N.D. Jackson** and T. Gunda. (2021) Evaluation of Extreme Weather Impacts on Utility-scale Photovoltaic Plant Performance in the United States, *Applied Energy*, Vol 302, pp 117508 ([paper](#)) ([data](#))
- J6. **N.D. Jackson**, M. Konar, P. Debaere, and J. Sheffield. (2021) Crop-specific Exposure to Extreme Temperature and Moisture for the Globe for the Last Half Century, *Environmental Research Letters*, Vol 16, Issue 6, pp 064006 ([paper](#)) ([data](#))

- J5. R. von Gnechten, J. Wang, M. Konar, K. Baylis, P. Anderson, S. Giroux, **N.D. Jackson**, and T. Evans. (2020) A Gravity Model and Network Analysis of Household Food Sharing in Zambia, *Environmental Research Letters*, Vol 15, Issue 11, pp 115010 ([paper](#))
- J4. **N.D. Jackson**, M. Konar, P. Debaere, and L. Estes. (2019) Probabilistic Global Maps of Crop-Specific Areas from 1961 to 2014, *Environmental Research Letters*, Vol 14, Issue 9, pp 094023 ([paper](#)) ([data](#))
- J3. M. Niazi, C. Nietch, M. Maghrebi, **N.D. Jackson**, B.R. Bennett, M. Tryby, and A. Massoudieh. (2017) Storm Water Management Model: Performance Review and Gap Analysis, *Journal of Sustainable Water in the Built Environment*, Vol 3, Issue 2, pp 04017002 ([paper](#))
- J2. **N.D. Jackson**, M. Konar, and A.Y. Hoekstra. (2015) The Water Footprint of Food Aid, *Sustainability*, Vol 7, Issue 6, pp 6435-6456 ([paper](#))  
Note: Paper is part of the Special Issue "Water Footprints and Sustainable Water Allocation"
- J1. J.S. Popovics, G.P. Cetrangolo, and **N.D. Jackson**. (2006) Experimental Investigation of Impact-Echo Method for Concrete Slab Thickness Measurement, *Journal of the Korean Society for Nondestructive Testing*, Vol 26, Issue 6, pp 427-439 ([paper](#))

## Conference Proceedings

- C13. W.G. Chapman<sup>†</sup>, J.D. Smith, C. Teeter, and **N.D. Jackson**. (*in press*) Graph Reservoir Networks for Prediction of Spatiotemporal Systems, to appear in *Proceedings of the 2026 Neuro Inspired Computational Elements Conference*
- C12. **N.D. Jackson**, A. Sharma<sup>†</sup>, and J.K. Skolfield (2025) Spatio-Temporal Modeling of Weather-related Compound Threats to Power Systems Using Markov Random Fields, *2025 IEEE Resilience Week (RWS)*, National Harbor, Maryland, ([paper](#))
- C11. R.M. Alfant<sup>†</sup>, J.K. Skolfield, **N.D. Jackson**, and T.R. Edwards (2025) Generation and Transmission Expansion Planning for Resilience to Compound Hazards, *2025 IEEE Resilience Week (RWS)*, National Harbor, Maryland ([paper](#))
- C10. R.L. Valdez, T. Gunda, S.B. Ferencz, and **N.D. Jackson** (2025) Integrated Metrics for System Performance, Attributes, and Critical Threats for Resilience Analysis, *2025 IEEE Resilience Week (RWS)*, National Harbor, Maryland ([paper](#))
- C9. R.L. Valdez, A.G. Moore<sup>†</sup>, **N.D. Jackson**, and T. Gunda (2025) Evaluating Correlations between Risk Indices and Power Outages during Extreme Events, *2025 IEEE Resilience Week (RWS)*, National Harbor, Maryland ([paper](#))
- C8. A.G. Moore<sup>†</sup>, T. Gunda, and **N.D. Jackson** (2025) A Hazard-Informed Empirical Assessment of Floods and Snow Impacts to Utility-Scale Photovoltaic Systems, *2025 IEEE Resilience Week (RWS)*, National Harbor, Maryland ([paper](#))
- C7. R. Piansky, D.K. Molzahn, **N.D. Jackson**, and J.K. Skolfield. (2025) Evaluating Undergrounding Decisions for Wildfire Ignition Risk Mitigation across Multiple Hazards, *2025 IEEE Kiel PowerTech Conference*, Kiel, Germany ([paper](#))
- C6. G. Zhao, X. Luo, S. Yoo, and **N.D. Jackson**. (2024) GAN-based Extreme Conditional Distribution Estimation for Renewable Energy Systems, *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, Oslo, Norway ([paper](#))
- C5. R.M. Reck, Y. Li, S. Thompson, **N.D. Jackson**, and S. Debetwar. (2023) Preparing Women in STEM for Faculty Careers through a Job Search Workshop Series, *ASEE Annual Conference & Exposition, Conference Proceedings*, Baltimore, Maryland ([paper](#))

- C4. S. Gilletly, **N.D. Jackson**, and A. Staid. (2021) Quantifying Wildfire-Induced Impacts to Photovoltaic Energy Production in the Western United States, *48th IEEE Photovoltaic Specialists (PVSC)*, virtual ([paper](#))
- C3. **N.D. Jackson**, K.I. Tyler, Y. Li, W. Chen, C. Liu and R. Bhargava. (2017) Keeping Current: An Update on the Structure and Evaluation of a Program for Graduate Women Interested in Engineering Academia, *ASEE Annual Conference & Exposition, Conference Proceedings*, Dayton, Ohio ([paper](#))
- C2. K.I. Tyler, Y. Li, **N.D. Jackson**, W. Chen, C. Liu and R. Bhargava. (2017) Overcoming Difficulties in Research Statement Preparation for the Academic Job Search: Expansion of a Peer-Focused Professional Development Program, *ASEE Annual Conference & Exposition, Conference Proceedings*, Dayton, Ohio ([paper](#))
- C1. **N. Jackson**, Y. Malave, C.L. Roberts-Wollmann, S. Case, and J. Lesko (2005) Reliability-based Uniform Flexural Resistance Factors for GFRP Reinforced Concrete Members, *Third International Conference for Composites in Construction*, Lyon, France

## National Laboratory Reports

Note: National laboratory documents are subject to internal peer review before publication. Entries without links remain distribution-limited and are available only for official use.

