Vivek Srikrishnan

CONTACT INFORMATION

Earth and Environmental Systems Institute
Pennsylvania State University
State College, PA 16802 USA

E-mail: vivek@psu.edu
WWW: personal.psu.edu/vxs914
Phone: (814) 865-5007

RESEARCH INTERESTS

- Climate change risk management and adaptation
- Coupled natural-human systems
- Complex system dynamics
- Decision-making under uncertainty
- Risk analysis and uncertainty quantification

CURRENT APPOINTMENT

Assistant Research Professor, Pennsylvania State University — March 2019 to present
Earth and Environmental Systems Institute

Visiting Assistant Professor, Cornell University — October 2020 to present
Department of Biological & Environmental Engineering

PREVIOUS APPOINTMENTS

Postdoctoral Scholar, Pennsylvania State University — February 2018 to March 2019
Earth and Environmental Systems Institute

EDUCATION

- Ph.D., Energy and Mineral Engineering, Pennsylvania State University, 2018
- M.S., Energy and Mineral Engineering, Pennsylvania State University, 2015
- B.S., Mathematics, University of Illinois at Urbana-Champaign, 2004
- B.A., Philosophy, University of Illinois at Urbana-Champaign, 2004

PEER-REVIEWED PUBLICATIONS

[12] F. C. Errickson, W. D. Collins, K. Keller, **V. Srikrishnan**, and D. Anthoff, "Improving the climate model calibration reduces the social cost of methane," *Nature* (conditionally accepted).

[11] K. Keller, C. Helgeson, and **V. Srikrishnan**, "Climate Risk Management," invited contribution to *Annual Review of Earth and Planetary Sciences* (forthcoming).

[10] C. Helgeson, **V. Srikrishnan**, K. Keller, and N. Tuana (2020), "Why simpler computer simulation models can be epistemically better for informing decisions," *Philosophy of Science* (accepted). Preprint: https://philpapers.org/rec/HELWSC-3.

[9] M. Zarekarizi, **V. Srikrishnan**, and K. Keller (2020), "Neglecting uncertainties biases house-elevation decisions to manage riverine flood risks," *Nature Communications* 11:5361. DOI: 10.1038/s41467-020-19188-9.

[8] **V. Srikrishnan**, R. Alley, and K. Keller (2019), "Investing in Science and Using the Results to Improve Climate Risk Management," *Eos*, 100, DOI: 10.1029/2019EO131077.

[7] K. L. Ruckert, **V. Srikrishnan**, and K. Keller (2019), "Characterizing the deep uncertainties surrounding coastal flood hazard projections: A case study for Norfolk, VA," *Scientific Reports* 9, 11373. DOI: 10.1038/s41598-019-47587-6.

[6] T. E. Wong, A. Klufas, **V. Srikrishnan**, and K. Keller (2018), "Neglecting model structural uncertainty underestimates upper tails of flood hazard," *Environmental Research Letters* 13 (7). DOI: 10.1088/1748-9326/aacb3d.

[5] J. Morris, **V. Srikrishnan**, M. Webster, and J. Reilly (2018), "Hedging strategies: electricity investment decisions under policy uncertainty," *The Energy Journal* 39 (1). DOI: 10.5547/01956574.39.1.jmor.

[4] P. .C. Oddo, B. S. Lee, G. G. Garner, **V. Srikrishnan**, P. .M. Reed, C. E .Forest, and K. Keller (2017), "Deep uncertainties in sea-level rise and storm surge projections: Implications for coastal flood risk management," *Risk Analysis*. DOI: 10.1111/risa.12888.

[3] T. E. Wong, **V. Srikrishnan**, D. Hadka, and K. Keller (2017), "A multi-objective decision-making approach to the journal submission problem," *PLOS ONE*. DOI: 10.1371/journal.pone.0178874.

[2] **V. Srikrishnan**, G. S. Young, and J. R. S. Brownson (2017), "Skill and skill prediction of cloud-track advection-only forecasting under a cumulus-dominated regime," *Journal of Applied Meteorology and Climatology* 56 (3), 651–665. DOI: 10.1175/JAMC-D-16-0224.1.

[1] **V. Srikrishnan**, G. S. Young, L. Witmer, and J. R. S. Brownson (2015), "Using multi-pyranometer arrays and neural networks to estimate direct normal irradiance," *Solar Energy* 119, 531–542. DOI: 10.1016/j.solener.2015.06.004.

Manuscripts Under Review or Submitted

[2] **V. Srikrishnan**, Y. Guan, R. S. J. Tol, and K. Keller, "Highest CO_2 emissions scenarios are extreme given observations and expert judgements," *Nature Climate Change* (resubmitted after revision).

[1] **V. Srikrishnan** and K. Keller, "Small increases in agent-based model complexity can result in large increases in required calibration data," *Environmental Modeling & Software* (resubmitted after revision). Preprint: https://arxiv.org/abs/1811.08524.

Conference Proceedings

[1] **V. Srikrishnan**, J. R. S. Brownson, and G. S. Young. "The All-Seeing Eye: Using Multi-Pyranometer Arrays and Neural Networks to Estimate Direct Normal Irradiance." In: *Proceedings of the 43nd American Solar Energy Society Meeting*, San Francisco, CA, July 7–9, 2014.

