

STEPHEN C. NEWBOLD

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Assistant professor in the Department of Economics at the University of Wyoming. Research and teaching interests include environmental and natural resource economics, bio-economic modeling, applied econometrics, and quantitative policy analysis. Previously an economist in the U.S. Environmental Protection Agency's National Center for Environmental Economics, where duties included benefit-cost analysis and human health and ecological risk assessments of environmental regulations.

EDUCATION:

- 2002 PhD, Ecology, emphasis in Environmental Policy Analysis, University of California, Davis CA
- 2002 MS, Agricultural and Resource Economics, University of California, Davis CA
- 1995 BS, Environmental Engineering, University of Florida, Gainesville FL

WORK EXPERIENCE:

- 2018- Assistant professor, Department of Economics, University of Wyoming
- 2015-2018 Adjunct professor, Department of Economics, Georgetown University
- 2002-2018 Economist, National Center for Environmental Economics,
U.S. Environmental Protection Agency

RESEARCH INTERESTS:

- Analytical and numerical simulation modeling of bio-economic and ecological systems, including commercial and recreational fisheries and other combined human and natural systems
- Non-market valuation, including econometric and other statistical and machine learning methods applied to recreation demand models, stated preference surveys, meta-analysis, and benefit transfer
- Climate change policy evaluation, especially the development and use of economic integrated assessment models to estimate the social cost of carbon
- Systematic conservation planning using mathematical programming techniques applied to terrestrial and marine reserve site selection problems
- Benefit-cost analysis theory and applications to environmental issues including air pollution, water pollution, and climate change
- Value of information theory and methods to inform research priorities in areas of environmental science and policy evaluation

TEACHING:

- ECON 4410 — Natural resource economics
- ECON 5410 — Advanced environmental economics
- ECON 5370 — Advanced econometrics III
- ECON 5310 — Economic research methods

PUBLICATIONS:

Ashworth M, Cherry TL, Finnoff D, **Newbold SC**, Shogren JF, Thunström L. 2022. COVID-19 research and policy analysis: contributions from environmental economists. *Review of Environmental Economics and Policy* 16(1).

Ashworth M, Thunström L, Cherry TL, **Newbold SC**, Finnoff DC. 2021. Emphasize personal health benefits to boost COVID-19 vaccination rates. *Proceedings of the National Academy of Sciences* 118(32).

Thunström L, Ashworth M, Finnoff D, **Newbold SC**. 2021. Hesitancy toward a COVID-19 vaccine. *EcoHealth* 18:44-60.

Downing JA, Polasky S, Olmstead SM, **Newbold SC**. 2021. Protecting local water quality has global benefits. *Nature Communications* 12:2709.

Thunström L, Ashworth M, Shogren JF, **Newbold SC**, Finnoff D. 2020. Testing for COVID-19: willful ignorance or selfless behavior? *Behavioral Public Policy*. doi:10.1017/bpp.2020.15

Newbold SC, Johnston RJ. 2020. Valuing non-market valuation studies using meta-analysis: a demonstration using estimates of willingness-to-pay for water quality improvements. *Journal of Environmental Economics and Management*. 104:102379.

Newbold SC, Finnoff D, Thunström L, Ashworth M, Shogren JF. 2020. Effects of physical distancing to control COVID-19 on public health, the economy, and the environment. *Environmental and Resource Economics*. 76:705-729.

Thunström L, **Newbold SC**, Finnoff D, Ashworth M, Shogren JF. 2020. The benefits and costs of using social distancing to flatten the curve for COVID-19. *Journal of Benefit-Cost Analysis*. doi:10.1017/bca.2020.12

Simon NB, Dockins C, Maguire KB, **Newbold SC**, Krupnick AJ, Taylor LO. 2019. What's in a Name? A Search for Alternatives to "VSL." *Review of Environmental Economics and Policy*. 13(1):155-161.

Newbold SC, Walsh PJ, Massey DM, Hewitt J. 2018. Using structural restrictions to achieve theoretical consistency in benefit transfers. *Environmental and Resource Economics*

69:529-553.

Newbold SC, Simpson RD, Massey DM, Heberling MT, Wheeler W, Corona J, Hewitt J. 2018. Benefit transfer challenges: a U.S. Environmental Protection Agency perspective. *Environmental and Resource Economics* 69:467-481.