- R9. T. Gunda, R. Valdez, **N. Jackson**, R. Cooper, A. Sorensen, and E. Sproul. (2024) Historical and Future Extreme Weather Conditions: A Case Study of Southeast China Provinces, Sandia National Laboratories, SAND2024-15880
- R8. T. Gunda, R. Valdez, **N. Jackson**, S. Price, and S. Goodnight. (2024) Potential Climate Change Impacts to Crop Production: Case Study of Rice and Winter Wheat in China, Sandia National Laboratories
- R7. A. Walker, J. Desai, T. Gunda, and **N. Jackson**. (2023) Operation and Maintenance of PV Systems: Data Science, Analysis, and Standards, National Renewable Energy Laboratory, NREL/TP-5C00-85819 ([report](#))
- R6. **N. Jackson**, T. Gunda, N. Gayoso, J. Desai, and A. Walker (2022) Operations, maintenance, and cost considerations for PV+ Storage in the United States, Sandia National Laboratories, SAND2022-16312 ([report](#))
- R5. A. Nelson, **N. Jackson**, J. Wingard, S. Paik, and T. Gunda (2022) Resilience of Global Chemical Facilities to Climate Change, Sandia National Laboratories, SAND2022-14347R
- R4. **N. Jackson** and H. Mendoza (2022) Predictive Modeling of Weather Impacts on Utility-scale Photovoltaic Systems, Sandia National Laboratories, SAND2022-14215R
- R3. A. Staid, E.S. Fleming, T. Gunda, and **N.D. Jackson** (2021) Critical Infrastructure Decision-Making Under Long-Term Climate Hazard Uncertainty: The Need for an Integrated, Multidisciplinary Approach, Sandia National Laboratories, SAND2021-11394 R ([report](#))
- R2. T. Gunda, **N.D. Jackson**, D. Sanchez, K. Klise, K. Ruehl, and S.Kuzio (2021) Advanced Data Analytics in Renewable Energy: Review of Capabilities, Needs, and Opportunities, Sandia National Laboratories, SAND2021-6297 R
- R1. T. Gunda, A. Neal, P. Carlson, C. Richardson, J.A. Perez, M. Aamir, B. Anderson, and **N.D. Jackson** (2020) TAOS: A Tool for Assisting Organization Selections for Security Integrated Assessments', Sandia National Laboratories, SAND2020-10751

## White Papers

Note: White papers are subject to internal peer review before publication. Entries without links remain distribution-limited and are available only for official use.

- W7. **N.D. Jackson**, M. Brown, and N.S. Rao (2025) Reinforcement Learning for Water-Energy Infrastructure Resilience and Evolution, SAND2025-13783O ([paper](#))
- W6. **N.D. Jackson**, S. Conrad, and N.S. Rao (2025) Operational Flexibility for Integrated Energy-Water Resilience, SAND2025-13749O ([paper](#))
- W5. P. Bhowmik, K. Cafferty, K. Klise, J.K. Skolfield, and **N.D. Jackson** (2025) Water Energy Planning Strategies to Meet Emerging Load from Data Centers, SAND2025-13692O ([paper](#))
- W4. R.L. Valdez, **N.D. Jackson**, S. Ferencz, and A. Wachtel (2025) Resilience by Design: Advanced Metrics and Comprehensive Methods for Energy-Water Systems Analysis, SAND2025-13704O ([paper](#))
- W3. T. Gunda, **N.D. Jackson**, Z. Kilwein<sup>†</sup>, K. Klise, and J.K. Skolfield (2025) Opportunities to Address Gaps in Atmospheric Phenomena for Energy Operations and Planning, SAND2025-13655O
- W2. J.K. Skolfield, T. Gunda, and **N.D. Jackson**. (2025) Flexible and MOdule Superstructure Optimization for Rapid Computational Advancements in Power Systems Expansion Planning, Sandia National Laboratories
- W1. T. Lowry, R. Garrett, T. Gunda, **N. Jackson**, K. Klise, C. Smallwood, K. Stamber, R. Taylor, S. Kuzio, and J. Zimmerman (2023) Climate Impacts on National Critical Infrastructure Strategic Initiative, Sandia National Laboratories

## Book Chapters

- B1. T. Gunda, R. Valdez, Z. Kilwein, J.K. Skolfield, R. Adams, and **N.D. Jackson** (in press) "Wiring Resilience for a Weather-Adapted Power Grid." *Critical Infrastructure Systems and Extreme Threat Nexus: Preparing Resilience and Security* Springer Nature. ([book](#))

## Manuscripts in Review and Revision

- M4. W. Han, C. Safta, J. Watson, **N.D. Jackson**, and R. Ghanem. (*in review*) "Power generation extremes with probabilistic learning on manifolds"
- M3. N. Rao, J. Lala, A. Miara, S. Cohen, H. Bokhari, **N.D. Jackson**, and F. Corsi. (*in review*) "Measuring Climate and Water Risk across the Bulk Power System"
- M2. **N.D. Jackson**, R. Valdez, J.K. Skolfield, T. Gunda, Z. Kilwein<sup>†</sup>, and A. Staid (*in revision*) "Planning and Operations for Grid Resilience to Compound Extreme Heat–Cyber Threats: Case Study of California and Arizona"
- M1. A. Sharma<sup>†</sup>, J. Kyle Skolfield, and **N.D. Jackson**. (*in revision*) "Spatio temporal relationships between wildfire and atmospheric data"

## Patents

- 1. G.W. Chapman, J.D. Smith, C. Teeter, and **N.D. Jackson**. Systems and Method for Forming Graph Reservoir Networks. 19/550,784 (*pending*).

## Invited Seminars & Presentations

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28. Panelist, Integrated Energy Infrastructure Planning under Extreme Weather Uncertainties, IEEE Resilience Week, National Harbor, MD, November 2025.
27. Panelist, Women in Data Science and Statistics, University of Illinois at Urbana-Champaign Department of Statistics and the School of Information Sciences, Urbana, IL, October 2025.
26. Panelist, Industry Career Panel, Society for Industrial and Applied Mathematics Annual Meeting (AN24), Spokane, WA, July 2024.
25. Machine Learning for the Energy Sector: Predicting Impacts and Understanding System Behavior, Multi-Sector Dynamics Community of Practice – AI Working Group, Virtual, June 2024.
24. Panelist, Career Pathways for MPE Enthusiasts, Society for Industrial and Applied Mathematics Conference on the Mathematics of Planet Earth (MPE24), Portland, OR, June 2024.
23. Extreme Weather and Climate Impacts to Energy Infrastructure, Sandia National Laboratories/Los Alamos National Laboratory Climate Science Summit, Los Alamos, NM, May 2024.
22. Building Resilience for Critical Infrastructure: Case Studies in Solar, Cornell University, April 2024.
21. Plenary Speaker, Modeling Extreme Weather Impacts: Case Studies in Utility-scale Solar, Mathematics - Opportunities in Research and Education (MORE), Clemson University, Clemson, South Carolina, October 2023.
20. Probabilistic Impact Scenarios for Extreme Weather Event Resilience, SciDAC Principal Investigator Meeting, Rockville, MD, September 2023.
19. Panelist, Preparing for the Storm: Managing Operational Risk and Asset Protection in the Face of Extreme Weather, Large Scale Solar USA, Austin, TX, May 2023.
18. Straight-line Wind-based Hazard Analysis under Future Return Periods, EFCOG Nuclear & Facility Safety Annual Workshop, Albuquerque, NM, March 2023.
17. Extreme Weather Drivers during Power Outages & Equity Considerations for Future Grid Expansions Planning in the United States, Vanderbilt University, January 2023.
16. Extreme Weather Drivers during Power Outages in the United States, Cornell University, November 2022.
15. Projecting Water Scarcity Across Scales: Case Study of the Colorado River Basin, Sandia Loves Science, Virtual, October 2022.
14. Panelist, Powering Environmental Justice with Clean Energy, RE+ 2022, Anaheim, CA, September 2022.
13. Projecting Water Scarcity Across Scales: Case Study of the Colorado River Basin, Southern Plains Drought Early Warning System Partners Meeting, Virtual, August 2022.
12. Panelist, The Water, Climate, and Energy Nexus: Charting the Role of DOE's Technology Offices, Frontiers in Hydrology Workshop, Virtual, June 2022.
11. Extreme Weather Risk to PV Performance and Operations, Large Scale Solar, Austin, TX, June 2022.
10. PV+Storage Operations and Maintenance Considerations, PV Reliability Workshop, Virtual, February 2022.
9. A Tale of Two Models: Projecting Water Scarcity for the Colorado River Basin, AGU Fall Meeting, Virtual, December 2021.

