Troy Butler

CONTACT INFORMATION

University of Colorado Denver
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EDUCATION

Colorado State University, Fort Collins, Colorado USA

Ph.D., Mathematics, August 2009

- Dissertation Topic: "Computational Measure Theoretic Approach to Inverse Sensitivity Analysis: Methods and Analysis"
- Advisor: Don Estep

M.S., Mathematics, May 2005

- Thesis Topic: "Numerical Continuation Using Broyden's Method"
- Advisor: Eugene Allgower

B.S., Electrical Engineering, Magna Cum Laude, May, 2003

PROFESSIONAL EXPERIENCE

Associate Dean of Research and Creative Activities **Su. 2025 - present**
College of Liberal Arts and Sciences, University of Colorado Denver

Program Director **Fa. 2023 - Su. 2025**
Division of Mathematical Sciences (DMS), National Science Foundation
Programs managed: Computational Mathematics, Research Experience for Undergraduates (REUs), Infrastructure, Algorithms for Modern Power Systems (AMPS, partnership between DMS and Department of Energy), Mathematical Foundations of Digital Twins (MATH-DT, partnership between DMS and Air Force Office of Scientifice Research), Mathematical Foundations of Artificial Intelligence (MFAI)
Services & Leadership: DMS Data Tools team (co-lead), DMS Virtual Office Hours team (served as team lead in second year), DMS liaison team to the EDU directorate

Professor **Fa. 2023 - present**
Department of Mathematics and Statistical Sciences, University of Colorado Denver

Associate Chair **Fa. 2021 - Su. 2023**
Department of Mathematics and Statistical Sciences, University of Colorado Denver

Associate Professor **Fa. 2019 - Su. 2023**
Department of Mathematics and Statistical Sciences, University of Colorado Denver

Director, Center for Computational Mathematics (CCM) **Fa. 2014 - Su. 2017**
Director for CCM is a 3-year appointment

Assistant Professor **Fa. 2013 - Su. 2019**
Department of Mathematics and Statistical Sciences, University of Colorado Denver

Research Scientist, Level II **Fa. 2012 - Su. 2013**
Department of Statistics, Colorado State University

Instructor for STAT 315: Statistics for Engineers and Scientists **Fa. 2012 - Sp. 2013**
Department of Statistics, Colorado State University

Research Associate **Fa. 2011 - Su. 2012**
Institute for Computational Engineering and Sciences (ICES)
Computational Hydraulics Group, The University of Texas at Austin

Instructor for ASE 311: Engineering Computation **Fa. 2011**
Aerospace Engineering department, The University of Texas at Austin

ICES Postdoctoral Fellow **Fa. 2009 - Fa. 2011**
Institute for Computational Engineering and Sciences (ICES)
Computational Hydraulics Group, The University of Texas at Austin

Graduate Research Assistantship **Su. 2006, Fa. 2007, Su. 2008 - Su. 2009**
Colorado State University

Source of support: Department of Energy (DE-FG02-05ER25699) and the National Science Foundation (DGE-0221595003, MSPA-CSE-0434354)

Graduate Teaching Assistantship **Fa. 2003 - Su. 2005, Sp. 2008**
Colorado State University

Grader for STAT 521: Stochastic Processes I **Sp. 2008**
Department of Statistics, Colorado State University

External Grants, Contracts, and Misc. Funding

Funding Agency: Computational Mathematics, Division of Mathematical Sciences, National Science Foundation, **Amount requested:** \$630,209 (CU Denver portion: \$430,209), **Title:** *Collaborative Research: Advancing the Data-to-Distribution Pipeline for Scalable Data-Consistent Inversion to Quantify Uncertainties in Coastal Hazards (NSF DMS-2208460)*, **Personnel:** T. Butler (lead PI); C. Dawson (Co-PI). **Funded in the amount:** \$550,000 (CU Denver portion: \$375,400) **2022-25**

Funding Agency: Colorado Department of Higher Education, **Title:** *OER for the Creation of Interactive Computational Notebooks and a Computational Pathway in Mathematics and Statistics*, **Personnel:** T. Butler (lead PI). **funded in the amount:** \$156.4k with \$109.1k from CDHE with the remaining coming from CU Denver matching funds) **2022-24**

Funding Agency: Computational Mathematics, Division of Mathematical Sciences, National Science Foundation, **Amount requested:** \$557,328 (CU Denver portion: \$240,096) **Funded in the amount:** \$355,000 (CU Denver portion: \$175,000), **Title:** *Collaborative Research: Construction and Analysis of Numerical Methods for Stochastic Inverse Problems with Application to Coastal Hydrodynamics (NSF DMS-1818941)*, **Personnel:** T. Butler (lead PI); C. Dawson and D. Estep (Co-PIs). **2018-22**

Funding Agency: High Performance Computing Modernization Program, Department of Defense, **Amount requested:** \$102.3k (funded in full), **Title:** *Development of Uncertainty Quantification and Design Approaches and Solutions for CREATE/SENTRi*, **Personnel:** T. Butler (PI), **Funding Type:** Subcontracted through a Direct Contract to Colorado State University. **2018-2022**
• Due to changes in the dissemination of external funding by grant contractors used by the DOD, we discontinued subcontracting through CU Denver in Aug. 2019. The remaining \$80+k of funds were disseminated over 2019-2022 performance period as independent contracting/consulting.

Funding Agency: Department of Energy, Office of Science, Advanced Scientific Computing Research, Mathematical Multifaceted Integrated Capability Centers (MMICCs) program, **Amount requested:** \$204,655 (funded in full through subcontract of the funded award total of \$12,500,000), **Title:** *DiaMonD: An Integrated Multifaceted Approach to Mathematics at the Interfaces of Data, Models, and Decisions (DE-SC0009279)*, **Personnel:** O. Ghattas and K. Wilcox (lead PIs); D. Estep, C. Gable, M. Gunzburger, B. Sumpter, L .Ying (institutional PIs); G. Biros, C. Dawson, R. Juanes, Y. Marzouk, R. Moser, J.T. Oden (Co-PIs); **T. Butler** (investigator on original grant and PI on subcontract through Colorado State University for 2014-18). **Funding Type:** Subcontract through Colorado State University **2012-18**

Funding Agency: High Performance Computing Modernization Program, Department of Defense, **Amount requested:** \$66,321 (funded in full), **Title:** *Uncertainty Quantification for HPCMP CREATE*, **Personnel:** T. Butler (PI), **Funding Type:** Direct Contract. **2014-16**

