

Travis M. Williams

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Education

- M.A. University of Colorado**, Geography Boulder, CO Aug 2018
- Focus: Climate Risk Management, Drought, Research, Geospatial Modeling.
 - Advisors: William R. Travis, Stefan Leyk, Barbara P. Buttenfield
 - Thesis: *Drought Index-Based Insurance for the US Cattle Ranching Industry*
 - Cumulative GPA: 3.90
- B.S. Florida State University**, Geography Tallahassee, FL Aug 2009
- Focus: GIS, Ecology, French
 - Minors: Biology, French
 - Cumulative GPA: 3.39

Experience

- National Renewable Energy Laboratory**, Researcher III - Geospatial Data Science Golden, CO Nov 2019 – Present
- My primary role at NREL is centered on the Renewable Energy Potential Model (reV). I have been the technical lead on this model since 2020 (shortly after it was open-sourced). Secondary roles at NREL include the development of other research models, data management, analysis, research, writing, and visualization for energy systems research projects.
- Designing analysis projects, collecting or building input data, and running models on NREL HPC systems
 - Manage the reV model's maintenance budget
 - Manage the reV models input data collection, filesystem, and compute environment on the HPC
 - Train employees on reV and HPC
 - Support and help existing users
 - Interface with clients who want to use it with their own infrastructure
 - Interface with the software developers (and periodically contribute to the software)

- University of Colorado - Geography Dept.**, Research Assistant/Visiting Researcher Boulder, CO Jan 2017 – Nov 2019
- Worked with a group called Earth Lab studying drought, fire, and agriculture.
- Co-authored literature review publication on adaptive ranching practices and drought information.
 - Applied econometric methods to discover climate signals in a large market data set.
 - Redesigned an existing rainfall insurance system to better manage drought-related agricultural risks.
 - Developed and deployed interactive online risk management and decision-making tools.
 - Generated descriptive charts, maps, and other graphical products.
 - Built the Python package implementing the FIRED event delineation algorithm (firedpy)

- University of Colorado - Geography Dept.**, Teaching Assistant Boulder, CO Aug 2016 – Dec 2017
- Taught recitations for groups of 25-30 students.
- Geography of the Environment and Society & World Geography

- Topics included Human-Earth system interactions, theories of resource management, and natural hazard mitigation.
- Combination of content review, group activity, and grading.
- Focused on connecting course content with current events and engaging students in discussion.
- Features of 5 major world regions with a particular focus on culture and social injustice.

Southern Illinois University - Plant, Soil, & Ag. Systems Dept., Research Assistant

Soil sampling, laboratory tests, GIS analysis, research, & writing.

Carbondale, IL
Apr 2014 – May 2016

- Collected plant tissue and soil samples with Truck Mounted Soil Probe, SPAD and other devices.
- Performed KCL extractions and other laboratory tests for agricultural chemicals content.
- Collected and interpreted climate data and site information for a large meta-analysis of high-yield fertilizer studies across the Midwest using various GIS programs.
- Used ArcGIS and SAS to perform spatial analysis into the performance of a no-till and cover crop study concurrent with extensive research into the practices

Various, Various

Various jobs in retail, environmental protection, landscaping, a rock masonry company, a boarding school, etc.

FL, NC, & IL
Aug 2003 – Apr 2014

- Lived and worked for a year off-grid in near Blackforest, NC
- Lived and worked for a few years on a family ranch near Vienna, IL
- etc

Projects

Drought Index Portal (DrIP)

Jan 2017 – Nov 2019

An interactive data portal for comparing drought indices and exploring historical drought in the United States.

- <https://droughtindexportal.colorado.edu>
- Interactive map and timeseries compares 42 different indicators of drought.
- Flexible enough to compare any two drought indices at any point, across any time period since 1900 or one index at multiple points and time periods.
- Allows user to easily identify the severity and geographic extent worse historical droughts in the US to compare with current conditions.
- Was built with less than two years of experience in programming.

reView

Jan 2021 – Present

Another interactive data portal, this time to review outputs from the Renewable Energy Potential Model (reV).

- Renders spatial, statistical, and temporal outputs from reV model runs.
- Links location and graph visualization

Skills

GIS Interfaces: QGIS, ArcMap, GRASS, & DIVA GIS

Programming Languages: Python, R, SQL, Bash, C, C++, HTML

Geospatial Data Tools: Geospatial Abstraction Library (GDAL), Rasdaman, PostGIS

Research & Data Analysis: Geospatial Analysis, Renewable Energy Technical Potential Modeling, Natural Hazards and Insurance (particularly drought), Soil Science, Econometrics

