

Curriculum Vitae – January 2024

William Merritt Shobe

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EDUCATION

Ph.D.	1991	Dept. of Economics, Univ. of Minnesota, Minneapolis, MN
J.D.	1980	Lewis & Clark Law School, Portland, OR
B.A.	1976	Vanderbilt University, Nashville, TN

MAJOR AREAS OF INTEREST

- Market design in emission trading programs
- Carbon removal technologies for reducing global warming
- Electricity sector transformation
- Integrated assessment modeling
- Environmental federalism

CURRENT PROJECTS

UVA Energy Transition Initiative

Emission market design

Modeling carbon removal technologies as a tool for addressing climate change

Assessing disproportionate effects of the energy transition on historically disadvantaged communities

Benefit-cost analysis of subway injury prevention devices

Swedish procurement auctions for bio-energy with carbon capture and sequestration

CURRENT EMPLOYMENT**University of Virginia**

- **Dir. of Economic and Policy Studies at the Weldon Cooper Center for Public Service**
- **Research Prof. of Public Policy, Frank Batten School of Leadership and Public Policy**
- **Adjunct Professor, Dept. of Economics**

Research projects include emission markets, environmental federalism, integrated assessment modeling, state regulatory policy, state public finance, decarbonization policies and pathways, environmental policy, occupational licensing programs, and economic development.

Teaching responsibilities: environmental economics (undergraduate, Economics Dept.), cost/benefit analysis, public policy, statistics, environmental policy (masters, Batten School of Public Policy).

PRIOR EMPLOYMENT

Sep 2000 – Jan 2001 Fulbright Fellow in Environmental Economics, University of Economics, Prague, Czech Republic

Jul 1995 – Aug 2004 Associate Director for Economic & Regulatory Analysis, Virginia Department of Planning and Budget

Responsibilities: benefit-cost analysis of regulations with special emphasis on environmental regulations, forecasting state expenditures and revenues, and special research projects. Created the concept and managed the development of the Virginia Regulatory Town Hall website.

Implemented Virginia's June 2004 auction of nitrogen oxide emission allowances, the first of its kind, which raised \$10.5 million dollars. Managed the preparation of Medicaid and TANF expenditure forecasts and headcount forecasts for higher education. Chaired the committee for forecasting prison and jail headcounts. The Virginia's Regulatory Town Hall was the first in the nation web site for managing and publicizing state regulatory development. This site was honored with a "2002 Best-of-Breed" award from the Center for Digital Government, the 2002 Colborn Award (for innovation) from the National Association of Secretaries of State, and the 2003 Public Access to Government Information Award from the National Association of Law Libraries.

Aug 2003 - Dec 2003 Adjunct Assistant Professor, Dept. of Economics, Virginia Commonwealth University

Jan 2000 - May 2001 Adjunct Professor, Dept. of Agricultural & Applied Economics, Virginia Tech

Aug 1989 - Jun 1995 Assistant Professor, Dept. of Economics, Univ. of North Carolina at Greensboro

Feb 1994 - Jun 1994 Consultant, North Carolina Department of Environment, Health and Natural Resources

Sep 1987 - Jul 1988 Research Associate, Office of Tax Policy Research, Univ. of Michigan, Ann Arbor, MI

- Feb 1981 - Mar 1981 Research Associate, Risk Management Project, Council on Environmental Quality, Executive Office of the President, Washington, D.C.
- May 1980 - Dec 1980 Legal Research Associate, Office of Toxic Substances, U.S. Environmental Protection Agency, Washington, D.C.