Funding Agency: Nuclear Energy University Programs, Department of Energy, **Amount requested:** \$70,596 (funded in full), **Title:** *Multiscale modeling and uncertainty quantification for nuclear fuel performance*, **Personnel:** T. Butler (PI), **Funding Type:** Subcontract through Colorado State University. **2013-15**

Funding Agency: Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences, Division of Mathematical Sciences, National Science Foundation, **Amount requested:** \$550,000 total (funded in full while Research Associate at ICES, \$57,020 to CU Denver through subcontract from Colorado State University), **Title:** *Data-Driven Inverse Sensitivity Analysis for Predictive Coastal Ocean Modeling (NSF DMS-1228206)*, **Personnel:** C. Dawson (lead PI);

T. Butler, D. Estep and J. Westerink (Co-PIs). **2012-15**

Misc. Funding: J. Tinsley Oden Faculty Research Fellowship
Research fellowship awarded by ICES funding travel to The University of Texas at Austin to collaborate with ICES faculty, researchers, and students on advanced research in computational engineering, mathematics, and sciences. Awarded separately $5,000 in Su. 2013, $3,000 in Fa. 2013, $6,000 in Sp. 2020, and $4,000 in Fa. 2022

CONTRACTS AND MISC. FUNDING (INTERNAL)

Misc. Funding: CFD Teaching Enhancement Grant
• Proposal for $3k (funded in full) to develop and disseminate interactive short course material on using Python for Scientific Computations, Foundations of Machine Learning and Data Science, and Collaboration with Git.
• Proposal for $3k (funded in full) to fund a graduate student to develop interactive JupyterHub content for undergraduate mathematics courses.

Misc. Funding: CLAS Dissemination Grant
The CLAS Dissemination Grant is a competitive program that provides an opportunity for tenure-track, tenured, and clinical teaching track faculty to disseminate research and creative work via publication (page and other publication charges), travel to support presentations at professional meetings, website design related to communication of research results, or other scholarly dissemination venues.
• Awarded $1,000 in Fall 2015 to attend workshop on uncertainty quantification at the Mittag-Leffler Institute in Spring 2016.
• Awarded $2,000 in Spring 2018 to attend SIAM Annual 2018 Conference.

Misc. Funding: University Student and Technology Fee Committee (SITFAC) Grant,
• Fall 2015: Proposal for $20k (funded in full) to upgrade computer resources for graduate students in the Department of Mathematical and Statistical Sciences (proposal prepared by myself, Jan Mandel, and Joseph Malingowski)
• Spring 2018: Proposal for approximately $15k (funded in full) to obtain computational server utilized as JupyterHub for development/dissemination of computational content throughout mathematics curriculum.

Misc. Funding: Young Upwardly Mobile Professors Grant, **Sp. 2015 and Sp. 2018**
Small internal grants intended to support research activities to untenured tenure-track faculty at UC-Denver.
• Awarded $500 in Fall 2014 to attend the SIAM CS& E 2015 Conference.
• Awarded $500 in Spring 2018 to attend the SIAM UQ 2018 Conference.
• Awarded $500 in Spring 2019 to attend the SIAM CSE 2019 Conference.

TEXTBOOKS

- *A Ramble Through Probability: How I Learned to Stop Worrying and Love Measure Theory*, Samopriya Basu, Troy Butler, Don Estep, and Nishant Panda, ISBN:978-1-61197-781-3, Publisher: SIAM, Published: 2024
  - This book is intended for graduate students in engineering, mathematics, science, and statistics. Researchers who need to use probability theory will also find it useful.

RESEARCH SOFTWARE DEVELOPED

- **BET** **v3.0, Su. 2020**
  - A python based package for quantifying uncertainties using rigorous measure-theoretic approaches/formulations of stochastic inverse and forward problems.
  - Role: Co-developer/admin.
- **LUQ** **v2.0.0, Sp. 2024**

– A python based package for learning uncertain quantities of interest (QoI) from noisy spatio-temporal data obtained on dynamical systems that utilizes multiple machine learning algorithms in the data-to-QoI pipeline.

– Role: Co-developer/admin.

Peer Reviewed Journal Articles

[43] *Building Population-Informed Priors for Bayesian Inference Using Data-Consistent Stochastic Inversion*, R.D. White, J.D. Jakeman, T. Wildey, T. Butler, status: accepted, to appear in SIAM/ASA Journal on Uncertainty Quantification

[42] *Local Stochastic Sensitivity Analysis For Dynamical Systems*, N. Panda, J.H. Chaudhry, N. Klein, J. Carzon, T. Butler, Proceedings of The 28th International Conference on Artificial Intelligence and Statistics, PMLR 258:4195-4203, 2025

[41] *Stability and Convergence of Solutions to Stochastic Inverse Problems Using Approximate Probability Densities*, T. Butler, R. Spence, T. Wildey, T.Y. Yen, International Journal for Uncertainty Quantification, Vol. 15 (4), pp. 21-51, 2025

[40] *Sequential Maximal Updated Density Parameter Estimation for Dynamical Systems with Parameter Drift*, C. del-Castillo-Negrete, R. Spence, T. Butler, C. Dawson, International Journal for Numerical Methods in Engineering, Vol. 126 (3), pp. e7618, 2025

[39] *A Machine-Learning Enabled Framework for Quantifying Uncertainties in Parameters of Computational Models*, T. Roper, H. Hakula, T. Butler, Computers & Mathematics with Applications, Vol. 182, pp. 184-212, 2025

[38] *A Distributions-Based Approach to Data-Consistent Inversion*, K.O. Bergstrom, T. Butler, T. Wildey, SIAM Journal on Scientific Computing, Vol. 46 (5), pp. A3124-A1350, 2024

[37] *A novel application of data-consistent inversion to overcome spurious inference in genome-wide association studies*, N. Janani, K.A. Young, G. Kinney, M. Strand, J.E. Hokanson, Y. Liu, T. Butler, E. Austin, Genetic Epidemiology, Vol. 48 (6), pp. 270-288, 2024

[36] *Inverse Problems for Physics-Based Process Models*, D. Bingham, T. Butler, D. Estep, Annual Review of Statistics and Its Application, Vol. 11, pp. 461-82, 2024

[35] *Parameter estimation with maximal updated densities*, M. Pilosov, C. del-Castillo-Negrete, T. Yu Yen, T. Butler, C. Dawson, Computer Methods in Applied Mechanics and Engineering, Vol. 407, pp. 115906, 2023

[34] *L^p Convergence of Approximate Maps and Probability Densities for Forward and Inverse Problems in Uncertainty Quantification*, T. Butler, T. Wildey, W. Zhang, International Journal for Uncertainty Quantification, DOI: 10.1615/Int.J.UncertaintyQuantification.2022038086, Vol. 12 (4), pp. 65–92, 2022