Etc.: Blender, OBS-Studio, Linux, SLURM, General Cartography

Publications

Managing climate risks on the ranch with limited drought information	02/22/2018
Trisha Shrum, William Travis, Travis Williams, and Evan Lih	
Climate Risk Management 20, 11-26	
www.sciencedirect.com/science/article/pii/S2212096317301407?via%3Dihub	
Drought Index-based Insurance for the US Cattle Ranching Industry	08/15/2018
Travis Williams	
University of Colorado - Dissertations and Theses: 10843790	
www.proquest.com/openview/85fc8e0e239dd79f9bcf646536cb338d/1?pq-origsite=gscholar&cbl=18750	
Evaluating Alternative Drought Indicators in a Weather Index Insurance Instrument	06/01/2019
Travis Williams and William Travis	
American Meteorological Society: Weather, Climate, and Society 11(3), 629-649	
doi.org/10.1175/WCAS-D-18-0107.1	
FIRED (Fire Events Delineation): An Open, Flexible Algorithm and Database of US Fire Events Derived from the MODIS Burned Area Product (2001–2019)	10/24/2020
Jennifer Balch, Lise St. Denis, Adam Mahood, Nathan Mietkiewicz, Travis Williams, Joe McGlinchy, and Maxwell Cook	
Remote Sensing 12(21),3498	
doi.org/10.3390/rs12213498	
The Renewable Energy Potential (reV) Model: A Geospatial Platform for Technical Potential and Supply Curve Modeling	06/01/2021
Galen MacLaurin, Nick Grue, Anthony Lopez, Donna Heimiller, Michael Rossol, Grant Buster, and Travis Williams	
National Renewable Energy Laboratory, NREL/TP-6A20-73067	
docs.nrel.gov/docs/fy19osti/73067.pdf	
Land Use and Turbine Technology Influences on Wind Potential in the United States	05/15/2021
Anthony Lopez, Trieu Mai, Eric Lantz, Dylan Harrison-Atlas, Travis Williams, and Galen MacLaurin	
Energy 223, 210044	
doi.org/10.1016/j.energy.2021.120044	
2021 Standard Scenarios Report: A U.S. Electricity Sector Outlook	11/01/2021
Wesley Cole, J. Carag, Maxwell Brown, Patrick Brown, Stuart Cohen, Kelly Eurek, Will Frazier, Pieter Gagnon, Nick Grue, Jonathan Ho, Anthony Lopez, Trieu Mai, Matthew Mowers, Caitlin Murphy, Brian Sergi, Dan Steinberg, and Travis Williams	
National Renewable Energy Laboratory, NREL/TP-6A40-80641	
doi.org/10.2172/1834042	
Wind Energy Costs in Puerto Rico Through 2035	09/01/2022
Patrick Duffy, Gabriel Zuckerman, Travis Williams, Alicia Key, Luis Martinez-Tossas, Owen Roberts, Nina Choquette, Jaemo Yang, Haiku Sky, and Nate Blair	
National Renewable Energy Laboratory, NREL/TP-6A40-83434	
doi.org/10.2172/1891213	
Turbine Scale and Siting Considerations in Wind Plant Layout Optimization and Implications for Capacity Density	03/07/2022
Andrew Stanley, Owen Roberts, Anthony Lopez, Travis Williams, and Aaron Barker	
Energy Reports 8, 3507-3525	
doi.org/10.1016/j.egyr.2022.02.226	
National-Scale Impacts on Wind Energy Production under Curtailment Scenarios to Reduce Bat Fatalities	05/24/2022
Galen MacLaurin, Cris Hein, Travis Williams, Owen Roberts, Eric Lantz, Grant Buster, and Anthony Lopez	
Wind Energy 25(9)	

doi.org/10.1002/we.2741

Exploring the Impact of Near-Term Innovations on the Technical Potential of Land-Based Wind Energy

03/01/2023

Owen Roberts, Travis Williams, Anthony Lopez, Galen MacLaurin, and Annika Eberle

National Renewable Energy Laboratory, NREL/TP-500-81664

doi.org/10.2172/1963405

Impacts of Siting Considerations on Offshore Wind Technical Potential in the United States

07/01/2023

Gabriel Zuckerman, Anthony Lopez, Travis Williams, Rebecca Green, and Grant Buster

National Renewable Energy Laboratory, NREL/TP-6A40-85088

doi.org/10.2172/1989233

Impact of Siting Ordinances on Land Availability for Wind and Solar Development

08/03/2023

Anthony Lopez, Wesley Cole, Brian Sergi, Aaron Levine, Jesse Carey, Cailee Mangan, Trieu Mai, Travis Williams, Pavlo Pinchuk, and Jianyu Gu

Nature Energy 8, 1024-1043

doi.org/10.1038/s41560-023-01319-3

Estimating National-Scale Wind Potential Using Spatially Explicit Turbine Layout Optimization

10/01/2023

Anthony Lopez, P. J. Stanley, Owen Roberts, Trieu Mai, Travis Williams, Pavlo Pinchuk, Grant Buster, and Eric Lantz

National Renewable Energy Laboratory, NREL/TP-6A20-85075

doi.org/10.2172/2203429

Incorporating Wind Turbine Choice in High-Resolution Geospatial Supply Curve and Capacity Expansion Models