Newbold SC, Siikamäki J. 2015. Conservation prioritization using reserve site selection methods. In Halvorsen R, Layton DF, eds. *Handbook on the Economics of Natural Resources*. Northampton, MA: Edward Elgar.

Marten AL, Kopits EA, Griffiths CW, **Newbold SC**, Wolverton A. 2015. Corrigendum to: Incremental CH₄ and N₂O mitigation benefits consistent with the U.S. Governments SC-CO₂ estimates. *Climate Policy* 15(5):678-679.

Newbold SC, Marten AL. 2014. The value of information for integrated assessment models of climate change. *Journal of Environmental Economics and Management* 68:111-123.

Brooks WR, **Newbold SC**. 2014. An updated biodiversity nonuse value function for use in climate change integrated assessment models. *Ecological Economics* 105:342-349.

Marten AL, Kopits EA, Griffiths CW, **Newbold SC**, Wolverton A. 2014. Incremental CH₄ and N₂O mitigation benefits consistent with the US governments SC-CO₂ estimates. *Climate Policy* 15(2):272-298.

Newbold SC, Griffiths C, Moore C, Wolverton A, Kopits E. 2014. Further comment on “A rapid assessment model for understanding the social cost of carbon.” *Climate Change Economics* 5(2):1450005.

Marten AL, **Newbold SC**. 2013. Temporal resolution and DICE. *Nature Climate Change* 3:526-527.

Newbold SC, Griffiths C, Moore C, Wolverton A, Kopits E. 2013. A rapid assessment model for understanding the social cost of carbon. *Climate Change Economics* 4(1):1-40.

Marten AL, Kopp RE, Shouse KC, Griffiths CW, Hodson EL, Kopits E, Mignone BK, Moore C, **Newbold S**, Waldhoff S, Wolverton A. 2012. Improving the assessment and valuation of climate change impacts for policy and regulatory analysis. *Climatic Change*. DOI 10.1007/s10584-012-0608-0.

Griffiths C, Kopits E, Marten A, Moore C, **Newbold S**, Wolverton A. 2012. The social cost of carbon: valuing carbon reductions in policy analysis. In *Fiscal Policy to Mitigate Climate Change: A Guide for Policymakers*, I.W.H. Parry, R. de Mooij, and M. Keen, eds. International Monetary Fund.

Marten AL, **Newbold SC**. 2012. Estimating the social cost of non-CO₂ GHG emissions:

methane and nitrous oxide. *Energy Policy* 51:957-972.

Newbold SC. 2012. Examining the health-risk tradeoffs of mandatory bicycle helmet laws. *Risk Analysis* 32(5):791-798.

Siikamäki J, **Newbold SC**. 2012. Potential biodiversity benefits from international programs to reduce carbon emissions from deforestation. *Ambio: A Journal of the Human Environment* 41(1) Supplement 1:78-89.

Griffiths C, Klemick H, Massey M, Moore C, **Newbold S**, Simpson D, Walsh P, Wheeler W. 2012. U.S. Environmental Protection Agency valuation of surface water quality improvements. *Review of Environmental Economics and Policy* 6(1):130-146.

Newbold SC, Massey DM. 2010. Recreation demand estimation and valuation in spatially connected systems. *Resource and Energy Economics* 32:222-240.

Newbold SC, Daigneault A. 2009. Climate response uncertainty and the benefits of climate change policies. *Environmental and Resource Economics* 44:351-377.

Newbold SC, Siikamäki J. 2009. Prioritizing conservation activities using reserve site selection and population viability analysis. *Ecological Applications* 19(7):1774-1790.

Pongsiri MJ, Roman J, Ezenwa VO, Goldberg TL, Koren HS, **Newbold SC**, Ostfeld RS, Pattanayak SK, Salkeld DJ. 2009. Biodiversity loss affects global disease ecology. *BioScience* 59(11):945-954.

Iovanna R, **Newbold SC**. 2007. Ecological sustainability in policy assessments: a wide-angle view and a close watch. *Ecological Economics* 63:639-648.

Newbold SC, Iovanna R. 2007. Impacts of cooling water withdrawals on harvested fish stocks. *Environmental Science & Technology* 41:2108-2114.