[33] *Learning Quantities of Interest from Dynamical Systems for Observation-Consistent Inversion*, S. Mattis, K.R. Steffen, T. Butler, C. Dawson, D. Estep, Computer Methods in Applied Mechanics and Engineering, Vol. 388, pp. 114230, 2022

[32] *Adjoint Sensitivity Analysis for Uncertain Material Parameters in Frequency Domain 3-D FEM*, J. Harmon, C. Key, D. Estep, T. Butler, B. Notaros, IEEE Transactions on Antennas and Propagation, DOI: 10.1109/TAP.2021.3070059, Vol. 69 (10), pp. 6669–6679, 2021

[31] *Adjoint-based Accelerated Adaptive Refinement in Frequency Domain 3-D Finite Element Method Scattering Problems*, J. Harmon, C. Key, D. Estep, T. Butler, B. Notaros, IEEE Transactions on Antennas and Propagation, Vol. 69 (2), pp. 940–949, 2021

[30] *What do we hear from a drum? A data-consistent approach to quantifying irreducible uncertainty on model inputs by extracting information from correlated model output data*, T. Butler and H. Hakula, Computer Methods in Applied Mechanics and Engineering, Vol. 370, pp. 113228, 2020

[29] *Optimal experimental design for prediction based on push-forward probability measures*, T. Butler, J.D. Jakeman, and T. Wildey, Journal of Computational Physics, Vol. 416, pp. 109518, 2020

[28] *Data-consistent inversion for stochastic input-to-output maps*, T. Butler, T. Wildey, and T. Yu Yen, Inverse Problems, Vol. 36 (8), pp. 085015, 2020

[27] *A Posteriori Error Estimation and Adaptive Discretization Refinement Using Adjoint Methods in CEM: A Study with a One-Dimensional Higher-Order FEM Scattering Example*, C. Key, A. Smull, D. Estep, T. Butler, and B. Notaros, IEEE Transactions on Antennas and Propagation, Vol. 68 (5), pp. 3791-3806, 2020

[26] *Uncertainty Modeling of Carbon-Fiber-Reinforced Polymer-Confined Concrete in Acid-Induced Damage*, Y.J. Kim, Y. Ji, and T. Butler, ACI Structural Journal, Vol. 116 (6), pp. 97-108, 2019

[25] *Data-driven uncertainty quantification for predictive flow and transport modeling using support vector machines*, J. He, S.A. Mattis, T.D. Butler, and C.N. Dawson, Computational Geosciences, Vol. 23 (4), pp. 631-645, 2019

[24] *Enhancing piecewise-defined surrogate response surfaces with adjoints on sets of unstructured samples to solve stochastic inverse problems*, S.A. Mattis and T. Butler, International Journal for Numerical Methods in Engineering, Vol. 119 (10), pp. 923-940, 2019

[23] *Convergence of Probability Densities using Approximate Models for Forward and Inverse Problems in Uncertainty Quantification*, T. Butler, J. Jakeman, T. Wildey, SIAM Journal on Scientific Computing, Vol. 40, No. 5, pp. A3523-A3548, 2018.

[22] *A Posteriori Element-wise Error Quantification for FEM Solvers Using Higher Order Basis Functions*, C. Key, A. Smull, B.M. Notaros, D. Estep, T. Butler, 2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Boston, MA, USA, 2018, pp. 1319-1320, doi: 10.1109/APUSNCURSINRSM.2018.8608495

[21] *Combining Push-forward Measures and Bayes' Rule to Construct Consistent Solutions to Stochastic Inverse Problems*, T. Butler, J. Jakeman, and T. Wildey, SIAM Journal on Scientific Computing, Vol. 40, No. 2, pp. A984-A1011, 2018.

[20] *Utilizing Adjoint-Based Error Estimates for Surrogate Models to Accurately Predict Probabilities of Events*, T. Butler and T. Wildey, International Journal for Uncertainty Quantification, Vol. 8, No. 2, pp.143-159, 2018.

[19] *Designing experiments to reduce uncertainty in point source locations in the Helmholtz equation*, T. Butler, 2018 International Applied Computational Electromagnetics Society Symposium (ACES), pp. 1-2, doi: 10.23919/ROPACES.2018.8364316.

[18] *A Measure-Theoretic Interpretation of Sample Based Numerical Integration with Applications to Inverse and Prediction Problems Under Uncertainty*, T. Butler, L. Graham, S. Mattis, and S. Walsh, SIAM Journal on Scientific Computing, Vol. 39, No. 5, (2017), pp. A2072-A2098

[17] *A Stochastic Inverse Problem for Multiscale Models*, N. Panda, T. Butler, D. Estep, L. Graham, and C. Dawson, International Journal for Multiscale Computational Engineering, Vol. 15, No. 3, (2017), pp. 265–283

[16] *A Measure-Theoretic Algorithm for Estimating Bottom Friction in a Coastal Inlet: Case Study of Bay St. Louis during Hurricane Gustav (2008)* , L. Graham, T. Butler, S. Walsh, C. Dawson, and J.J. Westerink, Monthly Weather Review , Vol. 145(3), pp. 929–954, 2017.

[15] *Parameter estimation and prediction for groundwater contamination based on measure theory*, S.A. Mattis, T.D. Butler, C.N. Dawson, D. Estep, V.V. Vesselinov, Water Resources Research, Vol. 51, (2015), pp. 7608–7629

[14] *Definition and solution of a stochastic inverse problem for the Manning's n parameter field in hydrodynamic models*, T. Butler, L. Graham, D. Estep, C. Dawson, J.J. Westerink, Advances in Water Resources, Vol. 78, (2015), pp. 60–79

[13] *Quantifying Uncertainty in Material Damage from Vibrational Parameters*, T. Butler, A. Huhtala, M. Juntunen, Journal of Computational Physics, Vol. 283, (2015), pp. 414–435

[12] *A comparison of ensemble Kalman filters for short range storm surge forecasting*, M.U. Altaf, T. Butler, T. Mayo, X. Luo, C. Dawson, A.W. Heemink, I. Hoteit, Monthly Weather Review, Vol. 142, No. 8, (2014), pp. 2899–2914

[11] *A measure-theoretic computational method for inverse sensitivity problems III: Multiple Quantities of Interest*, T. Butler, D. Estep, S. Tavener, C. Dawson, J.J. Westerink, SIAM/ASA Journal on Uncertainty Quantification, Vol. 2, (2014), pp. 174–202

[10] *Data Assimilation within the Advanced Circulation (ADCIRC) Modeling Framework for the Estimation of Manning's Friction Coefficient*, T. Mayo, T. Butler, C. Dawson, I. Hoteit, Ocean Modelling, Vol. 76, (2014), pp. 43–58

