

# DAVID RICHARD JOHNSON

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## Associate Professor of Industrial Engineering & Political Science

### Purdue University

290 Grissom Hall

315 N Grant Street

West Lafayette, IN 47907-2023

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## PRIOR APPOINTMENTS

### Assistant Professor of Industrial Engineering & Political Science

Purdue University

West Lafayette, Indiana

2015-2023

### Adjunct Mathematician

RAND Corporation

Santa Monica, California

2015-2021

### Associate Mathematician

RAND Corporation

Santa Monica, California

2013-2015

### Assistant Policy Analyst

RAND Corporation

Santa Monica, California

2008-2013

### Core Faculty Member

Pardee RAND Graduate School

Santa Monica, California

2013-2015

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## EDUCATION

### Pardee RAND Graduate School

Ph.D., Policy Analysis

Dissertation: "Improving Flood Risk Estimates and Mitigation Policies In Coastal Louisiana  
Under Deep Uncertainty"

Santa Monica, California

2013

### University of Cambridge

Master of Advanced Study (MASt), Mathematics

Cambridge, England, UK

2005

### North Carolina State University

B.S., Mathematics (Physics minor)

Raleigh, North Carolina

2003

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## HONOURS AND AWARDS

### Purdue Outstanding Engineering Teachers

Purdue University

2020, 2021, 2022

### Seed for Success Award (for external sponsored awards over \$1 million)

Purdue University

2017, 2019, 2022

### Cazier Dissertation Award in Sustainability

Pardee RAND Graduate School

2010

### Outstanding Teaching Assistant Award

Pardee RAND Graduate School

2010

### RAND Impact Award

RAND Corporation

2009, 2011

### Gates Cambridge Scholar

University of Cambridge, UK

2004

## PUBLICATIONS AND PAPERS

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### Journal Articles and Book Chapters

N. Nguyen, **D. Johnson**. 2024. "The impacts of local wind power objection on the power system of the Midwestern Independent System Operator area." In press at *Energy*, doi:10.1016/j.energy.2024.130727.

S. Zuidema, J. Liu, M. Chepeliev, **D. Johnson**, U. Lantz Baldos, S. Froking, C. Kucharik, W. Wollheim, T. Hertel. 2023. "US climate policy yields water quality co-benefits in the Mississippi Basin and Gulf of Mexico." *Proceedings of the National Academy of Sciences* **120**(43), e2302087120. doi:10.1073/pnas.2302087120. (first four authors are 'co-lead authors')

**D. Johnson**. 2023. "Defence against the rising seas." *Nature Climate Change* (invited commentary, not peer reviewed). doi:10.1038/s41558-023-01645-0.

J. Wang, **D. Johnson**. 2023. "Incorporating Learning into Direct Policy Search for Flood Risk Management." *Risk Analysis*, **44**(1): 190-202. doi:10.1111/risa.14136.

**D. Johnson**, N. Geldner, J. Liu, U. Lantz Baldos, T. Hertel. 2023. "Reducing US Biofuels Requirements Mitigates Short-term Impacts of Global Population and Income Growth on Agricultural Environmental Outcomes." *Energy Policy* **175**(April 2023), 113497.

**D. Johnson**, S. Polasky, J. Ricker-Gilbert. 2023. "Policy collision: a framework to identify where polycentric, multi-objective sustainability solutions are needed." *Environmental Research Letters*, **18**(2): 025004. doi:10.1088/1748-9326/acb0e4.

F. Chen, A. Subedi, M. Jahanshahi, **D. Johnson**, E. Delp. 2022. "Deep Learning-based Building Attribute Estimation from Google Street View Images for Flood Risk Assessment Using Feature Fusion and Task Relation Encoding." *ASCE Journal of Computing in Civil Engineering*, **36**(6): 04022031; 1-23. doi:10.1061/(ASCE)CP.1943-5487.0001025.

**D. Johnson**, J. Wang, N. Geldner, A. Zehr. 2022. "Rapid, Risk-Based Levee Design Framework to Achieve Greater Risk Reduction at Lower Cost than Standards-Based Design." *Journal of Flood Risk Management* **2022**, e12786;1-11. doi:10.1111/jfr3.12786.

G. Villarini, W. Zhang, P. Miller, **D. Johnson**, L. Grimley, H. Roberts. 2021. "Probabilistic Rainfall Generator for Tropical Cyclones Affecting Louisiana." *International Journal of Climatology*, **42**(3): 1789-1802. doi:10.1002/joc.7335.

**D. Johnson**. 2021. "Integrated Risk Assessment and Management Methods are Necessary for Effective Implementation of Natural Hazards Policy." *Risk Analysis*, **41**(7), 1240-1247. doi:10.1111/risa.13268.

**D. Johnson**, S. Sun, A. Huang, T. Hertel. 2021. "Quantifying the Impact of Biomass Co-Firing on Greenhouse Gas Emissions from Coal-Powered Electricity Generation." *International Journal of Environmental Science and Technology*, **19**(5): 3469-3480. doi:10.1007/s13762-021-03493-x.

V. Schull, S. Mehan, M. Gitau, **D. Johnson**, S. Singh, J. Sesmero, D. Flanagan. 2021. "Construction of Critical Periods for Water Resources Management and Their Application in the FEW Nexus." *Water* **2021**, 13(5), 718. doi:10.3390/w13050718.