Newbold SC, Iovanna R. 2007. Effects of density-independent mortality on populations and ecosystems: application to cooling water withdrawals. *Ecological Applications* 17(2):390-406.

Massey M, **Newbold SC**, Gentner B. 2006. Valuing water quality changes using a bio-economic model of a coastal recreational fishery. *Journal of Environmental Economics and Management* 52:482-500.

Blackman A, Shih J-S, Evans D, Batz M, **Newbold SC**, Cook J. 2006. The benefits and costs of informal sector pollution control: Mexican Brick kilns. *Environment and Development Economics* 11:603-627.

Blackman A, **Newbold S**, Shih J-S, Evans DA, Cook, J, Batz M. 2006. The benefits and costs of controlling small-firm pollution: informal brickmaking in Ciudad Juarez, Mexico.

In *Small Firms and the Environment in Developing Countries: Collective Impacts Collective Action*, edited by Allen Blackman. Resources for the Future: Washington, DC.

Newbold SC. 2005. A combined hydrologic simulation and landscape design model to prioritize sites for wetlands restoration. *Environmental Modeling and Assessment* 10:251-263.

Newbold SC, Eadie JM. 2004. Using species-habitat models to target conservation: a case study with breeding mallards. *Ecological Applications* 14(5):1384-1393.

Newbold SC. 2002. Integrated modeling for watershed management: multiple objectives and spatial effects. *Journal of the American Water Resources Association* 38(2):341-353.

WORKING PAPERS:

Newbold SC, Finnoff D, Ashworth MA, Thunström L, Shogren JF. Random testing with self-quarantine dominates physical distancing for the control of COVID-19.

Newbold SC, Massey DM, Whitehead J. Combining aggregate and individual-level data to estimate a repeated choice recreation demand model. To be revised and re-submitted to *Land Economics*.

Marten AM, **Newbold SC**. Economy-wide effects of mortality risk reductions from environmental policies. To be revised and re-submitted to the *Journal of the Association of Environmental and Resource Economists*.

Massey DM, Moore C, **Newbold SC**, Ihde T, Hownsend H. 2017. Commercial fishing and outdoor recreation benefits of water quality improvements in the Chesapeake Bay. NCEE Working Paper #17-02. <https://www.epa.gov/sites/production/files/2017-08/documents/2017-02.pdf>

Marten AL, **Newbold SC**. 2017. Economy-wide effects of mortality risk reductions from environmental policies. NCEE Working Paper #17-03. <https://www.epa.gov/sites/production/files/2017-07/documents/2017-03.pdf>

Newbold SC. 2011. Valuing health risk changes using a life-cycle consumption framework. National Center for Environmental Economics Working Paper #11-03.

Griffiths C, Kopits E, Marten A, Moore C, **Newbold S**, Wolverton A. 2010. Estimating the social cost of carbon for regulatory impact analysis. Resources for the Future Weekly Policy Commentary.

Newbold SC, Griffiths C, Moore CC, Wolverton A, Kopits E. 2010. The “social cost of carbon” made simple. NCEE Working Paper #10-07.

Newbold SC, Daigneault A. 2010. Uncertainty and the benefits of climate change policies. In *Assessing the Benefits of Avoided Climate Change: Cost-Benefit Analysis and Beyond*. Gullett J, Richardson LJ, Adkins L, Seidel S, eds. Proceedings of Workshop on Assessing the Benefits of Avoided Climate Change, March 16-17, 2009. Pew Center on Global Climate Change: Arlington, VA. p. 183-197.

U.S. Environmental Protection Agency. 2006. Ecological Benefits Assessment Strategic Plan. EPA-240-R-06-001. Office of the Administrator, Washington, DC.

Newbold SC, Siikamäki J, Clark M. 2005. Cost effective habitat protection: the case of Pacific salmon. Draft working paper, prepared for the Association of Environmental and Resource Economists summer workshop.

Lovell S, **Newbold S**, Owens N, Wyatt TJ. 2004. How academic economists can improve benefit transfers at EPA. Association of Environmental and Resource Economists (AERE) Newsletter 24(2):25-28.

Newbold SC. 2002. Targeting conservation activities: cost-effective wetlands restoration in the Central Valley of California. PhD dissertation.