[9] *Propagation of uncertainties using improved surrogate models*, T. Butler, C. Dawson, and T. Wildey, SIAM/ASA Journal on Uncertainty Quantification, Vol. 1, No. 1, (2013), pp. 164–191

[8] *Improving Short-Range Ensemble Kalman Storm Surge Forecasting Using Robust Adaptive Inflation*, M.U. Altaf, T. Butler, X. Luo, C. Dawson, T. Mayo, and I. Hoteit, Monthly Weather Review, Vol. 141, No. 8, (2013), pp. 2705–2720

[7] *A numerical method for solving a stochastic inverse problem for parameters*, T. Butler and D. Estep, Annals of Nuclear Energy, Vol. 52, (2013), pp. 86–94

[6] *Data Assimilation within the Advanced Circulation (ADCIRC) Modeling Frameowork for Hurricane Storm Surge Forecasting*, T. Butler, M.U. Altaf, C. Dawson, I. Hoteit, X. Luo, and T. Mayo, Monthly Weather Review, Vol. 140, No. 7. (2012), pp. 2215–2231

[5] *Reparameterization for statistical state estimation applied to differential equations*, T. Butler and M. Juntunen, Journal of Computational Physics, Vol. 231, (2012), pp. 2641–2654

[4] *A posteriori error analysis of parameterized linear systems using spectral methods*, T. Butler, P. Constantine, and T. Wildey, SIAM Journal on Matrix Analysis and Applications, Vol. 33, (2012), pp. 195–209

[3] *A computational measure-theoretic approach to inverse sensitivity problems II: A posteriori error analysis*, T. Butler, D. Estep, and J. Sandelin, SIAM Journal on Numerical Analysis, Vol. 50, (2012), pp. 22–45

[2] *A measure-theoretic computational method for inverse sensitivity problems I: Method and Analysis*, J. Breidt, T. Butler, and D. Estep, SIAM Journal on Numerical Analysis, Vol. 49, (2011), pp. 1836–1859

[1] *A posteriori error analysis of stochastic differential equations using polynomial chaos expansions*, T. Butler, C. Dawson, and T. Wildey, SIAM Journal on Scientific Computing, Vol. 33, (2011), pp. 1267–1291

Seminar & Workshop Presentations

[77] *Uncertainty Quantification (we are certainly uncertain)*, The Denver Round Table philanthropic luncheon, April 10, 2025

[76] *Optimal Data Acquisition with Data-Consistent Inversion and Learning of Uncertain Quantities*, Inverse Problems and Data Assimilation for Digital Twins Minisymposium, DTE & AICOMAS 2025, Paris, France, February 18, 2025

[75] *From Displacements to Distributions and Population-Informed Priors*, SIAM UQ special session at the Joint Mathematics Meeting, Seattle, WA, January 8-11, 2025

[74] *Uncertainty quantification models in research*, Plenary Presentation at the ACVAA Annual Meeting 2024, September 25-27, 2024

[73] *Transforming Displacements to Distributions with a Machine-Learning Framework*, UCCS Data Science Seminar, University of Colorado Colorado Springs, September 20, 2024

[72] *Cooking Steaks, Storm Surge, and Other Uncertainty Quantification Problems: An Interactive Talk Using Jupyter Notebooks*, Earth Science Seminar, Jet Propulsion Laboratory, Pasadena, CA, May 23, 2023

[71] *Data-Consistent Inversion: A Collaborative Presentation*, Applied Math Seminar, Colorado State University, April 6, 2023

[70] *Striking the Right Chord (Part II): Learning to Hear*, Minisymposium on Stories of Marrying Methods and Applications, SIAM Conference on Computational Science and Engineering, Amsterdam, The Netherlands, February 26–March 3, 2023

[69] *The Role of the Push-Forward Measure in Solving Inverse Problems for Uncertainty Quantification: An Interactive Talk Using Jupyter Notebooks*, Aalto-Helsinki Applied Mathematics Seminar, University of Helsinki, Finland, February 23, 2023

[68] *Learning Uncertain Quantities for Data-Consistent Inversion: A Data-to-Distribution Pipeline*, Minisymposium on Data-Driven and Data-Consistent Approaches for Solving Inverse Problems, SIAM Conference on Mathematics of Data Science, hybrid (attended in-person), September 26–30, 2022

[67] *Learning Uncertain Quantities of Interest from Dynamical Systems for Data-Consistent Inversion*, Minisymposium on Uncertainty Quantification for Data-Intensive Inverse Problems and Machine Learning, SIAM Conference on Uncertainty Quantification, hybrid (attended remotely), April 12–15, 2022

[66] *Learning Quantities of Interest from Dynamical Systems for Observation-Consistent Inversion*, Minisymposium on Recent Advances in Computational Probability, SIAM Conference on Computational Science and Engineering, online, March 1–5, 2021

[65] *Data Consistent Inversion: An Interactive Talk Using Jupyter Notebooks*, Oden Institute Seminar, University of Texas at Austin, January 23, 2020

[64] *An Interactive Guide to Data-Consistent Solutions for Stochastic Inverse Problems, Part I: The Role of Set-Valued Inverses*, AMS Special Session on Set-Valued and Fuzzy-Valued Analysis with Applications, Joint Mathematics Meeting, Denver, CO, January 15-18, 2020

[63] *Extensions and Applications of a Data-Consistent Approach to Quantifying Uncertainties in Physical Parameters of Flow Models*, Minisymposium on Computational Methods for Environmental Fluid Mechanics, US National Congress on Computational Mechanics, Austin, TX, July 28–August 1, 2019

[62] *Data Consistent Inversion: An Interactive Talk Using Jupyter Notebooks*, Numerical Analysis Seminar, North Carolina State University, March 26, 2019

[61] *Consistent Parameter Distributions in High-dimensional Spaces: Built One Dimension at a Time*, Minisymposium on Exploiting Model Hierarchies, Sparsity and Low-rank Structure of Large-scale Bayesian Computation, SIAM Conference on Computational Science and Engineering, Spokane, WA, February 25–March 1, 2019

[60] *The Role of the Push-Forward Measure in Solving Inverse Problems: An Interactive Talk Using Jupyter Notebooks*, Applied Math Seminar, Colorado State University, October 4, 2018

[59] *The Role of the Push-Forward Measure in Solving Inverse Problems with Solutions to Forward Problems in Uncertainty Quantification: An Interactive Talk Using Jupyter Notebooks*, University of Colorado Denver, CCM Seminar, September 10, 2018