8. Panelist, PV Magazine Roundtables: Optimizing systems and hardware to meet environmental and performance challenges, Virtual, November 2021.
7. Estimating Weather Impacts on Utility-Scale Photovoltaic Plant Performance, Bay Area Research Slam 2021, Virtual, October 2021.
6. Weather Impacts On Utility-Scale Photovoltaic Plant Performance, Materials and Structural Systems Division, National Institute of Standards and Technology, Virtual, October 2020.
5. Reusing Operations & Maintenance Records: Moving from Reactive to Proactive Management of Solar Photovoltaic Sites, Sandia National Laboratories Emeritus Meeting Early-Career Technical Showcase, Albuquerque, NM, March 2020.
4. Multi-Site Assessment of Extreme Weather Impacts on PV Plant Performance and Reliability, PV Reliability Workshop. Lakewood, CO, February 2020.
3. Climate Shocks, Agriculture and Trade, Civil and Environmental Engineering Department, Massachusetts Institute of Technology, October 2019.
2. Global Gridded Crop Specific Agricultural Areas from 1961-2014, Civil, Materials, and Environmental Engineering Department, University of Illinois at Chicago, February 2019.
1. Global Gridded Crop Specific Agricultural Areas from 1961-2014, Energy Water Systems Integration Department, Sandia National Laboratories, January 2019.

## Invited Workshop Participation

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5. US Department of Energy/Water Power Technologies Office & Pacific Northwest National Laboratory Resilience of Energy and Water Systems Workshop, Alexandria, Virginia, 13-14 May 2025
4. US Department of Energy/Office of Science/Biological and Environmental Research Workshop for Accelerating AI for (EESM) modeling, College Park, Maryland, 13 December 2024
3. US Department of Energy/Office of Science/Biological and Environmental Research Roundtable for Fundamental Energy Research Enabled by Artificial Intelligence, Gaithersburg, Maryland, 7-8 November 2024
2. Integrated Hydro-Terrestrial Modeling (IHTM) 2.0, Reston, Virginia, 31 October 2023 - 02 November 2023 ([report](#))
1. SIAM Convening on Climate Science, Sustainability, and Clean Energy, Tysons Corner, Virginia, 10-12 October 2022. ([report and contributed recommendation](#))

## Contributed Presentations

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† – presentation by mentee

### Oral Presentations

43. **N.D. Jackson** and D. Coyle, Spatio-Temporal Modeling of Compound Threats to Power Systems Using Conditional Random Fields, Society for Industrial and Applied Mathematics Conference on Optimization (OP26), Edinburgh, Scotland, 2026.
42. **N.D. Jackson**, Water and Economic Development: Thinking Across Sectors, 2026 Water Leaders Workshop, Ruidoso, NM, 2026.

41. W.G. Chapman<sup>†</sup>, J.D. Smith, C. Teeter, and **N.D. Jackson**. Graph Reservoir Networks for Prediction of Spatiotemporal Systems, 2026 Neuro Inspired Computational Elements Conference, Atlanta, Georgia, 2026.
40. **N.D. Jackson**, Extreme Weather Events, Prediction, and Impacts, Sandia National Laboratories and the Energized Watershed, (virtual), January 2026.
39. **N.D. Jackson**, A. Sharma, J.K. Skolfield. Spatio-Temporal Modeling of Weather-related Compound Threats to Power Systems Using Markov Random Fields, IEEE Resilience Week, National Harbor, MD. 2025.
38. **N.D. Jackson**, T. Gunda, K.L. Bonney, and S. Ferencz. From Data to Decisions: Machine Learning for Water Allocation Amid Hydrologic Extremes, Workshop on Human Water Use, Decision Making, and Earth Systems Modeling, Boulder, CO, October 2025.
37. W. Chapman<sup>†</sup> (speaker), J.D. Smith, J. Mott, C. Teeter, and **N.D. Jackson**. Graph Reservoir Networks for Prediction of Spatiotemporal Systems. Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DS25), Denver, CO, May 2025.
36. J.D. Smith (speaker), W. Chapman, and **N.D. Jackson**. Predictor Sensitivity and Variable Importance in Drought Forecasting. Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DS25), Denver, CO, May 2025.
35. **N.D. Jackson**, A. Sharma, J.K. Skolfield, T. Gunda. Transitional States During Compound Extreme Events: Examples from Cascading Wildfires and Floods. Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DS25), Denver, CO, May 2025.
34. A. Sharma<sup>†</sup> (speaker), **N.D. Jackson**, J.K. Skolfield, and T. Gunda. Joint Statistical Clustering of Spatio-temporal Weather Data to Predict Wildfires, APS March Meeting, Anaheim, CA, March 2025.
33. **N.D. Jackson**, W. Chapman, J.D. Smith, C. Teeter, J. Mott, L. Scuderi, Z. Strasberg. Machine Learning and Reservoir Computing for Watershed-Scale Drought Prediction, AGU Fall Meeting, Washington, D.C., December 2024.
32. **N.D. Jackson**, T. Gunda, K.L. Bonney, S. Ferencz. Machine Learning for Water Allocation Amid Hydrologic Extremes: Case Study of the Colorado River Basin in Texas, AGU Fall Meeting, Washington, D.C., December 2024.
31. **N.D. Jackson**, T. Gunda, K.L. Bonney, S. Ferencz. From Data to Decisions: Machine Learning for Water Allocation Amid Hydrologic Extremes, DOE EESM PI Meeting, Bethesda, MD, August 2024.
30. **N.D. Jackson**. Bringing DEI into R&D spaces: examples from Sandia National Laboratories, Society for Industrial and Applied Mathematics Annual Meeting (AN24), Spokane, WA, July 2024.
29. **N.D. Jackson**, T. Gunda, R. Valdez. Modeling Water Intersections with Climate Security: Reconciling Multi-Sectoral Priorities in an Arid Region, WaterSciCon2024, St. Paul, MN, June 2024.
28. **N.D. Jackson**. Defining Extreme: Case Studies from the Electric Grid., Society for Industrial and Applied Mathematics Conference on the Mathematics of Planet Earth (MPE24), Portland, OR, June 2024.
27. **N.D. Jackson**, R. Valdez, W. Peplinski, and T. Gunda. Water for Energy: Complex Data Requirements across New Mexico Users, 2024 New Mexico Water Data Workshop, Albuquerque, NM, May 2024.
26. **N.D. Jackson**, . Extreme Weather and Natural Hazard Impacts to Grid Operations: A Focus on Utility-Scale Solar, American Meteorological Society – 15th Conference on Weather, Water, Climate, and the New Energy Economy, Baltimore, MD, January 2024.