Invited Talks

[9] "How Likely Are The Most Extreme CO_2 Emissions Scenarios?" MIT Joint Program on the Science and Policy of Global Change Seminar, Remote, August 7, 2020.

[8] "Climate Risk Management: A Decision-Centered Approach," Tufts Civil and Environmental Engineering Department Seminar, Tufts University, Medford (MA), November 15, 2019.

[7] "Adaptive Multi-Objective Robust Decision Making," Carnegie Mellon-Penn State Workshop on Multi-Objective Robust Decision Making, Pennsylvania State University, State College (PA), August 12-13, 2019.

[6] "From Earth System Science to Coastal Hazards and Back," Environmental and Sustainability Seminar, Carnegie Mellon University, Pittsburgh (PA), May 3, 2019 (with Klaus Keller).

[5] "Agent-Based Models: The New 'Plastic' or the Emperor's Clothes?" Program on Coupled Human-Environmental Systems Research Seminar, Penn State, University Park (PA), March 25, 2019 (with Klaus Keller).

[4] "From Earth System Science to Coastal Hazards and Back," Pacific Northwest National Laboratory, Richland (WA), March 14, 2019 (with Klaus Keller)

[3] "From Earth System Science to Coastal Hazards And Back," Joint Global Change Research Institute, College Park (MD), February 15, 2019 (with Klaus Keller).

[2] "Can We Avoid a (Rational Route) to Collapse?," Workshop on Managing Natural Resource Risk in the Modern and Prehistoric World, Santa Fe (NM), October 22, 2018 (with Klaus Keller).

[1] "Hedging Strategies for Electricity Investment Decisions Under Policy Uncertainty," Energy and Mineral Engineering Graduate Seminar, Pennsylvania State University, State College (PA), March 4, 2016.

CONFERENCE TALKS

[3] M. S. Lucash, J. Huang, **V. Srikrishnan**, K. Keller, A. Klippel, R. M. Scheller, R. Nicholas, and E. Smithwick. "Using robust decision-making and virtual reality to analyze management tradeoffs under climate change." *International Association of Landscape Ecologists World Congress*. Milan, Italy, July 2019.

[2] **V. Srikrishnan**, "Validity of Taylor's Hypothesis Across Time Scales: Implications for Solar Forecasting." In: *44nd American Solar Energy Society Meeting*, State College, PA, July 28–30, 2015.

[1] **V. Srikrishnan**, "The All-Seeing Eye: Using Multi-Pyranometer Arrays and Neural Networks to Estimate Direct Normal Irradiance." In: *43nd American Solar Energy Society Meeting*, San Francisco, CA, July 7–9, 2014.

CONFERENCE POSTERS

[10] **V. Srikrishnan**, Y. Guan, R. S. J. Tol, and K. Keller. "Fossil fuel resources, decarbonization, and economic growth are key drivers of feasibility to achieve Paris climate targets." *American Geophysical Union Fall Meeting 2019*, San Francisco, CA, December 9–13, 2019.

[9] T. Wong, **V. Srikrishnan**, B. Vega-Westhoff, F. Errickson, and C. Ledna. "Probabilistic projects for timing of global sea-level thresholds," *American Geophysical Union Fall Meeting 2019*, San Francisco, CA, December 9–13, 2019.

[8] **V. Srikrishnan**, Y. Guan, R. S. J. Tol, and K. Keller. "Fossil fuel resources, decarbonization, and economic growth are key drivers of feasibility to achieve Paris climate targets." *Society for Decision Making Under Deep Uncertainty 2019 Workshop*, Delft, Netherlands, November 6–7, 2019.

[7] **V. Srikrishnan** and K. Keller. "Can We Calibrate and Identify Agent-Based Models of Flood Risk Adaptation?" *American Geophysical Union Fall Meeting 2018*, Washington, DC, December 10–14, 2018.

[6] **V. Srikrishnan** and K. Keller. "Can We Calibrate and Identify Agent-Based Models of Flood Risk Adaptation?" *Society for Decision Making Under Deep Uncertainty 2018 Workshop*, Los Angeles, CA, November 14–15, 2018.

[5] I. Steinke, **V. Srikrishnan**, and K. Keller. "Implications of radiation management for coastal flooding risks — A case study of New Orleans." *European Geophysical Union General Assembly 2018*, Vienna, Austria, April 8–13, 2018.

[4] **V. Srikrishnan**, T.E. Wong, G.G. Garner, and K. Keller. "Combining Remote and Local Observations In A Direct Policy Search for Coastal Flood Defense Under Deep Uncertainty." *Society for Decision Making Under Deep Uncertainty 2017 Workshop*, Oxford, UK, November 14–15, 2017.

[3] C. Spence, J. Salazar, J. Quinn, **V. Srikrishnan**, M. Koszuta, P.M. Reed, and K. Keller. "Quantifying the deep uncertainties surrounding climate impacts on water systems." *Society for Decision Making under Deep Uncertainty 2017 Workshop*, Oxford, UK, November 14–15, 2017

[2] **V. Srikrishnan**, and K. Keller. "Identifying Signposts for Adaptive Flood Risk Management Strategies." *Society for Decision Making Under Deep Uncertainty 2016 Workshop*, Washington, DC, November 16–17, 2016.