Blackman A, **Newbold SC**, Shih J-S, Cook J. 2000. The benefits and costs of informal sector pollution control: Mexican brick kilns. Resources for the Future Discussion Paper. <http://www.rff.org/Documents/RFF-DP-00-46.pdf>

PRESENTATIONS:

2021 December 17, “Valuing satellite data for harmful algal bloom early warning systems,” Grants for Assessing the Benefits of Satellites (GABS) Community of Practice Meeting.

2021 November 20, “A funnel plot density estimator of publication bias for meta-analysis,” Southern Economics Association 91st Annual Meeting.

2020 November 22, “A two-stage random-effects meta-analysis of value per statistical life estimates,” Southern Economics Association 90th Annual Meeting.

2020 October 16, “Random testing with self-quarantine dominates physical distancing for the control of COVID-19,” Appalachian State University, Department of Economics seminar series.

2020 September 11, “The benefits and costs of testing with self-quarantine versus physical distancing for the control of COVID-19,” George Mason Online Pandemic Modeling Forum.

2020 July 30, “Harnessing the value of real-time ecological data to improve migratory species conservation efficiency,” North American Congress for Conservation Biology (NAACB) Vir-

tual Conference, Crossing Boundaries—Innovative Approaches to Conservation.

2020 May 12, “The economics of the pandemic and social distancing,” with Madison Ashworth, David Finnoff, Jason F. Shogren, and Linda Thunstrom. University of Wyoming College of Business, 3rd Virtual COVID Business Informational Session.

2020 April 17, “The benefits and costs of using social distancing to flatten the curve for COVID-19,” University of New Mexico, Department of Economics, Online graduate seminar series.

2020 April 7, “Estimating the benefits and costs of social distancing guidelines for COVID-19,” Integrated Economic Analysis Needed to Advance Short Term Decision-Making in the Novel Coronavirus Pandemic, Yale School of Medicine.

2019 November 24, “Meta-BCA: optimizing the level of effort for benefit-cost analysis,” 88th Annual Conference of the Southern Economic Association, Washington, DC.

2019 October 21, “Non-market valuation for migratory species: challenges and opportunities,” Economics/Policy of Seasonal Migratory Species Conservation Workshop, Laramie, Wyo.

2019 September 12, “Ecological benefit spillovers from nutrient load reductions and management improvements in a multi-species coastal fishery,” BIOECON Conference XXI, Wageningen, Netherlands.

2019 August 12, “Reflections on WOTUS (Waters of the United States): When is no number (\$B) better than some number?,” Camp Resources XXVI, Asheville, NC.

2019 July 23, “Economic analysis at U.S. federal agencies,” Human Dimensions Research in Delta Environments, Davis, CA.

2019 May 30, “What is a non-market valuation study worth? A demonstration using a meta-analysis of water quality values,” Association of Environmental and Resource Economists, Summer Conference, Lake Tahoe, NV.

2019 May 20, “Ecological inference for non-market valuation: using aggregate site visitation data to estimate an individual-level recreation demand model,” Challenges of Natural Resource Economics and Policy, 6th National Forum on Socioeconomic Research in Coastal Systems, New Orleans, LA.

2019 April 5, “A similarity estimator for benefit transfers,” Integrated Assessment Models and the Social Costs of Water Pollution, Atkinson Center, Cornell University.

2018 November 8, “Meta-analysis, structural benefit transfer, and the value of information from new stated preference studies,” Colorado State University, Agricultural & Resource

Economics seminar.

2018 June 27, “The EPA’s water quality index: actual, ideal, and places in between,” United States Environmental Protection Agency, National Center for Environmental Economics brownbag seminar.

2017 April 20, “On the use of benefit-cost analysis for evaluating environmental policies.” Guest class presentation, Harvard University, Cambridge, MA.

2017 March 23, “Three case studies on the use of meta-analysis for evaluating environmental policies,” University of Delaware, School of Marine Science and Policy seminar series.

2016 November 18, “Estimating benefit transfer functions that add up.” Southern Economics Association annual meetings, Washington, DC.

2015 September 29, “Valuing water quality improvements in the Chesapeake Bay: commercial fishing benefits.” School of Marine Science and Policy, University of Delaware.

2015 April 16, “Valuing water quality improvements in the Chesapeake Bay: commercial fishing benefits.” Energy and Environment Forum, Howard H. Baker Jr Center for Public Policy, University of Tennessee.