25. **N.D. Jackson** Panelist with Rebecca Reck, Stephanie Gillespie, and Yanfen Li “Navigating changes to early career trajectories in academia” (panel), Society of Women Engineers Annual Meeting (we23), Los Angeles, CA, October 2023.
24. **N.D. Jackson** and H. Mendoza. Explainable Model Reduction to Predict Temperature Impacts, Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DS23), Portland, OR, May 2023.
23. **N.D. Jackson**, P. Johnson, J. Yu, H. Baroud, A. Staid, and J-P Watson. Extreme Weather Drivers during Power Outages in the United States, American Meteorological Society – 14th Conference on Weather, Water, Climate, and the New Energy Economy, Denver, CO, January 2023.
22. **N.D. Jackson**, A. Miara, F. Corsi, D. Vignoles, H.H. Bokhari, N.S. Rao, B.M. Fekete, H.I. Jager, C.J. Vörösmarty. Flood risk to power generation in the United States, AGU Fall Meeting, Chicago, IL, December 2022.
21. **N.D. Jackson**, A. Staid, H. Baroud, P. Johnson, J-P. Watson, and J. Yu. Extreme Weather Drivers During Power Outages in the United States, Society for Risk Analysis Annual Meeting, Tampa, FL, December 2022.
20. M.D. Caballero<sup>†</sup> (speaker), J. Mott, A. Staid, and **N.D. Jackson**. Risks of Reductionism: Comparing Climate and Equity Methodologies for Interdisciplinary Energy Justice Research, Society for Risk Analysis Annual Meeting, Tampa, FL, December 2022.
19. **N.D. Jackson** with J. Desai, A. Walker, and A. Qusaibaty. Understanding Utility-Scale Solar and Storage Operations and Maintenance Cost Drivers. pv magazine webinar. Virtual. December 2022.
18. **N.D. Jackson**, N. Gayoso, T. Gunda, J. Desai, and A. Walker. Operations and Maintenance Considerations for PV+ Storage and Manufacturers, DuraMat Early Career Scientists Seminar Series, Virtual, April 2022.
17. **N.D. Jackson**, V.C. Tidwell, N. Voisin, and J. Yoon. Do We Really Trust Projections of Water Scarcity: Case Study of the Colorado River Basin, American Meteorological Society Annual Meeting, Virtual, January 2022.
16. **N.D. Jackson**, A. Staid, J-P Watson, H. Baroud, and J. Yu. Characterization of Extreme Weather Events During Large-Scale Power Outages, Society for Risk Analysis Annual Meeting, Virtual, December 2021.
15. **N.D. Jackson**, T. Gunda, and A. Staid, Weather Impacts On Utility-Scale Photovoltaic Plant Performance, eLightning presentation, AGU Fall Meeting, Virtual, December 2020.
14. A. Miara (speaker), J. Macknick, H. Jager, V.C. Tidwell, B.M. Fekete, N. Rao, F. Corsi, C.J. Vörösmarty, **N.D. Jackson**, and S. Cohen, Water Risk for the Bulk Power System: Asset to Grid Impacts, AGU Fall Meeting, Virtual, December 2020.
13. **N.D. Jackson**, Evaluation of Extreme Weather Impacts on Utility-scale Photovoltaic Plant Performance, DuraMat Early Career Scientists Seminar Series, Virtual, October 2020.
12. **N.D. Jackson**, Multi-site Assessment of Extreme Weather Impacts on PV Plant Performance and Reliability, Sandia National Laboratories 2020 Earth Science Symposium, Virtual, May 2020.
11. **N.D. Jackson**, T. Gunda, Incorporating Compound Weather Events into Utility-scale PV Performance Estimates, PV Performance Modeling Collaborative Workshop, Salt Lake City Utah, May 2020, NOTE: Cancelled due to COVID-19.
10. **N.D. Jackson**, M. Konar, P. Debaere, and J. Sheffield, Global Climate Shocks to Agriculture from 1961 to 2014, eLightning presentation, AGU Fall Meeting, San Francisco, CA, December 2019.

9. M. Konar (speaker) and **N.D. Jackson**, Global Gridded Crop Specific Agricultural Areas from 1961-2014. Fall Meeting of the American Geophysical Union. New Orleans, LA, December 2017.
8. **N.D. Jackson**, K.I. Tyler, Y. Li, W. Chen, C. Liu and R. Bhargava. Keeping Current: An Update on the Structure and Evaluation of a Program for Graduate Women Interested in Engineering Academia, ASEE Annual Conference & Exposition, Columbus, Ohio, June 2017.
7. K.I. Tyler (speaker), Y. Li, **N.D. Jackson**, W. Chen, C. Liu and R. Bhargava. Overcoming Difficulties in Research Statement Preparation for the Academic Job Search: Expansion of a Peer-Focused Professional Development Program, ASEE Annual Conference & Exposition, Columbus, Ohio, June 2017.
6. **N.D. Jackson**, M. Konar, and P. Debaere, Global Crop Allocation and Climate Shocks to Agriculture from 1950-2015, Midwest Big Data Hub Machine Learning Workshop, Urbana, IL, April 2017.
5. **N. Jackson**, M. Konar, P. Debaere and J. Sheffield, Global Climate Shocks and Crop Allocation to Agriculture from 1950 - 2015, Civil and Environmental Engineering Department Hydrology Seminar Series, University of Illinois at Urbana-Champaign, January 2017.
4. **N. Jackson**, M. Konar, P. Debaere and J. Sheffield, Global Climate Shocks to Agriculture from 1950 - 2015, AGU Fall Meeting. San Francisco, CA, December 2016.
3. **N.D. Jackson**, Climate Change and Drought in Marcala, Honduras, Rotary International Vocational Technical Training workshop to Agua y Desarrollo Comunitario, Marcala, Honduras. August 2015.
2. **N. Jackson**, M. Konar, A.Y. Hoekstra, The Water Footprint of Food Aid, Interdisciplinary Student Summit, Urbana, IL April 2015.
1. **N. Jackson**, Y. Malave, C.L. Roberts-Wollmann (speaker), S. Case, and J. Lesko. Reliability-based Uniform Flexural Resistance Factors for GFRP Reinforced Concrete Members (presentation), Third International Conference in Composites for Construction, Lyon, France, July 2005.