01/15/2024

Annika Eberle, Trieu Mai, Owen Roberts, Travis Williams, Pavlo Pinchuk, Anthony Lopez, Matthew Mowers, Joseph Mowers, Tyler Stehly, and Eric Lantz

National Renewable Energy Laboratory, NREL/TP-6A20-87161

doi.org/10.2172/2283923

Solar Photovoltaics and Land-Based Wind Technical Potential and Supply Curves for the Contiguous United States: 2023 Edition

01/07/2024

Anthony Lopez, Pavlo Pinchuk, Michael Gleason, Wesley Cole, Trieu Mai, Travis Williams, Owen Roberts, Marie Rivers, Mike Bannister, Sophie-Min Thomson, Gabe Zuckerman, Brian Sergi

National Renewable Energy Laboratory, NREL/TP-6A20-87843

doi.org/10.2172/2283517

2023 Standard Scenarios Report: A U.S. Electricity Sector Outlook

01/15/2024

Pieter Gagnon, An Pham, Wesley Cole, Sarah Awara, Anne Barlas, Maxwell Brown, Patrick Brown, Vincent Carag, Stuart Cohen, Anne Hamilton, Jonathan Ho, Sarah Inskeep, Akash Karmakar, Luke Lavin, Anthony Lopez, Trieu Mai, Joseph Mowers, Matthew Mowers, Caitlin Murphy, Paul Pinchuk, Anna Schleifer, Brian Sergi, Daniel Steinberg, and Travis Williams

National Renewable Energy Laboratory, NREL/TP-6A20-87724

doi.org/10.2172/2274777

Puerto Rico Grid Resilience and Transitions to 100% Renewable Energy Study (PR100): Final Report

03/01/2024

Murali Baggu, Robin Burton, Nate Blair, Manajit Sengupta, Tom Harris, Clayton Barrows, Haiku Sky, Vahan Gevorgian, Jeremy Keen, Elena Smith, Mike Campton, Sushmita Jena, Jaemo Yang, Travis Williams, Paritosh Das, James Elsworth, Prateek Joshi, Cameron Weiner, James Morris, Joseph McKinsey, Surya Chandran, Dhulipala, Sam Molnar, Weihang Yan, Pranav Sharma, Wenbo Wang, Aadil Latif, Daniel Thom, Sourabh Dalvi, Ian Baring-Gould, Matthew Lave, Amanda Wachtel, C. Birk Jones, Emily Moog, Andrea Mammoli, Richard Garrett, Thad Haines, Will Vining, Cody Newlun, Olga Hart, Marcelo Elizondo, Xiaoyuan Fan, Patrick Maloney, Alok Bharati, Bharat Vyakaranam, Vishvas Chalishazar, Patrick Royer,

Fernando Bereta dos Reis, Xue (Michelle) Li, Kaveri Mahapatra, Jeff Dagle, Xinda Ke, Meng Zhao, Orestis Vassios, Tycko Franklin, Michael Abdelmalak, Kishan Guddanti, Samrat Acharya, Marcos Cruz, Pavel Etingov, Chuan Qin, Juan Carlos Bedoya, Tony Nguyen, Sraddhanjoli Bhadra, Ahmad Tbaileh, Laura Ward, Victoria Sinnott, Pablo Mendez-Curbelo, Peter Cappers, Jeff Deason, Margaret Pigman, Lawrence Paul Lewis, John T. Murphy, Tomaz Kobayashi-Carvalhaes, Melanie Bennett, Yilu Liu, Harvey Cutler, Martin Shields, Hwayoung Jeon, and Michele Chait

National Renewable Energy Laboratory, NREL/TP-6A20-88384

doi.org/10.2172/2335361

The interplay of future solar energy, land cover change, and their projected impacts on natural lands and croplands in the US

10/15/2024

Jay Diffendorfer, Brian Sergi, Anthony Lopez, Travis Williams, Michael Gleason, Zach Ancona, Wesley Cole
Science of the Total Environment 947, 173872

doi.org/10.1016/j.scitotenv.2024.173872

System-cost-minimizing deployment of PV-wind hybrids in low-carbon U.S. power systems

07/01/2024

Patrick Brown, Travis Williams, Maxwell Brown, and Caitlin Murphy
Applied Energy 365, 123151

doi.org/10.1016/j.apenergy.2024.123151

Renewable Energy Technical Potential and Supply Curves for the Contiguous United States: 2024 Edition

01/07/2024

Anthony Lopez, Gabriel Zuckerman, Pavlo Pinchuk, Michael Gleason, Marie Rivers, Owen Roberts, Travis Williams, Donna Heimiller, Sophie-Min Thomson, Trieu Mai, and Wesley Cole
National Renewable Energy Laboratory, NREL/TP-6A20-91900

doi.org/10.2172/2500362

Winds of Change: A Study of Future Wind Energy Resources and Cost Uncertainties Across the United States (Under Review)

11/20/2025

Grant Buster, Owen Roberts, Travis Williams, and Tyler Stehly
Nature Energy

Extracurricular Activities

- Building PCs
- Linux