**D. Johnson**, C.A. Blain, A. Bobet, J. Browning, B. Edge, B. Holmes, M. LaChance, J. Ramirez, I. Robertson, T. Smith, C. Thompson, K. Vielma, D. Zehner, D. Zuo. 2020. "The Network Coordination Office of NHERI (Natural Hazards Engineering Research Infrastructure)." *Frontiers in Built Environment*, special issue on "Natural Hazards Engineering Research Infrastructure (NHERI) 2016-2020: Mitigating the Impact of Natural Hazards on Civil Infrastructure and Communities." doi:10.3389/fbuil.2020.00108.

M. Shisler, **D. Johnson**. 2020. "Comparison of Methods for Imputing Non-Wetting Storm Surge to Improve Hazard Characterization." *Water*, 12(5), 1420, Special Issue on "Recent Advances and New Directions in Flood Forecasting, Modeling, and Mapping." doi: 10.3390/w12051420.

L. Zanotti, Z. Ma, J. Johnson, **D. Johnson**, D. Yu, M. Burnmore, C. Carothers. 2020. "Sustainability, Resilience, Adaptation, and Transformation: Tensions and Plural Approaches." *Ecology and Society*, 25(3), Art. 4. doi:10.5751/ES-11642-250304.

J. Fischbach, **D. Johnson**, D. Groves. 2019. "Flood Damage Reduction Benefits and Costs in Louisiana's 2017 Coastal Master Plan." *Environmental Research Communications*, 1(2019): 111001. doi:10.1088/2515-7620/ab4b25.

M. Meyer, **D. Johnson**. 2019. "Variability of Best-Estimate Flood Depth Return Periods in Coastal Louisiana." *Journal of Marine Science and Engineering*. Special Issue, "Coastal Hazards Related to Water." 2019(7), 145. doi:10.3390/jmse7050145.

**D. Johnson**, N. Geldner. 2019. "Contemporary Decision Methods for Agricultural, Environmental, and Resource Management and Policy." *Annual Review of Resource Economics*, 11: 19-41. doi: 10.1146/annurev-resource-100518-094020.

**D. Johnson**. 2019. "Improved Methods for Estimating Flood Depth Exceedances within Hurricane Protection Systems." *Risk Analysis*, 39(4): 890-905. doi:10.1111/risa.13213.

V. Mijares, M. Gitau, **D. Johnson**. 2018. "A Method for Assessing and Predicting Water Quality Status for Improved Decision-Making and Management." *Water Resources Management*, Oct 2018. pp. 1-14. doi: 10.1007/s11269-018-2113-3.

J. Johnson, L. Zanotti, Z. Ma, D. Yu, **D. Johnson**, A. Kirkham, C. Carothers. 2018. "Interplays of sustainability, resilience, adaptation and transformation." In Handbook of Sustainability and Social Science Research, eds. W.L. Filho, J. Callewaert, R. Marans. New York City: Springer.

J. Fischbach, **D. Johnson**, K. Kuhn. 2016. "Bias and Efficiency Tradeoffs in the Selection of Storm Suites Used to Estimate Flood Risk." *Journal of Marine Science and Engineering*. Special Issue: "Coastal Hazards Related to Storm Surge."

**D. Johnson**, A. Curtright, H. Willis. 2013. "Identifying Key Drivers of Greenhouse Gas Emissions from Biomass Feedstocks for Energy Production." *Environmental Science & Policy*, 33(11): 109-119. doi: 10.1016/j.envsci.2013.05.003.

**D. Johnson**, J. Fischbach, D. Ortiz. 2013. "Estimating Surge-Based Flood Risk with the Coastal Louisiana Risk Assessment Model," *Journal of Coastal Research*. Special Issue 67: 109-126. doi: 10.2112/SI\_67\_8.

A. Curtright, **D. Johnson**, H. Willis, T. Skone. 2012. "Scenario Uncertainties in Estimating Direct Land-Use Change Emissions in Biomass-to-Energy Life Cycle Assessment," *Biomass & Bioenergy*, 47(12): 240-249. doi: 10.1016/j.biombioe.2012.09.037.

**D. Johnson**, H. Willis, A. Curtright, C. Samaras, T. Skone. 2011. "Incorporating Uncertainty Analysis into Estimates of Life Cycle Greenhouse Gas Emissions from Biomass Production," *Biomass & Bioenergy*, 35(7): 2619-2626. doi: 10.1016/j.biombioe.2011.02.046.

### **Refereed Conference Proceedings**

**D. Johnson**, N. Geldner. 2023. "Alternative Risk Metrics to Evaluate Tradeoffs between Efficiency and Equity of Risk Reduction." *14<sup>th</sup> International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP14*. Dublin, Ireland. July 9-13, 2023.

N. Geldner, **D. Johnson**, G. Villarini, B. Yuill, A. Saharia, S. Zou, L. Grimley, N. Young, M. McManus, H. Roberts, S. Misra. "Applied Joint Probabilistic Modeling of Compound Coastal Flood Hazard: An Extension of the Joint Probability Method with Optimal Sampling." *14<sup>th</sup> International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP14*. Dublin, Ireland. July 9-13, 2023.

**D. Johnson**, N. Geldner, J. Liu, U. Lantz-Baldos, T. Hertel. 2022. "Reducing US Biofuels Requirements Mitigates Short-term Impacts of Global Population and Income Growth on Agricultural Environmental Outcomes." *25th Annual Conference on Global Economic Analysis*. Global Trade Analysis Project: virtual (originally Kigali, Rwanda). June 8-10, 2022.