2013 March 26, “Estimating a recreation demand model using aggregate data on visitation rates to outdoor recreation sites.” CNREP (Center for Natural Resource Economics & Policy) 4th National Forum on Socioeconomic Research in Coastal Systems, New Orleans, LA.

2011 March 5, “Valuing health risk changes using a life-cycle consumption framework.” Valuing Lives: A Conference on Ethics in Health and the Environment, Institute for Policy Integrity, New York University School of Law, New York, NY.

2009 August 3, “Systematic conservation planning and the value of information.” Ecological Society of America Annual Meetings, Albuquerque, NM.

2009 March 16, “Climate change policy benefits and uncertainty,” Pew Center on Climate Change.

2008 October 3, Discussant at AEI Reg-Markets Center, “Climate change and discounting: a guide for the perplexed,” by David Weisbach and Cass Sunstein, Washington, DC.

2008 September 27, “Recreation demand estimation and valuation in spatially connected systems,” with Matt Massey. Workshop on Spatial Environmental and Resource Economics, Centennial, WY.

2007 November, Discussant at AEI-Brookings Joint Center conference, “Rethinking Climate Change: Do We Need a New Paradigm?” Washington, DC.

2007 May, “The value of information for environmental policy,” RFF seminar series.

2006 March, “Valuing management options and environmental changes in a recreational fishery,” with Matt Massey. NCEE brownbag seminar series.

2005 November, “Socio-economic Causes and Consequences of Future Environmental Changes Workshop,” sponsored by the U.S. EPA’s National Center for Environmental Economics and National Center for Environmental Research. Discussant in Session 1 on “Trends in housing, land use, and land cover change.”

2005 July, “Cost effective habitat protection: the case of Pacific salmon,” with Juha Siikamäki and Matt Clark. Association of Environmental and Resource Economists summer workshop, Jackson Hole, WY.

2005 April, “Valuing water quality changes using a bio-economic model of a coastal recreational fishery,” with Matt Massey and Brad Gentner. NOAA fisheries economics seminar series.

2005 February, “Population level impacts on fish of cooling water intake withdrawals,” with Rich Iovanna. Clean Water Act Section 316(b) expert review panel.

2004 August, “A numerical Kuhn-Tucker recreation demand model with trip frequencies and durations,” with Matt Massey. Oral presentation. Camp Resources XII, Wilmington, NC.

2004 August, “An ideal free regression model of species distributions.” Annual meetings of the Ecological Society of America, Portland, OR.

2004 August, “Designing policy relevant research: a case study on water quality and recreational fishing.” Annual meetings of the American Agricultural Economics Association, Denver, CO.

2004 March, “Spatial models in economics and ecology, and applied ecological modeling for environmental regulatory analyses,” guest lecture for EST101, Human-environment interactions, George Mason University, Prof Dawn Parker.

2003 July, “Wetlands, wildlife, and water quality: targeting and tradeoffs,” with Marca Weinberg. Annual meetings of the American Agricultural Economics Association.

2001 January, “Integrated Modeling for Watershed Management Multiple Objectives and Spatial Effects.” Symposium on Integrated Decision-making for Watershed Management, Washington, DC.

2000 August, “The Benefits and Costs of Informal Sector Pollution Control: Mexican Brick Kilns,” with Blackman A, Shih J-S, Cook J. Annual meetings of the American Agricultural

Economics Association, Tampa, FL.

1998 October, "An Integrated Modeling Framework for Analyzing Wetlands Management: Balancing Ecosystem Services and Economic Factors." 4th Occasional California Workshop on Environmental and Natural Resource Economics, Santa Barbara, CA.

CONTRACTS AND GRANTS:

2020-2021, Grants for Assessing the Benefits of Satellites (GABS), VALUABLES, an RFF/NASA Consortium, “Valuing satellite data for harmful algal bloom early warning systems,” with Shannon Albeke, Sarah Lindley, and Joshua Viers.

1999-2002, NSF/EPA Decision Making and Valuation for Environmental Policy Grant, “An Integrated Modeling Framework for Analyzing Wetlands Policies: Balancing Ecosystem Services and Economic Factors,” with Marca Weinberg and Jim Wilen.