## Poster Presentations

27. **N.D. Jackson**, J.K. Skolfield, and R.M. Alfant<sup>†</sup>. Translating Compound Hazard Risks into Electric Grid Investment Decisions, AGU25, New Orleans, LA, December 2025.
26. R.M. Alfant<sup>†</sup>, J.K. Skolfield, **N.D. Jackson**, and T.R. Edwards. Generation and Transmission Expansion Planning for Resilience to Compound Hazards, IEEE Resilience Week, National Harbor, MD, November 2025.
25. R.L. Valdez, T. Gunda, S.B. Ferencz, and **N.D. Jackson**. Integrated Metrics for System Performance, Attributes, and Critical Threats for Resilience Analysis, IEEE Resilience Week, National Harbor, MD, November 2025.
24. R.L. Valdez, A.G. Moore<sup>†</sup>, **N.D. Jackson**, and T. Gunda. Evaluating Correlations between Risk Indices and Power Outages during Extreme Events, IEEE Resilience Week, National Harbor, MD, November 2025.
23. A.G. Moore<sup>†</sup>, T. Gunda, and **N.D. Jackson**. A Hazard-Informed Empirical Assessment of Floods and Snow Impacts to Utility-Scale Photovoltaic Systems, IEEE Resilience Week, National Harbor, MD, November 2025.
22. T. Gunda, **N.D. Jackson**, and L. Shand. Translation of Climate and Weather Conditions into Energy and Agriculture Sector Risk Assessments. Conference on Data Analysis (CoDA), Santa Fe, NM, February 2025.
21. **N.D. Jackson**, J.K. Skolfield, and A. Sharma. Transitional States during Compound Extreme Events and Power Outages. Conference on Data Analysis (CoDA), Santa Fe, NM, February 2025.

20. W. Chapman<sup>†</sup>, J.D. Smith, C. Mott, and **N.D. Jackson**. Graph Reservoir Networks for Prediction of Spatiotemporal Systems, Conference on Data Analysis (CoDA), Santa Fe, NM, February 2025.
19. **N.D. Jackson**, T. Gunda, S. Dhulipala, and S. Awara. Fusing Insights from Natural Hazards Assessments for Grid Resilience: A Case Study of Reliable Photovoltaics Production, AGU Fall Meeting, San Francisco, CA, December 2023.
18. T. Gunda (speaker), **N.D. Jackson**, K.L. Bonney, S.B. Ferencz. Domain-Informed, Data-Driven Approach to Streamflow Generation and Water Allocations, AGU Fall Meeting, San Francisco, CA, December 2023.
17. **N.D. Jackson**, E. Constantinescu, R. Ghanem, A. Krishnapriyan, R. Lindrup, X. Luo, C. Safta, J-P Watson, W. Xu, S. Yoo, and G. Zhao. Probabilistic Impact Scenarios for Extreme Weather Event Resilience, MultiSector Dynamics Workshop, Davis, CA, October 2023
16. T. Gunda (speaker) and **N.D. Jackson**. Extreme Weather Risks to Water-Energy-Food Nexus: A Summary of Latest Insights and Opportunities, MultiSector Dynamics Workshop, Davis, CA, October 2023
15. S. Gilletly (speaker), **N.D. Jackson**, H. Baroud, P. Johnson, and A. Staid. Extreme Weather Drivers During Large-Scale Power Outages in the United States, Conference on Data Analysis (CoDA), Santa Fe, NM, March 2023.
14. J. Desai (speaker), **N.D. Jackson**, N. Gayoso, T. Gunda, and A. Walker. Operations and Maintenance Considerations for PV+Storage, RE+ 2022, Anaheim, CA, September 2022.
13. H. Mendoza (speaker) and **N.D. Jackson**. Using Machine Learning for Predictive Modeling of Weather Impacts on Utility-scale Photovoltaic Systems, PV Performance Modeling Collaborative (PVPMP), Salt Lake City, UT, July 2022.
12. **N.D. Jackson**, V. Tidwell, N. Voisin, and J. Yoon. Projecting Water Scarcity Across Scales: Case Study of the Colorado River Basin, AGU Chapman Conference, Golden, CO, September 2022.
11. N. Gayoso, **N.D. Jackson** (speaker), T. Gunda, J. Desai, and A. Walker. PV+Storage Operations and Maintenance, 49th IEEE Photovoltaic Specialists (PVSC), Philadelphia, PA, June 2021.
10. S. Gilletly (speaker), **N.D. Jackson** and A. Staid. Quantifying Wildfire-Induced Impacts to Photovoltaic Energy Production in the Western United States, 48th IEEE Photovoltaic Specialists (PVSC), Virtual, June 2021.
9. **N.D. Jackson**, T. Gunda, and A. Staid. Weather Impacts On Utility-Scale Photovoltaic Plant Performance, PV Reliability Workshop, Virtual, February 2021.
8. **N.D. Jackson** and T. Gunda. Reusing Operations & Maintenance Records: Moving from Reactive to Proactive Management of Solar Photovoltaic Sites. Sandia National Laboratories 13<sup>th</sup> Annual Postdoctoral Technical Showcase, Albuquerque, NM, December 2019.
7. **N.D. Jackson** and T. Gunda. Reusing Operations & Maintenance Records: Moving from Reactive to Proactive Management of Solar Photovoltaic Sites, AGU Fall Meeting, San Francisco, CA, December 2019.
6. M. Konar (speaker), **N.D. Jackson**, P. Debaere, and J. Sheffield. Trade openness and climate shocks in agriculture, AGU Fall Meeting, San Francisco, CA, December 2019.
5. J. Kolweier (speaker)<sup>†</sup>, T. Bhole (speaker)<sup>†</sup>, and **N.D. Jackson**. Evaluating FAIRness for Effective Dataset Presentation. University of Illinois at Urbana-Champaign Undergraduate Research Symposium, April 2019.
4. R. von Gnechten (speaker)<sup>†</sup>, M. Konar, **N.D. Jackson**, K. Baylis, P. Anderson, S. Giroux, T.P. Evans, A network analysis of household food sharing in Zambia, AGU Fall Meeting, San Francisco, CA, December 2018.