PUBLICATIONS AND REPORTS

- Regional implications of carbon dioxide removal in meeting net zero targets for the United States (2023). Fauvel1, C., Fuhrman, J., Ou, Y., Shobe, W., Doney, S., McJeon, H., and Clarens, A. *Environmental Research Letters*, Vol. 18, No. 9.
- Diverse carbon dioxide removal approaches could reduce impacts on the energy–water–land system. *Nature Climate Change*. 13, 341–350 (2023). Fuhrman, J., Bergero, C., Weber, M., Monteith, S., Wang, F., Clarens, A., Doney, S., Shobe, W., and McJeon, H.
- The Effects of Seemingly Nonbinding Price Floors: An Experimental Analysis (2023) Stephen Salant, William Shobe, Neslihan Uler. *European Economic Review*, Vol. 159 (October). DOI: [10.1016/j.euroecorev.2023.104583](https://doi.org/10.1016/j.euroecorev.2023.104583)
- Price-Responsive Supply in Emission Markets (2022). Dallas Burtraw, Charles Holt, Karen Palmer, William Shobe. *J. of the Assoc. of Env. and Res. Econ.* Vol. 8, No. 5. DOI: [10.1086/720690](https://doi.org/10.1086/720690)
- The Effects of ‘Nonbinding’ Price Floors (2022) Stephen Salant, William Shobe, Neslihan Uler. *European Economic Review*, Vol. 145 (June). DOI: [10.1016/j.euroecorev.2022.104122](https://doi.org/10.1016/j.euroecorev.2022.104122).
- State-Level Planning for Decarbonization: Critical Elements of Effective State Action (2022) Maya Domeshek, Thomas Bowen, Chrissie Ivanova, Karen Palmer, and William Shobe. Resources for the Future Report 22-10.
- Achieving Clean Electricity Generation at Least Cost to Ratepayers by 2045 (Dec. 2021). W. Shobe, A. Artuso, M. Domeshek. Weldon Cooper Center for Public Service. [Permanent link](#).
- The role of negative emissions in meeting China’s 2060 carbon neutrality goal (2021) Jay Fuhrman, Andrés F. Clarens, Haewon McJeon, Pralit Patel, Yang Ou, Scott C. Doney, William M. Shobe, Shreekar Pradhan. *Oxford Open Climate Change*, Vol. 1, No. 1.
- The role of direct air capture and negative emissions technologies in the Shared Socioeconomic Pathways towards 1.5 deg. C and 2 deg. C futures (2021) J. Fuhrman, A. Clarens, K. V. Calvin, S. C. Doney, J. A. Edmonds, P. O’Rourke, P. L. Patel, S. Pradhan, W. Shobe, and H. C. McJeon. *Environmental Research Letters* 16 114012.