F. Chen, M. Jahanshahi, **D. Johnson**, E. Delp. 2019. "Vision-based Decision Support for Flood Risk Assessment Using Google Street View Images." In *Structural Health Monitoring 2019*, F. Chang, A. Guemes, F. Kopsaftopoulos, eds. Proceedings of the *Twelfth International Workshop on Structural Health Monitoring*. Stanford, California. September 10-12, 2019.

**D. Johnson**, S. Sun, A. Huang, T. Hertel. "Quantifying the Impact of Biomass Co-Firing on GHG Emissions from Coal-Powered Electricity Generation." *2018 Agricultural & Applied Economics Association (AAEA) Annual Meeting*. Washington, D.C.: August, 2018.

A. Mahalingam, **D. Johnson**, U. Ozmel. "Hierarchical and Modular Organization in Strategic Networks." *Strategic Management Society (SMS) 27<sup>th</sup> Annual Conference*. Houston, TX: October, 2017.

J. Johnson, A. Kirkham, L. Zanolli, D. Yu, **D. Johnson**, C. Carothers, M. Burnham, Z. Ma. "Interplay between sustainability, resilience, adaptation, and transformation." *Sustainability and Social Science Research Symposium*. University of Michigan, May 17-19, 2017.

### **Peer- and Externally-Reviewed Technical Reports**

I. Robertson, A. Bobet, B. Edge, W. Holmes, **D. Johnson**, M. LaChance, J. Ramirez. 2023. "Natural Hazards Engineering Research Infrastructure Science Plan: Multi-Hazard Research to Make a More Resilient World." 3rd Edition. DesignSafe-CI. doi:[10.17603/ds2-abbs-0966](https://doi.org/10.17603/ds2-abbs-0966). (authors listed alphabetically other than lead author Robertson)

J. Fischbach, **D. Johnson**, J. Wang, S. Hemmerling, Z. Cobell, O. Diaz. 2023. "2023 Coastal Master Plan: 50-Year FWOA Model Output, Regional Summaries – Risk, Attachment C3." Version 3. 277 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

**D. Johnson**, J. Fischbach, P. Kane, J. Wang, M. Wilson. 2023. "2023 Coastal Master Plan: Future with Master Plan Outputs, Regional Summaries – Risk, Attachment C6." Version 2. 60 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

**D. Johnson**, J. Fischbach, N. Geldner, M. Wilson, C. Story, J. Wang. 2023. "2023 Coastal Master Plan: CLARA Model Summary, Attachment C11." Version 3. 31 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

M. Wilson, J. Fischbach, **D. Johnson**, J. Wang, P. Kane, N. Geldner, A. Littman. 2023. "2023 Coastal Master Plan: Nonstructural Risk Reduction Evaluation Results, Attachment E3." Version 3. 36 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

**D. Johnson**, J. Fischbach, N. Geldner, M. Wilson, C. Story, J. Wang. 2023. "2023 Coastal Master Plan: CLARA Model Summary, Attachment E4." Version 2. 33 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, P. Kane, A. Littman, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. "2023 Coastal Master Plan: Historic Storm Run – Ike, Supplemental Material H6.1." Version 2. 29 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, P. Kane, A. Littman, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. "2023 Coastal Master Plan: Historic Storm Run – Rita, Supplemental Material H6.2." Version 2. 29 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, P. Kane, A. Littman, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. "2023 Coastal Master Plan: Historic Storm Run – Barry, Supplemental Material H6.3." Version 2. 28 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, P. Kane, A. Littman, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. "2023 Coastal Master Plan: Historic Storm Run – Ida, Supplemental Material H6.4." Version 2. 28 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, P. Kane, A. Littman, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. "2023 Coastal Master Plan: Historic Storm Run – Isaac, Supplemental Material H6.5." Version 2. 28 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

S. Hemmerling, I. Georgiou, Z. Cobell, O. Diaz, J. Fischbach, **D. Johnson**, J. Wang. 2023. “2023 Coastal Master Plan: Restoration Impacts on Surge and Risk – Coastal Forests, Attachment H6.7.” Version 2. 67 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

**D. Johnson**, N. Geldner, H. Roberts, B. Yuill, N. Young. 2021. “Louisiana Watershed Initiative: Transition Zone Analysis – Recurrence Analysis.” Baton Rouge, Louisiana: The Water Institute of the Gulf.

H. Roberts, B. Yuill, N. Young, A. McCorquodale, L. Grimley, G. Villarini, **D. Johnson**, N. Geldner. 2021. “Louisiana Watershed Initiative: Transition Zone Analysis – Production Run Development and Simulation.” Baton Rouge, Louisiana: The Water Institute of the Gulf.

B. Yuill, **D. Johnson**, N. Geldner, N. Young. 2021. “Louisiana Watershed Initiative: Compound Flood Transition Zone Amite River Pilot Study Overview.” Baton Rouge, Louisiana: The Water Institute of the Gulf.

**D. Johnson**, J. Fischbach, N. Geldner. 2021. “2023 Coastal Master Plan: Methods Summary, Coastal Louisiana Risk Assessment Model.” Version I. 26 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

**D. Johnson**, N. Geldner. 2021. “2023 Coastal Master Plan: Model Improvement Report, Storm Selection for the Integrated Compartment Model.” Version I. 9 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

J. Fischbach, **D. Johnson**, M. Wilson, N. Geldner, C. Stelzner. 2021. “2023 Coastal Master Plan: Model Improvement Report, Risk Assessment.” Version I. 76 pgs. Baton Rouge, Louisiana: Coastal Protection and Restoration Authority.