3. **N. Jackson**, M. Konar, A.Y. Hoekstra, The Water Footprint of Food Aid, AGU Fall Meeting, San Francisco, CA, December 2015.
2. **N. Jackson**, M. Konar, A.Y. Hoekstra. The Water Footprint of Food Aid, Illinois Water Day, Urbana, IL, April 2015.
1. **N. Jackson** and A-P Witmer, The Human-Water Nexus: Effective Engineering Lessons from Fatima, Honduras Water Project, Illinois Water Day, Urbana, IL, April 2015.

## Teaching

8 semesters teaching experience with 3 as an instructor

† – Ranked as outstanding, ‡ – Ranked as excellent

F = Fall, Sp = Spring, Su = Summer

| Role                                              | Course Title                                  | Academic Unit                     | Term                 |
|---------------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------|
| <b>Vanderbilt University</b>                      |                                               |                                   |                      |
| <b>Guest Lecture</b>                              | Energy systems                                | Civil & Environmental Engineering | Sp 2023              |
| <b>Guest Lecture</b>                              | Risk, reliability, and resilience engineering | Civil & Environmental Engineering | Sp 2023              |
| <b>Guest Lecture</b>                              | Data analytics for engineers                  | Civil & Environmental Engineering | Sp 2023              |
| <b>University of Illinois at Urbana-Champaign</b> |                                               |                                   |                      |
| <b>Co-Instructor</b>                              | iEFX Research                                 | College of Engineering            | Su 2018 <sup>†</sup> |
| <b>Co-Instructor</b>                              | Writing in the Engineering Fields             | College of Engineering            | Sp 2018 <sup>†</sup> |
| <b>Teaching Assistant</b>                         | Water Resources Engineering                   | Civil & Environmental Engineering | F 2015               |
| <b>Teaching Assistant</b>                         | Mechanics for MatSE                           | Materials Science & Engineering   | Sp 2014 <sup>‡</sup> |
| <b>Teaching Assistant</b>                         | Thermal-Mech Behavior of Matls                | Materials Science & Engineering   | F 2013               |
| <b>Teaching Assistant</b>                         | Thermal-Mech Behavior of Matls                | Materials Science & Engineering   | F 2012               |
| <b>Virginia Tech</b>                              |                                               |                                   |                      |
| <b>Instructor</b>                                 | Mechanical Behavior of Materials Laboratory   | Engineering Science and Mechanics | Su 2008              |
| <b>Teaching Assistant</b>                         | Engineering Exploration                       | Engineering Education             | F 2007               |

## Mentorship

Provided direct supervision to 4 postdocs, 5 graduate students, and 8 undergraduate students as well as mentored 76 students in 10 training programs

F = Fall, Sp = Spring, Su = Summer

## Direct Supervision

\* – From a demographic under-represented in STEM fields. Home institutions of Sandia National Laboratories interns noted in parentheses.

### Postdocs

|                    |                              |                               |
|--------------------|------------------------------|-------------------------------|
| Rachael M. Alfant* | Sandia National Laboratories | May 2025 – Present            |
| Arjun Sharma       | Sandia National Laboratories | October 2024 – September 2025 |

|                 |                              |                                |
|-----------------|------------------------------|--------------------------------|
| Zachary Kilwein | Sandia National Laboratories | September 2024 – December 2025 |
| William Chapman | Sandia National Laboratories | October 2023 – March 2026      |

**Post-Masters Interns**

|             |                              |                        |
|-------------|------------------------------|------------------------|
| Allen Moore | Sandia National Laboratories | January 2025 – Present |
|-------------|------------------------------|------------------------|

**Graduate Students**

|                      |                                                                |                  |
|----------------------|----------------------------------------------------------------|------------------|
| Joshua Mott          | Sandia National Laboratories<br>(University of North Carolina) | Su2024 – Present |
| Allen Moore          | Sandia National Laboratories (Georgia Tech)                    | Sp2024 – F2024   |
| Mariah Caballero*    | Sandia National Laboratories<br>(Vanderbilt University)        | F2020 – F2023    |
| Natalie Gayoso*      | Sandia National Laboratories (University of New Mexico)        | F2021 – Sp2022   |
| Rachel von Gnechten* | University of Illinois at Urbana-Champaign                     | 2017 – 2019      |

**Undergraduate Students**

|                     |                                                                                                                                    |                 |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Sarah Paik*         | Sandia National Laboratories (Vanderbilt University)                                                                               | Su2022 – F2022  |
| Joshua Mott         | Sandia National Laboratories (University of Florida)                                                                               | Su2020 – Sp2024 |
| Tanvi Bhole*        | University of Illinois at Urbana-Champaign Undergraduate Research Apprenticeship Program (UIUC URAP)                               | Sp2019          |
| Jonathan Kolweier   | UIUC URAP                                                                                                                          | Sp2019          |
| Jacob Povlich       | University of Illinois at Urbana-Champaign Civil & Environmental Engineering Research Experience for Undergraduates (UIUC CEE REU) | Sp2018          |
| Rayan Fadel         | UIUC CEE REU                                                                                                                       | Sp2018          |
| Sajani Gumidyala*   | UIUC CEE REU                                                                                                                       | Sp2016          |
| Namrata Logishetty* | UIUC CEE REU                                                                                                                       | Sp2015          |

**Graduate Committees**

|                   |                                                       |                          |
|-------------------|-------------------------------------------------------|--------------------------|
| Zachary Strasberg | University of New Mexico (Earth & Planetary Sciences) | September 2024 – Present |
|-------------------|-------------------------------------------------------|--------------------------|

**Training Programs**

Note: number of mentees from a demographic under-represented in STEM fields indicated in parentheses

| Role                       | Program                                                                                     | Students | Term   |
|----------------------------|---------------------------------------------------------------------------------------------|----------|--------|
| <b>Professional Mentor</b> | University of Illinois at Urbana-Champaign Mechanical Science & Engineering Senior Capstone | 4 (1)    | F2025  |
| <b>Professional Mentor</b> | University of Illinois at Urbana-Champaign Mechanical Science & Engineering Senior Capstone | 11 (0)   | Sp2025 |
| <b>Professional Mentor</b> | University of Illinois at Urbana-Champaign Mechanical Science & Engineering Senior Capstone | 4 (0)    | F2024  |

|                             |                                                                                                                                                                            |        |                |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------|
| <b>Professional Mentor</b>  | University of Illinois at Urbana-Champaign Mechanical Science & Engineering Senior Capstone                                                                                | 5 (3)  | F2023          |
| <b>Professional Mentor</b>  | Florida International University College of Engineering & Computing Senior Design                                                                                          | 5 (4)  | F2021 – Sp2022 |
| <b>Research Team Leader</b> | Summer Research Opportunities Program (SROP) & Incubating a New Community of Leaders Using Software, Inclusion, Innovation, Interdisciplinary and Open-Science (INCLUSION) | 12 (8) | Su2019         |
| <b>Research Team Leader</b> | SROP & INCLUSION                                                                                                                                                           | 11 (7) | Su2018         |
| <b>Research Team Leader</b> | SROP & INCLUSION                                                                                                                                                           | 10 (6) | Su2017         |
| <b>Research Team Leader</b> | SROP                                                                                                                                                                       | 8 (8)  | Su2016         |
| <b>Research Team Leader</b> | SROP                                                                                                                                                                       | 6 (6)  | Su2009         |