- Values-Based Scenarios of Water Security: Rights to Water, Rights of Waters, and Commercial Water Rights (2021) W. Jenkins, L. Rosa, J. Schmidt, L. Band, A. Beltran-Pena, A. Clarens, S. Doney, R. E. Emanuel, A. Glassie, J. Quinn, M. C. Rulli, W. Shobe, L. Szeptycki, and P. D’Odorico. *BioScience* 71, 11 [10.1093/biosci/biab088](https://doi.org/10.1093/biosci/biab088).
- Decarbonizing Virginia’s Economy: Pathways to 2050 (Jan. 2021). W. Shobe, A. Artuso, B. Haley, G. Kwok, A. Small. Weldon Cooper Center for Public Service. [Permanent link](#).
- Food–energy–water implications of negative emissions technologies in a +1.5 °C future (2020). Jay Fuhrman, Haewon McJeon, Scott Doney, William Shobe and Andrés Clarens. *Nature Climate Change*, Vol. 10, pp 920-927. DOI: [10.1038/s41558-020-0876-z](https://doi.org/10.1038/s41558-020-0876-z)
- Emerging Issues in Decentralized Resource Governance: Environmental Federalism, Spillovers, and Linked Socio-Ecological Systems (2020). William Shobe. *Annual Review of Resource Economics*, Vol. 12, pp 259-279. DOI: [10.1146/annurev-resource-110319-114535](https://doi.org/10.1146/annurev-resource-110319-114535)
- From Zero to Hero?: Why Integrated Assessment Modeling of Negative Emissions Technologies Is Hard and How We Can Do Better (2019). Jay Fuhrman, Haewon McJeon, Scott Doney, William Shobe and Andrés Clarens. *Frontiers in Climate*, Vol. 1. DOI: 10.3389/fclim.2019.00011
- The Regional Greenhouse Gas Initiative: How Virginia is Limiting its Carbon Emissions (2018). William Shobe. *The Virginia News Letter*, Vol. 94, No. 4.
- Price and Quantity Collars for Stabilizing Emissions Allowance Prices: An Experimental Analysis (2016). Charles Holt and William Shobe, *Journal of Environmental Economics and Management*. Vol. 80, pp. 69-86. DOI: <https://doi.org/10.1016/j.jeem.2016.01.003>
- The Economic Impacts of Positive Feedbacks Resulting from Deforestation (2015). Chrissy Runyan, Paolo D’Odorico, William Shobe, *Ecological Economics*. Vol. 120, pp. 93-99.
- Dominion Virginia Power and Clean Power Plan Costs: A brief review of the Dominion Power 2015 Integrated Resource Plan compliance cost estimates* (2015). William Shobe. Charlottesville: Center for Economic and Policy Studies, Univ. of Virginia. Report #15-02.
- Report on Appendix A-1 of the Virginia Energy Plan: Impacts of Proposed Regulations under Section 111(d) of the Clean Air Act* (2015). William Shobe, Center for Economic and Policy Studies, Univ. of Virginia. Report #15-01.
- Elements of emission market design: an experimental analysis of California’s market for greenhouse gas allowances (2014). William Shobe, Charles Holt and Thaddeus Huetteman. *Journal of Economic Behavior and Organization*. Vol. 107, pp. 402–420.

- Investigation of the Effects of Emission Market Design on the Market-Based Compliance Mechanism of the California Cap on Greenhouse Gas Emissions (2013). Charlottesville: Center for Economic and Policy Studies, University of Virginia.
- Rethinking Environmental Federalism in a Warming World. (2012). William Shobe and Dallas Burtraw. *Climate Change Economics*, Vol. 3, No. 4, pp. 1-33.
- Oral Health and the Dental Care Workforce in Southwest Virginia* (2011), Tanya Wanchek, Terrence Rephann, and William Shobe, Charlottesville: Center for Economic and Policy Studies, University of Virginia.
- Price Discovery in Emissions Permit Auctions (2011). Dallas Burtraw, Charlie Holt, Erica Myers, Jacob Goeree, Karen Palmer, and William Shobe, in R. Mark Isaac, Douglas A. Norton (ed.) *Experiments on Energy, the Environment, and Sustainability (Research in Experimental Economics, Volume 14)*, Emerald Group Publishing Limited, pp.11-36.
- A Database for a Changing Economy: Review of the Occupational Information Network (O*NET)* (2010). Nancy T. Tippins and Margaret L. Hilton, Editors; Report of the Panel to Review the Occupational Information Network; Washington DC: National Research Council.
- An Experimental Analysis of Auctioning Emissions Allowances under a Loose Cap (2010). William Shobe, Dallas Burtraw, Charlie Holt, Jacob Goeree, Karen Palmer, and Erica Myers. *Agricultural and Resource Economics Review*, Vol. 39, No. 2, pp. 162-175.
- An Experimental Analysis of Auctions versus Grandfathering to Assign Pollution Permits (2010). Jacob Goeree, Karen Palmer, Charles Holt, William Shobe, Dallas Burtraw. *Journal of the European Economic Association*, Vol. 8, No. 2-3, pp. 514–525.
- Collusion in Auctions for Emission Permits: An Experimental Analysis (2009). Dallas Burtraw, Charlie Holt, Jacob Goeree, Karen Palmer and Erica Myers, and William Shobe. *Journal of Policy Analysis & Management*, Vol. 28, No. 4, pp. 672-691.
- The Design, Testing, and Implementation of Virginia's NOx Allowance Auction (2009). David Porter, Stephen Rassenti, William Shobe, Vernon Smith, and Abel Winn. *Journal of Economic Behavior & Organization*, Vol. 69, No. 2, pp. 190 – 200.
- Going Green? The Inconvenient Truth About U.Va's Carbon Neutrality Initiative (2008). William Shobe. *Virginia Policy Review*, Vol. 2, No. 1.
- The Economic Value of Publicly Supported Education and Research (2008). William Shobe. *Virginia News Letter*, Vol. 84, No. 3.
- Auction Design for Selling CO2 Emission Allowances Under the Regional Greenhouse Gas Initiative*, with Dallas Burtraw, Charlie Holt, Jacob Goeree, and Karen Palmer. Research sponsored by the New York State Energy Research and Development Agency, Oct. 2007.