[58] *The Role of the Push-Forward Measure in Solving Inverse Problems with Solutions to Forward Problems in Uncertainty Quantification: An Interactive Talk Using Jupyter Notebooks*, Invited Statistical Sciences Seminar Series (CCS-6), Los Alamos National Laboratory, August 6, 2018

[57] *Consistent Bayesian Inference with Push-Forward Measures: Surrogate Modeling and Convergence of Solutions*, Keynote Presentation, Minisymposium on Advances in Uncertainty Quantification for Multi-physics Applications, 13th World Congress on Computational Mechanics, New York City, NY, July 22–27, 2018

[56] *Consistent Bayesian Inference with Push-Forward Measures: Theoretical Developments*, Minisymposium on New Methodologies for Uncertainty Quantification and Applications to the Geosciences, SIAM Annual Meeting, Portland, OR, July 9–13, 2018

[55] *An Introduction to Consistent Bayesian Inversion*, (a 55-minute presentation co-presented with Dr. Tim Wildey) Tutorials for Students: Accessible Introductions to Active Research Areas, SIAM Annual Meeting, Portland, OR, July 9–13, 2018

[54] *Convergence of Consistent Bayesian Inversion using Surrogates*, Minisymposium on Recent Advances in Surrogate-based Uncertainty Quantification Methods for Extreme-scale Scientific Computing at the SIAM Conference on Uncertainty Quantification, April 16–19, 2018

[53] *Designing Experiments to Reduce Uncertainty in Point Source Locations in the Helmholtz Equation*, Minisymposium on Uncertainty Quantification and Modeling for Complex Applications at the 2018 International Applied Computational Electromagnetics Society Symposium, March 25–29, 2018

[52] *Consistent Inversion of Uncertain Data for Models of Storm Surge, Subsurface Contaminant Transport, and Cooking Steaks*, University of Denver, Analysis Seminar, February 16, 2018

[51] *Storm Surge, Contaminant Transport, Cooking Steaks, and Other Reasons to Study Computational Mathematics*, Metro State University, Mathematics Department Colloquium, January 19, 2018

[50] *Sequential vs Joint Inversion of Probability Distributions*, Minisymposium on Numerical Simulation under Uncertainty at the SIAM Central States Meeting, Colorado State University, Fall 2017

[49] *Optimal Experimental Design Using Sampled Singular Values*, Minisymposium on Perspectives on Uncertainty Quantification at the SIAM Central States Meeting, Colorado State University, Fall 2017

[48] *New Perspectives on Bayesian Inversion and Optimal Experimental Design*, Sandia National Laboratory, Center for Computing Research Seminar, July 24, 2017

[47] *From Inverses to Predictions: End-to-End UQ with MC Methods*, Minisymposium on Monte Carlo and Ensemble Methods for Uncertainty Quantification at the SIAM Conference on Computational Science and Engineering, Atlanta, GA, February 27–March 3, 2017

[46] *Storm Surge, Contaminant Transport, Cooking Steaks, and Other Reasons to Study Computational Mathematics*, University of Colorado Denver, CCM Seminar, August 29, 2016

[45] *A new approach to stochastic inverse problems for scientific inference: Hands-on software package tutorial*, A three-part tutorial on the Python package BET, Rocky Mountain Mathematics Consortium Summer School 2016, University of Wyoming, June 12–17, 2016

[44] *Adaptive Sample Based Integration Techniques in Inverse and Prediction UQ Problems*, Minisymposium on Adaptive Methods for Forward and Inverse Propagation of Uncertainty in Computational Models at the European Congress on Computational Methods in Applied Sciences and Engineering, Crete, Greece, June 5–10, 2016

[43] *From quantification to reduction of uncertainties: A measure-theoretic perspective*, Workshop on Uncertainty Quantification, Mittag-Leffler Institute, Stockholm, Sweden, May 9–13, 2016

[42] *How does a mathematician cook the perfect steak? ... and other interesting applications of optimal experimental design*, Colorado State University, Department of Mathematics, Applied Math Seminar, April 21, 2016

[41] *End-to-end quantification of uncertainty using measure theory*, University of Colorado Colorado Springs, Department of Mathematics, Colloquium Series, October 22, 2015

[40] *Non-Intrusive Algorithms for Measure-Theoretic Propagation of Uncertainties- Errors, Opportunities, and Challenges*, Workshop on Numerical Methods for Large-Scale Nonlinear Problems and Their Applications, ICERM, Brown University, August 31–September 4, 2015

[39] *Advances in High-Dimensional Computational Measure Theory for Inverse Problems*, Minisymposium on Scalable Methods for Uncertainty Quantification at the 2015 US National Congress on Computational Mechanics Conference, San Diego, CA, July 26–30, 2015

[38] *Algorithms and error analysis of a measure theoretic framework for quantifying uncertainty*, Rocky Mountain Summer Workshop on Uncertainty Quantification, Denver, CO, July 15–17, 2015

[37] *BET Tutorial and Demos*, co-presenter, Rocky Mountain Summer Workshop on Uncertainty Quantification, Denver, CO, July 15–17, 2015

[36] *Quantifying Errors in a Probabilistic Solution to Stochastic Inverse Problems for Physics-Based Models*, Minisymposium on Error Analysis and Scalability of UQ Methodologies for Inverse Problems at the SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, March 14–18, 2015

[35] *BET: Algorithmic and Error Analyses*, Minisymposterium – BET: Open Source Software for Stochastic Inverse Problems in a Measure-Theoretic Context, SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, March 14–18, 2015

[34] *Quantifying Uncertainty in Physics-Based Models with Measure Theory*, Minisymposium on Uncertainty and Sensitivity in Models and Observations and Their Impacts on Decision Making Related to Geological, Hydrological, and Environmental Applications I at the 2014 AGU Fall Meeting, San Francisco, CA, December 15–19, 2014

[33] *A Practical Guide to Measure-Theoretic Inversion: Algorithms and Error Estimation*, Minisymposium on Inverse Problems for Coastal Engineering and Subsurface Flow at the SIAM Annual 2014 Conference, Chicago, IL, July 7–11, 2014

[32] *Solving Stochastic Inverse Problems Using Sigma-Algebras on Contour Maps*, Plenary Talk, Conference on Data Analysis (CoDA) 2014, Santa Fe, NM, March 5–7, 2014

[31] *Solving Stochastic Inverse Problems Using Sigma-Algebras on Contour Maps*, Poster Presentation, Conference on Data Analysis (CoDA) 2014, Santa Fe, NM, March 5–7, 2014

[30] *Uncertainty Quantification with Generalized Polynomial Chaos and Adjoints*, University of Colorado Denver Department of Mathematical and Statistical Sciences, CCM Seminar, October 22, 2013