[1] **V. Srikrishnan**, G. S. Young, and J. R. S Brownson. "The Error from Taylor's Hypothesis for Solar Forecasting." *Penn State Initiative for Sustainable Electric Power Systems Workshop on Power Systems and Markets*, State College, PA, November 19–20, 2015.

WORKSHOPS ORGANIZED

[1] Carnegie Mellon-Penn State Workshop on Multi-Objective Robust Decision Making, State College (PA), August 12-13, 2019.

GRANTS AND CONTRACTS

[2] 2019–2022, Co-PI (PI Klaus Keller at Penn State on subcontract from Battelle-Pacific Northwest National Laboratory), Integrated Coastal Modeling (ICoM), DOE, $1,200,000.

[1] 2019–2020, Co-PI (PI Klaus Keller at Penn State on subcontract from Battelle-Pacific Northwest National Laboratory), Integrated Multi-sector, Multi-scale Modeling (IM3), DOE, $25,000

NETWORKS AND PROJECTS

[3] 2019–2020, Participant (PI Erica Smithwick), Visualizing Forest Futures (ViFF), NSF

[2] 2018–2021, Participant (PI Karen Fisher-Vanden), Project on Coupled Human and Earth Systems (PCHES), DOE

[1] 2016–2019, Participant (PI Klaus Keller), Network for Sustainable Climate Risk Management (SCRiM), NSF

TEACHING

Pennsylvania State University, State College, PA

Primary Instructor

- **Ordinary Differential Equations.** Linear and nonlinear systems of ordinary differential equations, index theory, bifurcations, applications, dynamical systems, chaos. (Summer 2008, Summer 2010).
- **Ordinary and Partial Differential Equations.** First and second order equations, existence and uniqueness, Laplace transforms, partial differential equations, Fourier series, applications. (Fall 2007, Spring 2008, Spring 2009).
- **Ordinary Differential Equations.** First and second order equations, existence and uniqueness, Laplace transforms. (Fall 2006).
- **Integral Vector Calculus.** Multidimensional analytic geometry, multiple integrals, potential fields. (Spring 2010).
- **Calculus of Several Variables.** Analytic geometry, partial differentiation, parametric functions in space. (Fall 2004, Spring 2006).
- **Calculus with Analytic Geometry II.** Derivatives, integrals, sequences and series, analytic geometry. (Fall 2009).
- **Calculus with Analytic Geometry I.** Limits, derivatives, differentials, integrals. (Spring 2011).
- **Trigonometry and Analytic Geometry.** Functions and graphs, exponential and logarithmic functions, trigonometry, conic sections. (Fall 2005, Fall 2010).

Teaching Assistant

- **Thermodynamics in Energy and Mineral Engineering.** First and second laws of thermodynamics, electrochemistry, thermodynamics of mixtures (Fall 2014, Spring 2015, Fall 2015, Spring 2016).
- **Symplectic Geometry.** Differential forms, symplectic and contact geometry. Part of the MASS Program. (Fall 2008).

ADVISING

Undergraduate Advising

[1] Carl Frederick Aquino, Summer 2019-Spring 2020. Undergraduate thesis on probabilistic inversion of expert assessments for ice sheet modeling.

AWARDS

National Science Foundation

- Graduate Research Fellowship Honorable Mention, 2015

Pennsylvania State University

- Graduate School, Harold F. Martin Graduate Assistant Oustanding Teaching Award, 2011
- Department of Mathematics, Charles H. Hoover Memorial Award, 2010
- Department of Mathematics, Departmental Teaching Award, 2008
- Department of Mathematics, ZZRQ Award, 2006

OUTREACH

- Taught session on multi-objective robust decision-making at SCRiM Summer School, 2018–19.

SERVICE

- Co-Chair, MultiSector Dynamics Working Group on Uncertainty Quantification and Scenario Development, 2019–present.
- Member, MultiSector Dynamics Community of Practice Scientific Steering Group
- Co-Convener and Co-Chair, AGU 2020 Session on MultiSector Dynamics: Science and Modeling for Societal Transformations II
- Co-Guest Editor, *Water* Special Issue on "Climate Model Projections: Sea-Level Rise and Impacts on Coastal Defense Decision-Making," forthcoming.
- Reviewed articles for *Sol. Energy*, *J. Appl. Meteorol. Climatol.*, *Earths Future*, *Risk Analysis*, *Environ. Res. Lett.*, *Interdiscipl. Sci. Rev.*, *Earth Space Sci.*, *Environ. Model. Softw.*, *Adv. Stat. Clim. Meteorol. Oceanogr.*, *Water Resour. Res.*

PROFESSIONAL EXPERIENCE

Pennsylvania State University, State College, PA

Research Assistant, Brownson Solar Research Group — August 2011 to January 2014

Journal of Modern Dynamics

Technical Editor — 2008 to 2010