Fischbach, J., **D. Johnson**, E. Molina-Perez. “Reducing Coastal Flood Risk with a Lake Pontchartrain Barrier.” RR-1988. Santa Monica, CA: RAND Corporation, July 2017.

J. Fischbach, **D. Johnson**, K. Kuhn, M. Pollard, C. Stelzner, R. Costello, E. Molina-Perez, R. Sanchez, J. Syme, H. Roberts, Z. Cobell. “2017 Coastal Master Plan Modeling: Attachment C3-25 – Storm Surge and Risk Assessment.” Baton Rouge, Louisiana: LA Coastal Protection and Restoration Authority, Apr 2017.

D. Groves, K. Kuhn, J. Fischbach, **D. Johnson**, J. Syme. “Analysis to Support Louisiana’s Flood Risk and Resilience Program and Application to the National Disaster Resilience Competition.” RR-1449-CPRA. Santa Monica, CA: RAND Corporation, Jan 2016.

J. Fischbach, **D. Johnson**, E. Molina-Perez. “Lake Pontchartrain Surge Barrier: Preliminary Estimates of Risk Reduction and Inducement of Flooding from Proposed Alignments.” PR-2175-CPRA. Santa Monica, CA: RAND Corporation, Nov 2015.

**D. Johnson**, J. Fischbach, K. Kuhn. “Current and Future Flood Risk in Greater New Orleans.” In *The New Orleans Index at Ten Collection*, ed. Allison Plyer. The Data Center. New Orleans, Louisiana, Aug 2015.

N. Powell, H. Zhao, S. Zou, H. Roberts, D. Resio, **D. Johnson**, R. Clark. “Project Development and Implementation Program: Upper Barataria Basin Risk Reduction Modeling Phase 2 – Rainfall and Storm Surge Combined Effects Modeling.” The Water Institute of the Gulf. Baton Rouge, Louisiana, July 2015.

H. Roberts, **D. Johnson**, R. Clark. “Project Development and Implementation Program: Upper Barataria Basin Risk Reduction.” The Water Institute of the Gulf. Baton Rouge, Louisiana, March 2014.

D. Groves, J. Fischbach, D. Knopman, **D. Johnson**, K. Giglio. “Strengthening Coastal Planning: How Coastal Regions Could Benefit from Louisiana’s Planning and Analysis Framework.” RR-437. Santa Monica, CA: RAND Corporation, Feb 2014.

D. Groves, E. Bloom, **D. Johnson**, D. Yates, V. Mehta. “Addressing Climate Change in Local Water Agency Plans: Demonstrating a Simplified Robust Decision Making Approach in the California Sierra Foothills.” RR-491-CEC. Santa Monica, CA: RAND Corporation, Oct 2013.

**D. Johnson.** “Improving Flood Risk Estimates and Mitigation Policies In Coastal Louisiana Under Deep Uncertainty.” RGSD-315. Santa Monica, CA: RAND Corporation, Aug 2013.

J. Fischbach, **D. Johnson**, D. Ortiz, B. Bryant, M. Hoover, J. Ostwald. 2012. *Coastal Louisiana Risk Assessment Model: Technical Description and 2012 Coastal Master Plan Analysis Results*. TR-1259-CPRA. Santa Monica, CA: RAND Corporation.

J. Fischbach, **D. Johnson**, D. Ortiz, B. Bryant, M. Hoover, J. Ostwald. “Appendix D-25: Risk Assessment (CLARA) Model Technical Report,” prepared for the Coastal Protection and Restoration Authority of Louisiana. Jan 2012.

A. Curtright, H. Willis, **D. Johnson**. “Documentation for the Calculating Uncertainty in Biomass Emissions Model, version 2.0 (CUBE v2.0): Contents and Use,” prepared for the National Energy Technology Laboratory, US Department of Energy. Nov 2011.

N. Kalra, O. Younossi, K. Kamarck, S. Al-Dorani, G. Cecchine, A. Curtright, C. Feng, A. Litovitz, **D. Johnson**, M. Makki, S. Nataraj, D. Ortiz, P. Roshan, C. Samaras. *Recommended Research Priorities for the Qatar Foundation's Environment and Energy Research Institute*. MG-1106-QF. Santa Monica, CA: RAND Corporation, 2011.

## PAPERS UNDER REVIEW

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N. Geldner, **D. Johnson**, J. Doss-Gollin, K. Keller. “Efficient Flood Risk Mitigation and Intersectional Equity Implications in New Orleans.” Submitted to *PLOS-One*.

N. Nguyen, **D. Johnson**. “The impacts of local wind power objection on the power system of the Midwestern Independent System Operator area.” Under review at *Energy*.

K. Best, Q. He, A. Flores, D. Gu, J. Howell, **D. Johnson**, Y. Liao, A. Reilly, A. Rumbach, T. Sheldon, A.R. Siders, G. Wong-Parodi, R. Young, D. Niemeier. “Bridging community resilience and local fiscal planning for climate justice.” Submitted to *Science*.

M. Ahmadi, **D. Johnson**. “Prediction of storm surge on evolving landscapes under climate change.” Submitted to *npg Natural Hazards*.