## Service to the Profession

### Appointed or Elected Leadership

|                                         |                                                                                                                                                      |                |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Committee Member</b>                 | National Academies Committee on “Attribution of Extreme Weather and Climate Events and their Impacts”                                                | 2024 – 2026    |
| <b>Associate Editor</b>                 | Earth's Future                                                                                                                                       | 2023 – Present |
| <b>Guest Associate Editor</b>           | Earth's Future Special Collection “Multi-Sector Dynamics: Advancing Complex Adaptive Human-Earth Systems Science in a World of Interconnected Risks” | 2023 – Present |
| <b>Advisory Panel Member</b>            | Environmental Research Letters                                                                                                                       | 2023 – 2024    |
| <b>Chair</b>                            | Natural Hazards Section Student and Early Career Committee, AGU                                                                                      | 2023 – 2025    |
| <b>Scientific Steering Group Member</b> | MultiSector Dynamics Community of Practice                                                                                                           | 2022 – Present |
| <b>Steering Committee Member</b>        | Hazards Equity Working Group of the Natural Hazards Section, AGU                                                                                     | 2020 – 2022    |
| <b>Board of Directors</b>               | Akelos                                                                                                                                               | 2016 – 2018    |
| <b>Membership Chair</b>                 | Student Division, ASEE                                                                                                                               | 2015 – 2016    |

### Committee Membership Involvement

|               |                                                                    |                   |
|---------------|--------------------------------------------------------------------|-------------------|
| <b>Member</b> | Membership Committee, SIAM                                         | 2023 – 2024       |
| <b>Member</b> | Natural Hazards Section Student and Early Career Committee, AGU    | 2019 – Present    |
| <b>Member</b> | Earth & Space Science Informatics Honors Canvassing Committee, AGU | 2019 – 2020, 2024 |

### Conference Organization Involvement

|                     |                                                                                                            |      |
|---------------------|------------------------------------------------------------------------------------------------------------|------|
| <b>Co-Convener</b>  | Multisector Dynamics: Understanding Extreme Weather, Compound Hazards, and Their Impacts, AGU Fall Meeting | 2025 |
| <b>Co-Chair</b>     | Multisector Dynamics: Advances in Modeling Adaptive Human Systems, AGU Fall Meeting                        | 2025 |
| <b>Co-Organizer</b> | Contemporary Approaches in Conceptual Climate Modeling, SIAM Dynamical Systems Conference                  | 2025 |

|                                    |                                                                                                                                               |                |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Co-Chair</b>                    | Multisector Dynamics: Extreme Weather, Compound Hazards, and Impacts on Society, AGU Fall Meeting                                             | 2023           |
| <b>Organizing Committee Member</b> | SIAM-Mathematics of the Planet Earth Conference 2024                                                                                          | 2023 – 2024    |
| <b>Co-Organizer</b>                | MultiSector Dynamics (MSD) Workshop                                                                                                           | 2023           |
| <b>Co-Coordinator</b>              | Outstanding Student Presentation Awards for the Natural Hazards Section, AGU Fall Meeting                                                     | 2022           |
| <b>Co-Convener</b>                 | Early Career Researcher as an Identity—Unifying Our Understandings and the Implications of Doing So, AGU Fall Meeting                         | 2022           |
| <b>Co-Convener</b>                 | Geohazards and Society: Striving Towards Improved Natural Hazards Resilience for All, AGU Fall Meeting                                        | 2022           |
| <b>Co-Convener</b>                 | Resilience of Energy Systems, SRA Annual Meeting                                                                                              | 2022           |
| <b>Co-Organizer</b>                | Student & Early Career Conference, AGU Fall Meeting                                                                                           | 2019 – 2022    |
| <b>Co-Convener</b>                 | PV+Storage, PV Reliability Workshop                                                                                                           | 2022           |
| <b>Judge</b>                       | Outstanding Student Paper Award, AGU Fall Meeting                                                                                             | 2021           |
| <b>Co-Convener</b>                 | Student & Early Career Voices at AGU, AGU Fall Meeting                                                                                        | 2021           |
| <b>Co-Convener</b>                 | Resilience Modeling of Energy Systems - Parts I/II, SRA Annual Meeting                                                                        | 2021           |
| <b>Reviewing Activities</b>        |                                                                                                                                               |                |
| <b>Selection Committee</b>         | Becoming Everything You Are Awards (formerly Black Engineer of the Year Awards)                                                               | 2024 – Present |
| <b>Reviewer</b>                    | Sandia National Laboratories Laboratory Directed Research & Development Earth Science Research Foundation                                     | 2024           |
| <b>Reviewer</b>                    | NASA MUREP Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering And Science (MUREP INCLUDES) | 2024           |
| <b>Reviewer</b>                    | Water Resources Research                                                                                                                      | 2024           |
| <b>Reviewer</b>                    | NASA Earth Science Division - Early Career Investigator Program                                                                               | 2023           |
| <b>Reviewer</b>                    | Journal of Open Source Software                                                                                                               | 2023 – Present |
| <b>Conference Reviewer</b>         | Photovoltaic Specialists Conference                                                                                                           | 2023 – Present |
| <b>Reviewer</b>                    | Journal of Hydrology                                                                                                                          | 2022 – Present |
| <b>Reviewer</b>                    | Progress in Energy                                                                                                                            | 2022 – Present |
| <b>Reviewer</b>                    | Environmental Research Communications                                                                                                         | 2022 – Present |
| <b>Reviewer</b>                    | Artificial Intelligence for the Earth Systems                                                                                                 | 2022 – Present |
| <b>Panel Reviewer</b>              | U.S. Department of Energy Office of Science                                                                                                   | 2022           |
| <b>Reviewer</b>                    | Earth's Future                                                                                                                                | 2021 – Present |
| <b>Conference Reviewer</b>         | IEEE Resilience Week                                                                                                                          | 2021 – Present |

|                            |                                |                |
|----------------------------|--------------------------------|----------------|
| <b>Reviewer</b>            | Environmental Research Letters | 2016 – Present |
| <b>Conference Reviewer</b> | ASCE Annual Convention         | 2015 – 2022    |