1999-2001, University of California, Centers for Water and Wildland Resources, “An Integrated Modeling Framework for Analyzing Wetlands Policies: Balancing Ecosystem Services and Economic Factors,” with Marca Weinberg.

PROFESSIONAL SERVICE:

University of Wyoming, Department of Economics, Graduate student admissions review committee.

2019-2020, National Socio-Environmental Synthesis Center (SESYNC) Scientific Review Committee.

Reviewer for: *American Journal of Agricultural Economics*, *Biological Conservation*, *Climate Change Economics*, *Conservation Biology*, *Ecological Applications*, *Ecological Economics*, *Economic Inquiry*, *Environmental and Ecological Statistics*, *Environmental and Resource Economics*, *Environmental Science and Policy*, *Environmental Science & Technology*, *Journal of the Association of Environmental and Resource Economists*, *Journal of the Association of Environmental and Resource Economists*, *Journal of Benefit-Cost Analysis*, *Journal of Environmental Economics and Management*, *Journal of Environmental Economics and Policy*, *Journal of Public Economics*, *Marine Resource Economics*, *Land Economics*, *Nature Sustainability*, *PLOS Biology*, *Proceedings of the National Academy of Sciences*, *Resource and Energy Economics*, *Review of Environmental Economics and Policy*, *Review of Environmental Science and Policy*, *Water Resources Research*.

HONORS AND AWARDS:

2019-2020 Crocker-Powell Award for Outstanding Research by a junior faculty member. Awarded for “Ecological inference for non-market valuation: using aggregate data to estimate a repeated site choice recreation demand model,” co-authored with David Massey and John Whitehead.

2018 EPA Scientific and Technological Achievement Award Level III: “Developing and refining methods to estimate the economic costs and benefits of greenhouse gas mitigation policies”

2018 EPA Scientific and Technological Achievement Award Level III: “Filling an analytic gap in benefit-cost analysis of methane and nitrous oxide emission reductions”

2017 United States Environmental Protection Agency Gold Medal for Exceptional Service: “For identifying a critical gap and conducting diligent research leading to scientifically defensible, peer reviewed estimates of the social cost of methane to inform priority regulations.”

2017 EPA Office of Water Achievement in Science & Technology Award: “Uncompromising dedication to first principles and enormous creativity in problem solving, resulting in better methods for monetizing the benefits of improved surface water quality”

2016 United States Environmental Protection Agency Bronze Medal for Commendable Service: “For successfully developing estimates and methods to quantify the economic benefits of water quality improvements to the Chesapeake Bay”

2016 EPA Administrator’s Office award: “Successfully conceptualized and developed improvements in estimates and methods to quantify the economic benefits of water quality improvements to the Chesapeake Bay from EPA regulations”

2015 EPA Scientific and Technological Achievement Award Level III: “Demonstrating the limitations of using global-warming potentials to estimate the social cost of methane and nitrous oxide”

2015 EPA Scientific and Technological Achievement Award Honorable Mention: “An exploration of health-risk tradeoffs and their relevance to conducting benefit-cost analysis with an application to bicycle-helmet laws”

2013 EPA Gold Medal for Exceptional Service: “These EPA economists worked tirelessly to develop methods, models and analyses to lay the analytic foundation for moving forward on reducing global climate change emissions”

2013 EPA Scientific and Technological Achievement Award Honorable Mention: “Advancing recreational demand modeling by accounting for species population dynamics and habitat selection”

2013 EPA Bronze Medal for Commendable Service: “In recognition of successfully developing updated estimates of the economic benefits of reducing carbon dioxide emissions for use in federal regulatory impact analyses”

2007 EPA Bronze Medal for Commendable Service: “For your work in developing the Ecological Benefits Assessment Strategic Plan (EBASP) which serves as a roadmap of strategic EPA actions to identify, quantify, and value the ecological benefits of environmental protection policies”

2006, EPA Bronze Medal for Commendable Service: “For your fish population model which provides the best available picture of ecological impacts of cooling water withdrawals and will contribute to more informed decision-making for future agency regulations”

2005 EPA Bronze Medal for Commendable Service: “For improving quality and coverage of Office of Water economic analyses”

2004 Bronze Medal: “For outstanding contributions as a team member collaborating to revitalize Office of Solid Waste and Emergency Response economic analyses”