## SELECTED GRANTS/CONTRACTS

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**Summary:** Since joining Purdue in 2015, Dr. Johnson has been awarded \$8.4M in grants/contracts in either a PI or co-PI role. \$2.5M of that total is as lead PI (\$1M as the sole investigator), and \$6.4M of it comes from federally competitive funding programs. Including awards as Senior Personnel, Dr. Johnson has been involved in projects totaling \$33.3M (\$31.3M federal).

### National Science Foundation:

2016 - \$4,100,000 – NHERI Network Coordination Office (Sr Personnel)

2019 - \$2,500,000 – INFEWS/T2: Identifying Sustainability Solutions through Global-Local-Global Analysis of a Coupled Water-Agriculture-Bioenergy System (Co-PI)

2021 - \$5,051,000 – NHERI Network Coordination Office (Sr Personnel)

2021 - \$15,000,000 – HDR Institute: Geospatial Institute for Digital Innovation to Enhance Resilience and Sustainability (Sr Personnel)

2022 - \$200,000 – RAPID: Drinking Water System Contamination Response and Recovery Following the 2021 Colorado Wildfires (Sr Personnel)

2022 - \$742,343 – SAI-R: Reducing Natural Hazards Risks by Incorporating Community Impacts and Equity (PI)

2023 - \$500,000 – CAREER: Risk-Based Methods for Robust, Adaptive, and Equitable Flood Risk Management (PI)

2023 - \$403,756 – Agent-based Modeling of Incentives to Encourage Pre-disaster Relocation in Anticipation of Coastal Flooding (co-PI, retroactively added to award to PI Vicki Bier (UW-Madison) from 2020; responsible for \$83,446)

### US National Academies of Science, Engineering, and Medicine:

2022 – \$299,913 - Incorporating Equity and Social Vulnerability into the Design of Flood Risk Mitigation Strategies (PI)

**US Department of Defense:**

2021 – \$1,218,000 - Development of a Decision Support Aid System Connecting Climate Model Downscaling and DoD Infrastructure (Co-PI)

**Louisiana Coastal Protection and Restoration Authority:**

2013 – \$1,267,945 - CLARA Development for the 2017 Master Plan (Sr Personnel)

2019 – \$52,948 - Environmental Science Consulting Services – Risk Assessment, Nuisance Flooding, and ICM Storm Simulator (PI, Sole Investigator)

2020 – \$59,977 - Phase 2 Model Updates and Improvements – Risk Assessment (PI, Sole Investigator)

2020 – \$209,141 - Phase 3 Model Runs – Risk Assessment (PI, Sole Investigator)

2023 - \$102,604 – 2029 Coastal Master Plan Risk Model Improvements (PI)

**Louisiana Office of Community Development:**

2021 – \$69,399 - Louisiana Watershed Initiative Transition Zone Coincident & Recurrence Analysis, Structure Inventory Phase 1 (PI, Sole Investigator)

2021 – \$217,696 - Louisiana Watershed Initiative Structure Inventory Phase 2 (PI)

**The Water Institute of the Gulf:**

2013 – \$93,237 - Barataria Basin Risk Reduction Evaluation (PI)

2014 – \$38,139 - Barataria Basin Risk Reduction Joint Rainfall Analysis (PI)

**Andrew W. Mellon Foundation:**

2017 – \$134,755 - Decision Support for Flood Risk Mitigation (PI)

2017 – \$149,816 - Global Temperature Goals to Avoid Climate Tipping Points (Co-PI)

**US Department of the Army:**

2021 – \$497,000 - Cornerstone OTA – Supply Chain Awareness Continuing Education (Co-PI)

**Environmental Defense Fund:**

2017 – \$10,000 - Preliminary Analysis of Restoration Impacts on Risk Reduction to Industry (PI)

**Purdue University:**

2017 – \$320,124 - Managing the Global Commons – Sustainable Agriculture and Use of the World's Land and Water Resources in the 21<sup>st</sup> Century (Co-PI)

**SELECTED PRESENTATIONS****Invited Talks**

**D. Johnson.** “Making an Impact: Contributing to the Policy Process as a Researcher.” Invited webinar for the Society for Risk Analysis (virtual). October 11, 2023.

**D. Johnson.** “The 2023 Coastal Master Plan.” Keynote plenary for *ADCIRC Users Group Meeting 2023*, Baton Rouge, Louisiana. June 8, 2023.

**D. Johnson.** “Making a Difference: Lessons from Louisiana’s Coastal Master Plan.” Keynote lecture for *19th Purdue Geotechnical Workshop*. West Lafayette, Indiana. May 5, 2023.

**D. Johnson.** “Flood Risks, Impacts, and Resilience Planning – Lessons from Louisiana.” Panel presentation on “Indiana’s Flood Future: Maps, Mitigation & Next Steps.” 5th Annual Indiana Water Summit. (virtual) May 6, 2022.

**D. Johnson.** “What Informing Policy Looks Like.” Keynote and panel moderator. *Maximize Your Impact: Informing Policy as an Academic in STEM*. Purdue Policy Research Institute. April 29, 2022.

**D. Johnson.** “Multi-Model, Multi-Fidelity Framework for Quantifying Compound Flood Hazard.” *U.S. Army Corps of Engineers Engineering Research & Development Center (ERDC) ERDC-University-Agency Collaboration Symposium* (virtual). August 24-26, 2021.