[29] *A posteriori error analysis for an approximate distribution*, University of Colorado Denver Department of Mathematical and Statistical Sciences, Data Assimilation Seminar, October 21, 2013

[28] *What are stochastic inverse problems for deterministic models?*, Large-Scale Inverse Problems and Quantification of Uncertainty Workshop, Santa Fe, NM, May 22–24, 2013

[27] *Approximation and Use of Set-Valued Solutions to Stochastic Inverse Problems*, Minisymposium on Numerical Methods for Stochastic Inverse Problems at the SIAM Conference on Computational Science and Engineering, Boston, MA, February 25–March 1, 2013

[26] *Utilizing Adjoints to Improve Propagation of Uncertainties through Surrogate Response Surfaces*, Minisymposium on Adjoint Methods for Computational PDEs at the SIAM Conference on Computational Science and Engineering, Boston, MA, February 25–March 1, 2013

[25] *Stochastic Inverse Problems for Parameters of Physics-Based Models with Multiple Quantities of Interest*, Colorado School of Mines, AMS Colloquium, February 14, 2013

[24] *Stochastic Inverse Problems for Parameters of Physics-Based Models*, The University of Colorado Denver, Department of Mathematical & Statistical Sciences Colloquium, February 12, 2013

[23] *Applying a Non-intrusive Measure Theoretic Inverse Analysis to Storm Surge*, Colorado State University, Department of Statistics Seminar, September 17, 2012

[22] *A Non-intrusive Alternative to a Computational Measure Theoretic Inverse*, SAMSI UQ Transtion Workshop, Research Triangle Park, NC, May 21–23, 2012

[21] *A Non-intrusive Alternative to a Computational Measure Theoretic Inverse*, Minisymposium on Inference for Models Using Set-valued Inverses at the SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 2–5, 2012

[20] *Estimating and Bounding Errors in Distributions Propagated via Surrogate Models*, Minisymposium on A Posteriori Error Estimation for Reliable Uncertainty Quantification (co-organizer) at the SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 2–5, 2012

[19] *Data Assimilation within the ADvanced CIRCulation (ADCIRC) Modeling Framework for Hurricane Storm Surge Forecasting*, Ocean Sciences Meeting, February 20–24, 2012, Salt Lake City, UT

[18] *Propagation of Numercal Errors and Probability Distributions Through Polynomial Approximated Response Surfaces*, Department of Mathematical Sciences Seminar, George Mason University, February 1, 2012

[17] *Propagation of Numercal Errors and Probability Distributions Through Polynomial Approximated Response Surfaces*, Department of Applied Mathematics Seminar, Naval Postgraduate School, January 26, 2012

[16] *Recent Advances and Applications of A Posteriori Error Estimates for Polynomial Chaos Expansions for Differential Equations*, Minisymposium on Advances in the Predictive Simulation of Complex Systems at the International Conference of Industrial and Applied Mathematics, Vancouver, Canada, July 2011

[15] *A Posteriori Error Estimates for Polynomial Chaos Expansions of Response Surfaces for Differential Equations*, Minisymposium on Numerical Methods for Stochastic Computation and Uncertainty Quantification at the SIAM Conference on Computational Science and Engineering, Reno, Nevada, February 2011

[14] *Statistical State Estimation Applied to Differential Equations: A Non-Dynamically Constrained Approach*, Minisymposium on Data Assimilation and Inverse Problems in Geosciences at the 8th International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece, September 2010

[13] *A Measure Theoretic Computational Approach for Inverse Sensitivity Problems*, Workshop on Verification and Validation for Nuclear Systems Analysis, Myrle Beach, South Carolina, May 2010

[12] *Computational Measure Theoretic Approach to Inverse Sensitivity Analysis: Methods and Analysis*, ICES Seminar, Institute for Computational Engineering and Sciences, The University of Texas at Austin, September 2009

[11] *Computational Measure Theoretic Method for Posterior Density Estimation*, Graybill VIII and 6th International Conference on Extreme Value Analysis, Colorado State University, June 2009

[10] *A Sample-Free Method to Approximating a Probability Measure for Inverse Problems*, Sandia National Laboratory, February 2009

[9] *Inverse Sensitivity Analysis*, Lawrence Livermore National Laboratory, February 2009

[8] *A Computational Measure Theoretic Approach to Inverse Sensitivity Problems: Basic Method and Analysis*, Inverse Problems Seminar, Department of Mathematics, Colorado State University, September 2008

[7] *Alternative Sampling Method of Posterior Distributions*, NREL Model-Data Fusion Seminar, Natural Resource Ecology Laboratory, Colorado State University, March 2008

[6] *A Computational Measure Theoretic Approach to Inverse Sensitivity Analysis*, SIAM Annual Meeting, Pittsburgh, Pennsylvania, July 2010

[5] *Probabilistic Inverses and Model Verification*, 7th Hawaii International Conference on Statistics, Mathematics and Related Fields, Honolulu, Hawaii, January 2008

[4] *Statistical Inversion*, Departmental Greenslope Seminar, Colorado State University, November 2007

[3] *Survey of Short Course on Sensitivity Analysis*, Departmental Greenslope Seminar, Colorado State University, October 2007

[2] *Does exclusion of random error alter model inference? A case study using grizzly bears (Ursus arctos) of the Greater Yellowstone Ecosystem*, PRIMES Summer Research Project Presentation, Colorado State University, November 2006

[1] *Numerical Continuation and Bratu's Equation*, Departmental Greenslope Seminar, Colorado State University, March 2005

Graduate Interdisciplinary Experience

Served as project team manager for an interdisciplinary research team for the PRIMES program. The team studied latent processes in generalized linear models used to de-list grizzly bears in the greater Yellowstone ecosystem. **Su. 2006**

Graduate Teaching Experience

Prof., University of Colorado Denver **Fa. 2023 - present**
Assoc. Prof., University of Colorado Denver **Sp. 2019 - Sp. 2023**
Asst. Prof., University of Colorado Denver **Sp. 2014 - Sp. 2019**
Instructor, Colorado State University **Fa. 2008**

- *MATH 7384: Mathematical Probability* **Sp. 2021**
- *Math 5027: Foundations of Analysis* **Fa. 2019, Fa. 2020**
- *Math 8660: Mathematical Foundations of Finite Element Methods* **Sp. 2019**
- *MATH 5733: Partial Differential Equations* **Sp. 2017, Sp. 2022, Sp. 2023**
- *MATH 7827: Topics in Computational Mathematics* **Sp. 2016**
- *MATH 6131: Real Analysis* **Sp. 2015**
- *MATH 5070: Applied Analysis* **Fa. 2014, Fa. 2017**
- *MATH 7663: Finite Difference Methods for Partial Differential Equations* **Sp. 2014**
- *Short Course: A new approach to stochastic inverse problems for scientific inference* **Su. 2016**
  Co-designed (with Dr. Don Estep from CSU) a series of lectures on the formulation and solution of stochastic inverse problems using measure theory. Includes hands-on tutorials of the BET software.
- *Short Course: Sensitivity Analysis* **Fa. 2008**
  Designed and taught three week course on sensitivity analysis aimed at graduate students studying ecology, statistics, and mathematics while a graduate student at Colorado State University. Responsible for the creation of lectures and MATLAB code exploring topics in forward and inverse sensitivity analysis using examples taken from articles in ecological journals.