Local Options on Global Stocks: How the States are affecting the U.S. Debate on Climate Policy, Dallas Burtraw and William Shobe. *Proceedings of the States and Climate Change Conference*, Woodrow Wilson School, Princeton University, 2007.

The Economic Impact Of The University Of Virginia: How A Major Research University Affects The Local And State Economies, John Knapp and William Shobe, Weldon Cooper Center for Public Service, University of Virginia, 2007.

An Experimental Basis for Public Policy Initiatives, Charles A. Holt, William Shobe and Angela K. Smith, in *Promoting the General Welfare: American Democracy and the Political Economy of Government Performance*, Gerber and Patashnik, eds. Brookings: Washington D.C., 2006.

Book Review of *The Political Economy of the Environment* by James K. Boyce. *Environmental and Natural Resource Economics*, Vol. 23, pp. 482-485, 2002.

Trading Programs for Environmental Management: Reflections on the Air and Water Experiences, Leonard Shabman, William Shobe and Kurt Stephenson, *Environmental Practice*, Vol. 4, pp. 153-162, 2002. Reprinted as Reprint Series Number 166 by the Center for Energy and Environmental Policy Research, Massachusetts Institute of Technology.

Forecasting AFDC Recipients for the Virginia State Budget, with Mark A. Prell. *Virginia Economic Journal*, Vol. 2, pp. 67-84, 1997.

Economic Impact Assessment of Virginia Regulations, Virginia Department of Planning and Budget, September 1995.

Pollution Fees and Charges in North Carolina, a report to the Regulatory Committee of the North Carolina Pollution Prevention Advisory Council, May 26, 1994.

The Use of Panel Data in the Analysis of the Behavioral Response to Taxation, with Joel B. Slemrod, in *Simulation Models in Tax and Transfer Policy*, Johann Brunner and Hans-Georg Peterson eds., Campus Verlag, New York 1990.

The Tax Elasticity of Capital Gains Realizations: Evidence from a Panel of Taxpayers, with Joel B. Slemrod. NBER Working Paper #3237, 1990.

Who Realizes Capital Gains?, with Joel B. Slemrod and Laura Kalambokidis. *Tax Notes*, October 23, 1989, pp. 494-495.

Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc. *Environmental Law* Vol. 9, No. 3, pp. 653-705, 1979.