**D. Johnson.** “Deep Learning-Based Building Attribute Estimation for Flood Risk Assessment.” *U.S. Army Corps of Engineers Engineering Research & Development Center (ERDC) ERDC-University-Agency Collaboration Symposium* (virtual). August 24-26, 2021.

**D. Johnson.** “Equity Considerations in Flood Risk Management.” Panel on “Conflict, Disaster &

Climate Change.” *Symposium on Next Steps - Environmental Justice, Climate Change & Racial Justice*. Purdue University. West Lafayette, IN. March 25-26, 2021.

**D. Johnson.** “The Evolution of Flood Risk Management in Coastal Louisiana: a Decade of Decision Support.” *Cornell University Environmental and Water Resources Engineering seminar series*. Ithaca, NY. October 10, 2019.

**D. Johnson.** “Regional Challenges and Opportunities for Sustainability, Vulnerability, and Adaptation to Climate Change.” (Opening keynote plenary.) *1st International Meeting: UNAM-ASU Binational Laboratory of Sustainability, Vulnerability, and Adaptation to Climate Change*. Merida, Mexico. June 11-13, 2019.

**D. Johnson, J. Fischbach.** “Connecting Systems Model Design to Decision-Maker and Stakeholder Needs: Lessons from Louisiana’s Coastal Master Plan.” *American Geophysical Union 2017 Fall Meeting*. Session on Water and Society: Water Resources Management and Policy in a Changing World. New Orleans, LA. December 11-15, 2017. (I was the invited speaker for this talk, but J. Fischbach presented for me due to conflict with Society for Risk Analysis conference noted in the contributed talks below.)

**D. Johnson.** Invited panel with I. S. Wing (chair), T. Wong, K. Riahi. “Challenges in Coupling Sectoral Models.” *Workshop on Modeling Integrated Energy-Water-Land Systems Dynamics*. Sponsored by Stanford Energy Modeling Forum. Snowmass, CO. July 18-21, 2017.

**D. Johnson.** “Joint Probability Methods for Estimating Storm Surge Flood Risk: Applications in Coastal Louisiana.” *Purdue University Hydrology and Hydraulics Seminar Series*. West Lafayette, IN. February 14, 2017.

J. Fischbach, **D. Johnson**, K. Kuhn. “An Updated Coastal Louisiana Risk Assessment (CLARA) Model to Estimate Flood Depths, Damage, and Risk Reduction Project Benefits.” *State of the Coast 2016*. New Orleans, LA. June 1-3, 2016.

**D. Johnson.** “Assessing the Potential for Cost-Effective Nonstructural Risk Reduction in Coastal Louisiana.” *State of the Coast 2014*. New Orleans, LA. Mar 18-20, 2014.

**D. Johnson, R. Lempert.** “Addressing Uncertainty and Stakeholder Values in Infrastructure Risk Management.” *Eastern Coastal Infrastructure and Climate Change: Science, Impacts, Planning, and Response Conference*. Washington, D.C. Feb 25-28, 2014.

**D. Johnson.** “Predicting Coastal Flood Risk in an Uncertain Future: Lessons from Louisiana’s 2012 Master Plan.” *Eastern Coastal Infrastructure and Climate Change: Science, Impacts, Planning, and Response Conference*. Washington, D.C. Feb 25-28, 2014.

**D. Johnson.** “Decision-Making under Uncertain Climate.” *Urban Flood Risk Management Technical Workshop*. Sponsored by the World Bank, for China’s Ministry of Water Resources. Beijing, China. Dec 10-11, 2013.

**D. Johnson.** “Heuristic Optimization of Biofuels Production Scenarios That Meet U.S. Renewable Fuel Standards.” *2013 Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*. Minneapolis, MN. Oct 6-9, 2013.

**D. Johnson, J. Fischbach.** “Cost-Effective and Robust Strategies for Nonstructural Flood Risk Reduction in Coastal Louisiana.” *2013 Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*. Minneapolis, MN. Oct 6-9, 2013.

**D. Johnson, J. Fischbach.** “Informing Sea-Level Rise Adaptation Decisions in Coastal Louisiana under Deep Uncertainty.” *Energy Modeling Forum Workshop on Climate Change Impacts and Integrated Assessment (CCI/IA)*. Snowmass, CO. July 22-Aug 2, 2013.

J. Fischbach, **D. Johnson**, D. Ortiz. “Application of the Coastal Louisiana Risk Assessment (CLARA) Model to Predict Project Performance.” *State of the Coast 2012*. New Orleans, LA. June 25-27, 2012.

### **Contributed Talks / Other (presented by first author)**



**D. Johnson.** “Multi-Model Joint Probability Method for Estimating Compound Flood Risk.” *Society for Risk Analysis 2021 Annual Meeting*. Virtual. December 6-8, 2021.

**D. Johnson.** “The Evolution of Coastal Flood Risk Management in Louisiana: A Decade of Decision Support.” *Society for Risk Analysis 2021 Annual Meeting*. Virtual. December 6-8, 2021.

**D. Johnson.** “Multi-model joint probability method for estimating compound flood risk.” *NOAA 2021 Coastal & Ocean Community Modeling Workshop*. Virtual. October 19-21, 2021.

J. Wang, **D. Johnson**, N. Geldner, A. Zehr. “An Efficient Model to Inform Risk-Based Levee Design Standards.” *State of the Coast 2021*. New Orleans, LA. June 2-4, 2021.