Undergraduate Teaching Experience

Prof., University of Colorado Denver **Fa. 2023 - present**
Assoc. Prof., University of Colorado Denver **Sp. 2019 - Sp. 2023**
Asst. Prof., University of Colorado Denver **Sp. 2014 - Sp. 2019**
Instructor, Colorado State University **2003-2008, Fa. 2012**
Instructor, The University of Texas at Austin **Fa. 2011**

- *MATH 4733: Partial Differential Equations* **Sp. 2022, Sp. 2023**
- *MATH 1376: Programming for Data Science* **Fa. 2020, Sp. 2021, Su. 2021, Fa. 2022**
- *MATH 1401: Calculus I* **Sp. 2018, Fa. 2018**
- *MATH 3195: Linear Algebra and Differential Equations* **Fa. 2015, Fa. 2016**
- *MATH 4310: Introduction to Real Analysis I* **Sp. 2014, Fa. 2015, Fa. 2018**

- *STAT 315: Statistics for Engineers and Scientists* **Fa. 2012 - Sp. 2013**
- *ASE311: Engineering Computation* **Fa. 2011**
- *M340: Ordinary Differential Equations* **Sp. 2008**
- *M261: Calculus III for Physical Sciences (multi-variable calculus)* **Su. 2005**
- *M161: Calculus II for Physical Sciences* **Sp. 2005**
- *M160: Calculus I for Physical Sciences* **Fa. 2003, Sp. 2003, Fa. 2004**
- *M130: Math in the Social Sciences* **Su. 2004**

ADVISING

Graduate Advisor, CU Denver and UT Austin

- Scott Walsh, Ph.D. student (CU Denver) **Sp. 2014 - Su. 2017**
- Michael Pilosov, Ph.D. student (CU Denver) **Sp. 2015 - Fa. 2020**
- Tian Yu Yen, Ph.D. student (CU Denver) **Su. 2017 - Su. 2021**
- Wenjuan Zhang, Ph.D. student (CU Denver) **Su. 2018 - Su. 2021**
- Alex Dorio, M.S. student (CU Denver) **Fa. 2018 - Sp. 2019**
- Carlos del-Castillo-Negrete, Ph.D. student (UT Austin) **Sp. 2020 - Fa. 2023**
- Kirana Bergstrom, Ph.D. student (CU Denver) **Su. 2020 - Su. 2024**
- River Bond (deceased), Ph.D. student (CU Denver) **Su. 2020 - Su. 2023**
- Taylor Roper, Ph.D. student (CU Denver) **Su. 2020 - Su. 2024**
- Rylan Spence, Ph.D. student (UT Austin) **Fa. 2022 - present**
- João Vitor de Oliveira Silva, Ph.D. student (CU Denver) **Fa. 2023 - present**

T.A. Mentor, University of Colorado Denver

Teaching mentor for graduate students serving as teaching assistants within the department.

- Trever Hallock **Fa. 2016 - Sp. 2017**
- Minh Chau Nguyen **Sp. 2016**
- James Haley **Fa. 2015**

SERVICES TO PROFESSION

Proposal Reviews

- National Science Foundation Panel (Sp. 2017, Sp. 2023) and ad hoc reviewer (Fa. 2020)
- Department of Energy ad hoc reviewer (Su. 2023)

Conference/Workshop organizer/co-organizer

- Rocky Mountain Summer Workshop on Uncertainty Quantification, University of Colorado Denver, July 15–17, 2015

Minisymposia organizer/co-organizer

- Discovering and Exploiting Low-dimensional Structures in Computational Models, SIAM Conference on Computational Science and Engineering, Spokane, WA, February/March, 2019
- New Methodologies for Uncertainty Quantification and Applications to the Geosciences, SIAM Annual Meeting, Portland, OR, July, 2018
- Uncertainty Quantification and Modeling for Complex Applications, 2018 International Applied Computational Electromagnetics Society Symposium, Denver, CO, March, 2018
- Adaptive Methods for Uncertainty Quantification and Error Estimation, SIAM Conference on Computational Science & Engineering, Atlanta, GA, March, 2017
- Solution of Large-Scale Inverse Problems, European Congress on Computational Methods in Applied Sciences and Engineering, Crete, Greece, July, 2016
- Error Analysis and Scalability of UQ Methodologies for Inverse Problems, SIAM Conference on Computational Science & Engineering, Salt Lake City, UT, March, 2015

- Inverse Problems for Coastal Engineering and Subsurface Flow, SIAM Annual Conference, Chicago, IL, July, 2014
- A Posteriori Error Estimation for Reliable Uncertainty Quantification, SIAM Conference on Uncertainty Quantification, Raleigh, NC, April, 2012

Journal referee:

- SIAM/ASA Journal on Uncertainty Quantificaiton (4 total) – 2016 (1), 2015 (2), 2014 (1)
- SIAM Journal on Numerical Analysis (2 total) – 2017 (1), 2009 (1)
- Computational Geosciences (24 total) – 2023 (1), 2022 (1), 2019 (2), 2018 (2), 2017 (1), 2016 (3), 2015 (1), 2014 (1), 2013 (4), 2012 (2), 2011 (5), 2010 (1)
- SIAM Journal on Scientific Computing (10 total) – 2022 (1), 2020 (1), 2019 (2), 2018 (3), 2017 (1), 2013 (2)
- Journal of Computational Physics (6 total) – 2020 (2), 2019 (1), 2015 (2), 2013 (1)
- Journal of Scientific Computing (1 total) – 2022 (1)
- Journal of Applied Meteorology and Climatology (4 total) – 2016 (1), 2015 (1), 2014 (1), 2013 (1)
- Inverse Problems in Science & Engineering (1 total) – 2014 (1)
- International Journal for Numerical Methods in Engineering (6 total) – 2020 (2), 2016 (2), 2015 (1), 2014 (1)
- International Journal for Uncertainty Quantification (4 total) – 2022 (1), 2021(1), 2020 (2)
- Inverse Problems (5 total) – 2023 (1), 2017 (1), 2015 (1), 2014 (2)
- Advances in Water Resources (3 total) – 2016 (1), 2015 (2)
- Water Resources Research (2 total) – 2018 (1), 2017 (1)
- Applied Computational Electromagnetics Society (3 total) – 2017 (3)
- Computer Methods in Applied Mechanics and Engineering (6 total) – 2024 (7), 2023 (3), 2018 (1), 2023 (2)
- Royal Society Open Science (2 total) – 2023 (2)
- Monthly Weather Review (1 total) – 2024 (1)
- GeoInformatica (1 total) – 2024 (1)