GRANTS, COMMISSIONS, CONTRACTS, FELLOWSHIPS AND HONORS

2023	Public Impact Focused Research Award, University of Virginia
2022	NSF grant (Co-PI with Clarens) for research on regional aspects of integrated assessment modeling. Joint with Tsinghua University, China (\$500,000 over three years)
2022	Report on disproportionate impacts of the Virginia Clean Economy Act for the Virginia Department of Energy (Approx. \$120,000)
2021	Report on pathways for achieving neutrality for Virginia's electricity sector by 2050 for the Virginia Department of Mines, Minerals and Energy (Approx. \$50,000)
2021	2050 Decarbonization Pathways for Virginia; funded by the Clean Air Task Force (Approx. \$50,000)
2018 - 2021	University of Virginia Sustainability Fellow
2017 - Present	Multi-year analysis of Virginia economic development tax preferences. (\$750,000+).
2016 – 2017	India electricity industry simulation model; work supported by the Regulatory Assistance Project (\$120,000)
2016 - 2017	Bankard Grant (\$5,000) for workshop on Virginia policies to reduce greenhouse gas emissions.
2014	Modeling the EU ETS Market Stability Reserve, with Charlie Holt
2012 - 2013	Investigating market design of the California cap and trade program for limiting greenhouse gas emissions, with Charlie Holt (Approx. \$250,000)
2010 – Present	Member, Joint Advisory Board of Economists, Commonwealth of Virginia
2010 – 2013	U.S. Environmental Protection Agency Star Grant for auction design research, with Charlie Holt. (\$200,000)
2010 - 2011	U.Va. Bankard Fund grant, with Chris Otrok, to improve state-level economic forecasting (\$5,000).
2008 – 2009	Member, National Academy of Sciences panel to evaluate the U.S. Department of Labor O*NET job description database

- 2009 Grant from the Virginia Business Higher Education Council to evaluate the economic impact of higher education on Virginia's economy.
- 2007 With Holt, Burtraw, Palmer, and Goeree; grant from New York State Energy Research & Development Authority for "Research to Support the Design of Auctions in the Regional Greenhouse Gas Initiative (\$250,000).
- 2007 Grant to develop design prototype for the Virginia Metadata Store Distributed Data Access Project.
- 2007 Grant from Virginia Secretary of Agriculture to evaluate the economic impact of agriculture and forestry on Virginia's economy.
- 2007 With Charlie Holt; Bankard Fund for Political Economy grant: "Auctions for the Allocation of Greenhouse Gas Emissions Allowances".
- 2007 Grant from the Virginia Department of Veteran Services to study siting of certain veteran services.
- 2006 Reviewer, US EPA. Star Grants program.
- 2005 With John Knapp; Economic impact study of the University of Virginia.
- 2004 - 2010 Member, Unemployment Insurance Trust Fund Advisory Committee, Virginia Unemployment Commission.
- 1999 - 2005 Chair, Virginia Public Safety Technical Forecasting Committee.
- 2001 Public Sector Freedom of Information Award, Virginia Council for Open Government. For developing the Virginia Regulatory Town Hall web site.
- 2000 Fulbright Fellowship in Environmental Economics, Prague, Czech Republic.
- 1997 - 2003 Adjunct Assistant Professor, Department of Agricultural & Applied Economics, Virginia Tech, Blacksburg, Virginia
- 1994 *Summer Excellence Research Award*, Univ. of North Carolina at Greensboro. For research on the implementation of rights-based entry limitations in North Carolina's coastal fisheries.
- 1985 - 1986 *Conservation Fellowship*, National Wildlife Federation, Washington, DC.
- 1982 - 1990 Licensed Attorney, State of Minnesota

1978 - 1979 *Law Review*, Lewis & Clark Law School

1978 *Oral Advocacy Award*, Moot Court Competition, Lewis & Clark Law School

SERVICE

Current Treasurer, WriterHouse

2006 - 2023 Joint Advisory Board of Economists, Virginia

2015 - 2021 U.Va. Global Sustainability Major Advisory Committee

2018 - 2019 U.Va. Committee on Sustainability, Co-chair Teaching and Research Subcommittee

2015 - 2017 Executive Committee, Batten School

2011 – 2014 UVA Committee on Computing

2008 - 2015 Member, State Advisory Board on Air Pollution, Virginia

2011- 2012 Dean's Council, Batten School of Leadership & Public Policy, UVA

1996 - 1999 Secretary and Executive Board Member, Sabot School, Richmond, Virginia

1994 North Carolina Pollution Prevention Advisory Council, Capacity Committee

1993 - 1994 Sierra Club, National Economics Advisory Committee

RELEVANT SKILLS

Computer languages: PHP, Ruby, Python, SQL, Fortran, Julia
Statistical programs: STATA, Matlab, R
Other: Microsoft Office, Scrivener, HTML, Regular Expressions, Rails, Django