**D. Johnson**, J. Wang, N. Geldner, A. Zehr. “An Efficient Approach to Robust, Risk-Informed Levee Design Standards.” *Society for Risk Analysis 2020 Annual Meeting*. Virtual. December 13-16, 2020.

**D. Johnson**, M. Meyer. “Natural Variability of Best-Estimate Coastal Flood Depth Return Periods.” *Society for Risk Analysis 2019 Annual Meeting*. Washington, DC. December 9-11, 2019.

**D. Johnson.** “Flood Risk Reduction Benefits of Coastal Restoration and Green Infrastructure Projects.” *Society for Risk Analysis 2019 Annual Meeting*. Washington, DC. December 9-11, 2019.

**D. Johnson**, Z. Richardson, S. Sierra, Z. Chen. “Robust Funding Allocations for Nonstructural Flood Risk Mitigation in Louisiana’s Coastal Zone.” *Society for Risk Analysis 2018 Annual Meeting*. New Orleans, LA. December 2-6, 2018.

T. Sahan, F. Chen, M. Jahanshahi, E. Delp, **D. Johnson.** “Homeowner-Level Decision Support System for Mitigating Coastal Flood Risk in Louisiana.” *Society for Risk Analysis 2018 Annual Meeting*. New Orleans, LA. December 2-6, 2018.

**D. Johnson**, J. Fischbach, D. Groves. “Benefit-Cost Analysis of Flood Risk Reduction Measures in Louisiana’s 2017 Coastal Master Plan.” *Society for Risk Analysis 2018 Annual Meeting*. New Orleans, LA. December 2-6, 2018.

N. Ishinabe, **D. Johnson.** “Environmental Justice Implications of Flood Risk Management Policies in Louisiana.” *Society for Risk Analysis 2018 Annual Meeting*. New Orleans, LA. December 2-6, 2018.

M. Shisler, **D. Johnson.** “Improving Storm Surge Hazard Characterization Using ‘Pseudo-Surge’ to Augment Hydrodynamic Simulation Outputs.” *Society for Risk Analysis 2018 Annual Meeting*. New Orleans, LA. December 2-6, 2018.

**D. Johnson**, Z. Richardson, S. Sierra, M. Shisler. “Multi-Objective Analysis of Funding Allocations for Nonstructural Flood Risk Mitigation in Coastal Louisiana.” *Annual Meeting of the Decision-Making under Deep Uncertainty (DMDU) Society*. Santa Monica, CA: November 13-15, 2018.

**D. Johnson**, S. Sun, A. Huang, T. Hertel. “Quantifying the Impact of Biomass Co-Firing on GHG Emissions from Coal-Powered Electricity Generation.” *2018 Agricultural & Applied Economics Association (AAEA) Annual Meeting*. Washington, D.C.: August 5-7, 2018.

V. Mijares, M. Gitau, **D. Johnson.** “Development and Improvement of Water Quality Index.” *39th Annual Indiana Water Resources Association (IWRA) Symposium*. Bloomington, IN. June 27-29, 2018.

T. Sahan, **D. Johnson.** “Digital Tools to Promote Nonstructural Mitigation.” *State of the Coast 2018*. New Orleans, LA. May 30-June 1, 2018.

**D. Johnson**, J. Fischbach. “Flood Risk and Damage Assessment for Louisiana’s 2017 Coastal Master Plan.” *State of the Coast 2018*. New Orleans, LA. May 30-June 1, 2018.

**D. Johnson**, J. Fischbach, D. Groves. “Risk Reduction Benefits and Costs from Louisiana’s 2017 Coastal Master Plan.” *State of the Coast 2018*. New Orleans, LA. May 30-June 1, 2018.

**D. Johnson**, J. Fischbach, K. Kuhn. “Storm surge-based flood risk in coastal Louisiana: impacts of Louisiana’s 2017 coastal Master Plan and methods for uncertainty propagation.” *Society for Risk Analysis 2017 Annual Meeting*. Arlington, VA: Dec 10-14, 2017.