Services to Department & Campus

Associate Chair, Department of Mathematical & Statistical Sciences, University of Colorado Denver **Fa. 2021 - Su. 2023**

Instructional Support Committee (chair), Department of Mathematical & Statistical Sciences, University of Colorado Denver **Fa. 2020 - Sp. 2021**

LETTS Committee (member, secretary), Faculty Assembly Committee, University of Colorado Denver **Fa. 2018 - Sp. 2021**

LGBTQ+ Committee (member), Faculty Assembly Committee, University of Colorado Denver **Fa. 2017 - Sp. 2020**

Director, Center for Computational Mathematics (CCM) **Fa. 2014 - Su. 2017**

By-laws committee (member), Department of Mathematical & Statistical Sciences, University of Colorado Denver **Fa. 2015 - Sp. 2016**

Executive committee (member), Department of Mathematical & Statistical Sciences, University of Colorado Denver **Fa. 2020 - present**

Search committees, University of Colorado Denver

- **Computational Math**, Mathematical & Statistical Sciences **Fa. 2016 - Sp. 2017**
  Member of search committee for Asst. Prof. position in computational mathematics.

- **Computational Math**, Mathematical & Statistical Sciences **Fa. 2014 - Sp. 2015**
  Member of search committee for Asst. Prof. position in computational mathematics.
- **Statistics**, Mathematical & Statistical Sciences **Fa. 2013 - Sp. 2014**
  Member of search committee for Asst. Prof. position in statistics.

Student graduate degree committees
I have served as both a member on several committees for student graduate degrees within the department and as an external member for other departments and universities. (Stopped tracking new committees for students after Sp. 2018.)

- Yuanlong Wang, Hamad Abdalkaleg, Asma Shaibob, and Alexa Desautels, M.S., CU Denver **2018**
- Samual Estes, Ph.D. (external member), UT-Austin **Fa. 2017 - Fa. 2019**
- Yuanlong Wang, Ph.D. (external member), UC-Denver **Fa. 2016 - Fa. 2018**
- Hamad Abdalkaleg, Ph.D. (external member), UC-Denver **Sp. 2016 - Fa. 2018**
- Lindley Graham, Ph.D. (external member), UT-Austin **Sp. 2014 - Su. 2015**
- Ali Lotfi, M.S., CU Denver, **Sp. 2015**
- Stephanie Patterson, M.S., CU Denver **Fa. 2014**
  Ph.D., CU Denver **Fa. 2014 - Fa. 2016**
- Evan Kwiatkowski, M.S., CU Denver **Sp. 2014**

Faculty colloquium organizer, University of Colorado Denver **Fa. 2013 - Sp. 2015**
Organized departmental faculty colloquium including scheduling and inviting speakers within the department to share research broadly to all departmental faculty and graduate students.

Analysis Preliminary Exam Committee, University of Colorado Denver
Have served as both a member and as the chair.

- Chair **Fa. 2016 - Su. 2017, Fa. 2021 - Sp. 2022**
- Member **Fa. 2013 - Su. 2016, Fa. 2017 - Su. 2018**

Graduate Committee (member), University of Colorado Denver
Reviewed curricula, program requirements, recruited graduate students, organized faculty seminars for undergraduates at other universities to improve recruitment, organized meetings between faculty and industry representatives to form collaborative research/educational grants.

- Member **Fa. 2013 - Su. 2015, Fa. 2016 - Su. 2017, Fa. 2018 - Fa. 2019**

Mentor for Ph.D students, The University of Texas at Austin
Served as a mentor for Dr. Clint Dawson's Ph.D students Talea Mayo (Fa. 2009 - Fa. 2013) and Lindley Graham (Fa. 2011 - Su. 2015). Aided in Talea Mayo's research of data assimilation using ensemble Kalman filters. Aidied Lindley Graham's research of novel UQ methods and interfacing to ADCIRC model framework in an HPC environment.

GTA Mentor, Colorado State University **2008 - 2009**
Chosen by faculty as one of three senior graduate students to serve as a graduate teaching assistant (GTA) mentor in the pilot mentoring program. Responsible for observing, advising, and giving feedback on lesson planning and lectures to three first year GTAs.

Graduate Student Representative, Colorado State University **2007 - 2008**
Voted position by graduate student body in mathematics to represent graduate student interests and serve as an advocate for graduate students on the departmental graduate committee.

Math Day Volunteer, Colorado State University **2003 - 2009**
Served as timer and set up rooms. This is an annual event to promote interest and reward excellence in high school mathematics, strengthen ties and encourage communication between high school mathematics programs and the Department of Mathematics at Colorado State University, and recruit excellent mathematics students to Colorado State University.

Memberships

Society for Industrial and Applied Mathematics (SIAM) **2009-present**

American Mathematics Society **2003-2012**

Awards/Honors

Open Educational Resources (OER) Champion **2023**
University of Colorado system-wide award for leading OER efforts in 2022.

Teaching Award **2023**
College of Liberal Arts and Sciences award for outstanding teaching over the 2020-2022 period.

Research/Creative Activities Award **2021**
College of Liberal Arts and Sciences award for outstanding research over the 2018-2020 period.

ICES Postdoctoral Fellowship **Fa. 2009 - Su. 2011**
Two-year research fellowship awarded by ICES at the University of Texas at Austin.

Interdisciplinary Research Trainee **Fa. 2005, Sp. 2006, Fa. 2006 - Su. 2007**
Source of Support: NSF IGERT Grant DGE-0221595, Program for Interdisciplinary Mathematics, Ecology, and Statistics (PRIMES).
Served as project team manager for an interdisciplinary research team for the PRIMES program. The team studied latent processes in generalized linear models used to de-list grizzly bears in the greater Yellowstone ecosystem. **Su. 2006**

Graduate Teaching Award **2004-2005**
Award voted by departmental faculty for outstanding instruction by a graduate student.