### Membership in Professional Societies

|                                                       |                |
|-------------------------------------------------------|----------------|
| Society for Risk Analysis (SRA)                       | 2021 – Present |
| American Meteorological Society (AMS)                 | 2021 – Present |
| American Society for Civil Engineers (ASCE)           | 2015 – Present |
| American Geophysical Union (AGU)                      | 2014 – Present |
| Society of Women Engineers (SWE)                      | 2014 – Present |
| American Society for Engineering Education (ASEE)     | 2014 – Present |
| Society for Industrial and Applied Mathematics (SIAM) | 2008 – Present |
| American Concrete Institute (ACI)                     | 2004 – 2008    |

## National Laboratory, University, and Community Service

### Sandia National Laboratories Service

|                            |                                                                                                              |                |
|----------------------------|--------------------------------------------------------------------------------------------------------------|----------------|
| <b>Supplemental Mentor</b> | Security top Academic Research & Talent at Historically Black Colleges and Universities Program (START HBCU) | 2024 – Present |
| <b>Member</b>              | Analytics for Climate and Earth Sciences (ACES) Data Working Group                                           | 2022 – Present |
| <b>Planning Member</b>     | ACES Community of Practice (CoP)                                                                             | 2021 – Present |
| <b>Core Member</b>         | Electric Grid CoP                                                                                            | 2020 – 2023    |

### University of Illinois at Urbana-Champaign Campus Service

|                                         |                                                                                                                          |           |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Laboratory Assistant</b>             | Girls' Adventure in Mathematics (GAMES), Engineering and Science Environmental Engineering and Sustainability (EES) Camp | 2019      |
| <b>Interdisciplinary Representative</b> | Department of Civil and Environmental Engineering Graduate Student Advisory Committee                                    | 2017–2019 |
| <b>Instructor</b>                       | Worldwide Youth in Science & Engineering Camp Engineering Ethics session                                                 | 2017–2018 |
| <b>Chair</b>                            | Engineering Graduate Student Advisory Committee                                                                          | 2017-2018 |
| <b>Vice Chair</b>                       | Campus Student Election Commission                                                                                       | 2016–2017 |
| <b>President</b>                        | ASEE Student Chapter                                                                                                     | 2016–2017 |
| <b>Co-Coordinator</b>                   | Illinois Female Engineers in Academia Training                                                                           | 2015–2018 |
| <b>Alumni Mentor</b>                    | Honduras Water Project                                                                                                   | 2015–2018 |
| <b>Student Member, Secretary</b>        | Campus Student Election Commission                                                                                       | 2015–2016 |
| <b>Camp Co-Coordinator</b>              | GAMES EES Camp                                                                                                           | 2014–2017 |
| <b>Publicity Chair</b>                  | ASEE Student Chapter                                                                                                     | 2014–2015 |
| <b>Student Member</b>                   | LGBT Resource Center Advisory Committee                                                                                  | 2014-2015 |
| <b>Student Consultant on Teaching</b>   | College of Engineering                                                                                                   | 2013-2019 |

### Virginia Tech Campus Service

|                                  |                                                            |                        |
|----------------------------------|------------------------------------------------------------|------------------------|
| <b>Panelist</b>                  | Graduate Honor System                                      | 2007–2008<br>2004–2005 |
| <b>Department Representative</b> | College of Engineering Graduate Student Advisory Committee | 2004–2005              |

### Community

|                                  |                                                                                               |                |
|----------------------------------|-----------------------------------------------------------------------------------------------|----------------|
| <b>Co-Founder</b>                | Strategic Preparation for Academic Resilience and Know-how                                    | 2021 – Present |
| <b>Co-Organizer</b>              | Scientific Olympiad's Write It Do It Event, Albuquerque, NM                                   | 2020           |
| <b>Land Use Fellow</b>           | MIT Climate CoLab                                                                             | 2017–2018      |
| <b>Energy-Water Nexus Fellow</b> | MIT Climate CoLab                                                                             | 2017           |
| <b>Waste Management Fellow</b>   | MIT Climate CoLab                                                                             | 2016           |
| <b>Member</b>                    | Mali Water Project                                                                            | 2015–2016      |
| <b>Volunteer Judge</b>           | FIRST LEGO League of Illinois                                                                 | 2013–2017      |
| <b>Mentor</b>                    | University of Illinois Laboratory High School                                                 | 2013           |
| <b>Reviewer</b>                  | Martin Luther King Jr. Creative Expressions Competition                                       | 2013           |
| <b>Volunteer</b>                 | Awesome Ladies Preparing for High Achievement Program, Jefferson Middle School, Champaign, IL | 2008           |
| <b>Volunteer Judge</b>           | FIRST LEGO League of Virginia                                                                 | 2004–2005      |

## Selected Media

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‡ – Interview with N. D. Jackson

\* – Interview with co-author with coverage of collaborative work

### Profiles, Panels, and Invited Commentary

5. University of Illinois at Urbana-Champaign: “Women in Statistics and Data Science Panel highlights career perspectives and practical advice” by Aaron Thompson, 21 October 2025 ([link](#)).
4. Society for Industrial and Applied Mathematics: “MPE24 Panel Explores Mathematical Careers in Earth Science and Sustainability” by Jillian Kunze, 01 October 2024 ([link](#)).
3. Sandia Lab News: “Five Sandia Labs scientists earn 2024 Black Engineer of the Year Awards”, 28 February 2024 ([link](#)).
2. ‡ Society for Risk Analysis Podcasts – Let’s Talk Risk: “All Things Extreme Weather Events: Outages, Patterns, Restoration, & More” by Ben Rachunok, 22 March 2022 ([link](#)).
1. Sandia Lab News: “Sandia Shines in Inaugural Bay Area Postdoctoral Research SLAM” by Amy Treece, 10 December 2021 ([link](#)).

### Press coverage of research on weather impacts to solar energy

5. \* The Weather Channel Storm Center: “Solar Panels and Storms: How Do They Hold Up”, 06 November 2023.
4. Ars Technica: “The Stormy Relationship Between Solar Power and the Weather” by Doug Johnson, 14 September 2021 ([link](#)).
3. PV Magazine: “Measuring Impacts on Solar Performance, Whatever the Weather” by Mark Hutchins, 01 September 2021 ([link](#)).
2. Sandia Lab News: “Sandia Uncovers Hidden Factors That Affect Solar Farms During Severe Weather” by Mollie Rappe, 27 August 2021.
1. Additional coverage appeared in *Meteorological Technology International*, *Environmental News Network*, *Tech Xplore*, and other outlets (2021).