- D. Johnson**, Z. Chen. “Estimating the Potential for Cost-Effective Nonstructural Flood Risk Reduction in Coastal Louisiana.” *INFORMS Annual Meeting*. October 22-25, 2017.
- D. Johnson**, J. Fischbach, K. Kuhn. “Current and Future Flood Risk in Greater New Orleans.” *State of the Coast 2016*. New Orleans, LA. June 1-3, 2016.
- N. Powell, H. Roberts, H. Zhao, S. Zou, D. Resio, **D. Johnson**, R. Clark. “Integrating Storm Surge and Rainfall Flood Hazards in Upper Barataria.” *State of the Coast 2016*. New Orleans, LA. June 1-3, 2016.
- H. Roberts, J. Atkinson, J. Fischbach, **D. Johnson**. “Feasibility of Storm Surge Protection for Lake Pontchartrain.” *State of the Coast 2016*. New Orleans, LA. June 1-3, 2016.
- J. Fischbach, D. Groves, **D. Johnson**, C. Sharon. “Flood Risk Reduction Benefits and Costs in Louisiana’s 2012 Coastal Master Plan.” *2014 Society for Risk Analysis Annual Meeting*, Denver, CO. Dec 7-10, 2014.
- D. Johnson**, J. Fischbach, H. Willis. “Addressing Uncertainty and Public Values in Infrastructure Risk Management.” *Transportation Hazards and Security Summit*. Irvine, CA. Aug 19-23, 2013.
- J. Fischbach, **D. Johnson**, D. Ortiz. “Applying the Coastal Louisiana Risk Assessment Model to Assess Long-Term Benefits from Flood Risk Reduction Projects.” *9<sup>th</sup> INTECOL International Wetlands Conference*. Orlando, FL. June 3-8, 2012.
- D. Johnson**, J. Fischbach, D. Groves, C. Sharon. “Protecting and Restoring Louisiana’s Coast: RAND’s Contribution to Louisiana’s Comprehensive Master Plan for a Sustainable Coast.” *Climate Adaptation Futures: Second International Climate Change Adaptation Conference 2012*. Tucson, AZ. May 29-31, 2012.
- D. Johnson**, J. Fischbach, D. Ortiz, N. Burger. “Assessing Long-Term Flood Risks to Coastal Louisiana Under Deep Uncertainty.” *2011 Society for Risk Analysis Annual Meeting*. Charleston, SC. Dec 4-7, 2011.
- H. Willis, D. Groves, J. Fischbach, **D. Johnson**, L. Andrews. “Reducing New Orleans Storm-Surge Flood Risk in an Uncertain Future.” *2011 Society for Risk Analysis Annual Meeting*. Charleston, SC. Dec 4-7, 2011.

## TEACHING EXPERIENCE

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### Purdue University

Decision-Making under Deep Uncertainty (IE69000): Spring 2022, 2024  
 Engineering Economic Analysis (IE54500): Fall 2020-2023  
 Coastal Flood Risk Modeling (IE49000/69000): Spring 2019  
 Secure Operations (IE59000): Spring 2019, 2021; Fall 2020-2023  
 Policy Analysis of Flood Risk (IE49500): Spring 2018  
 Engineering Economics (IE34300): Spring 2016-2019  
 Quantitative Analysis for Climate Change Adaptation (IE59000/POL52000): Fall 2015-2018; Spring 2021, 2023

### Pardee RAND Graduate School (Instructor)

Computing Tools for Exploratory and Robustness Analysis: Fall 2013, Winter 2014

### Pardee RAND Graduate School (Teaching Assistant)

Empirical Analysis 1: Fall 2009, 2010, 2011  
 Advanced Econometrics 2/3: Spring 2011  
 Microeconomics 2: Winter 2010  
 Microeconomics 1: Fall 2009

## **SERVICE AND PROFESSIONAL INVOLVEMENT**

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### **Member:**

Society for Risk Analysis (SRA):

Vice-Chair, Engineering and Infrastructure Specialty Group, 2020-21

Chair, Engineering and Infrastructure Specialty Group, 2021-22

Member, Program Planning Committee for annual meeting, 2022-24

Decision-Making under Deep Uncertainty (DMDU) Society

### **Peer Reviewer:**

*Advances in Water Resources, Applied Energy, ASCE Journal of Infrastructure Systems, Biomass & Bioenergy, Climatic Change, Environmental Science & Technology, Environment and Planning B: Urban Analytics and City Science, Environmental Modelling & Software, Geoscientific Model Development, INFORMS Journal of Optimization, Journal of Industrial Ecology, Journal of Infrastructure Systems, Journal of Marine Science and Engineering, Nature Climate Change, Nature Communications, Remote Sensing, Risk Analysis, Safety Science, Water, Water Resources Research*

Review Panelist, National Science Foundation: 2018, 2021 (x2), 2023 (programs omitted for confidentiality)

Review Panelist, Indiana Water Resources Research Center: 2018

Review Panelist, NOAA New York Sea Grant Program: 2017

### **NSF Natural Hazards Engineering Resilient Infrastructure program's Network Coordination Office:**

Lead for social sciences and policy outreach, 2016-present

Author of 3<sup>rd</sup> edition NHERI Science Plan

Organizing committee, 2024 NHERI Summit, May 14-15, 2024 at University of Maryland

### **Purdue University:**

Search Committee, Political Science (Policy faculty): 2015-2016

Ad-hoc Committee for Undergrad Certificate in Environmental & Sustainability Studies: 2015-2016

Churchill and Gates Cambridge Scholarship Advisory Board: 2016-2018

Facilities Committee, Industrial Engineering: 2016-2017

Search Committee, Political Science (Causal Inference faculty): 2017

Search Committee, Center for the Environment (Director): 2018

Search Committee, Industrial Engineering (Professor of Practice): 2021

Search Committee, Industrial Engineering (Production Systems faculty): 2021

Search Committee, Political Science (Sr Environmental Politics faculty): 2021

Search Committee, Political Science (Environmental Politics faculty): 2022

Search Committee, Industrial Engineering (broad area search): 2023-24

### **Pardee RAND Graduate School:**

Admissions Committee: 2014, 2015

Search Committee for Assistant Dean: 2013

Student Representative, Faculty Committee on Curriculum and Appointments: 2010-2011

### **University of Cambridge:**

Alumni Ambassador for Southern California, Gates Cambridge Scholarships: 2009-2011

### **North Carolina State University:**

Park Scholarships Regional Selection Committee & Semi-Finalist Interviewer: 2011-2016, 2021

Caldwell Fellows Selection Committee: 2013

### **American Association for the Advancement of Science:**

Evaluator, Emerging Leaders in Science and Society program: 2013, 2014