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Education

Ph.D., Resource Economics and Policy, Duke University, Durham, North Carolina, 1992
M.S., Resource Economics and Policy, Duke University, Durham, North Carolina, 1987
B.S., Economics and Finance (cum laude), University of Delaware, Newark, Delaware, 1983

Summary of Professional Experience

Dr. Murray is Director for Economic Analysis at the Nicholas Institute for Environmental Policy Solutions, Research Professor at the Nicholas School of the Environment at Duke University and Fulbright Visiting Research Chair in Environment and Economy at University of Ottawa's Institute of the Environment. He is widely recognized for his work on the economics of climate change policy, including the design of cap-and-trade policy elements to address cost containment and inclusion of offsets from traditionally uncapped sectors such as forestry, agriculture, and coastal ecosystems. Members of the United States Congress, state legislators and regulators have sought the counsel of Dr. Murray and Nicholas Institute colleagues in developing climate change legislative proposals and regulatory options. Their development of the cost containment reserve mechanism is now in use in several greenhouse cap-and-trade programs in North America. Dr. Murray has been invited as a co-author of several national and international assessments of natural resources, especially related to climate change. Of particular note, he serves on a National Academy of Sciences panel on greenhouse gases and the tax code, where he led the panel's efforts on biofuel subsidies. He was a convening lead author of the Intergovernmental Panel on Climate Change's Special Report on Land Use, Land Use Change, and Forestry. He has convened several forums of economic modeling experts to examine and communicate the results of their climate, energy and land use policy efforts to the public and private sectors. His research has examined the economic effects of traditional command-based regulatory strategies for pollution control and more market-oriented approaches such as cap-and-trade programs and emission taxes. He has been a consultant to a wide range of clientele in the public and private sector, including numerous federal government agencies, members of Congress and their staff, state regulatory agencies, CEOs and senior staff from Fortune 500 companies, trade groups, nongovernmental organizations, and other academic institutions. His work has been published in books, edited volumes, and professional journals, including *Science*, *Nature Climate Change*, *The American Economic Review*, *The Review of Economics and Statistics*, *American Journal of Agricultural Economics*, *Journal of Environmental Economics and Management*, *Land Economics*, *Review of Environmental Economics and Policy*, *Environmental and Resource Economics*, *Ecological Economics*, *PLOS One*, *Ecological Applications*, *Climatic Change*, *Mitigation and Adaptation*

Strategies for Global Change, Energy Journal, Energy Policy, and Forest Science. Prior to coming to the Nicholas Institute in 2006, Dr. Murray was Director of the Center for Regulatory Economics and Policy Research at RTI International, a university-affiliated not-for-profit research institution.

Professional Experience

2006 to date	Duke University, Nicholas Institute for Environmental Policy Solutions, Durham, NC <u>Director for Economic Analysis</u>
2015	University of Ottawa, Institute of the Environment, Ottawa, ONT <u>Fulbright Visiting Research Chair in Environment and Economy</u>
2007 to date	Duke University, Nicholas School of the Environment, Durham, NC <u>Research Professor</u> (Full rank)
1992 to 2006	RTI International, Center for Regulatory Economics and Policy Research, Research Triangle Park, NC <u>Senior Economist and Director</u> (after 2004)
1999 to 2006	North Carolina State University, College of Forest Resources, Raleigh, NC <u>Adjunct Assistant Professor</u>
1994 to 2002	Duke University, Nicholas School of the Environment, Durham, NC <u>Adjunct Associate Professor</u>
1986 to 1992	U.S. Department of Agriculture, Forest Service <u>Research Economist</u>
1983 to 1985	Arthur Andersen and Company <u>Management Information Systems Consultant</u>

Program Development

Dr. Murray, Director for Economic Analysis, came to the Nicholas Institute in March of 2006, shortly after its launch. He oversees the Institute's economics portfolio and staff of economists and works with the Institute director, other senior directors, faculty, and staff to identify opportunities for the application of sound economic principles and advanced analysis to develop solutions to our most important environmental policy problems. He has initiated a number of key

initiatives at the Institute that have directly influenced the development of policies at federal, state and international levels, especially in the areas of climate change policy. He is responsible for ensuring the quality of the Institute's economics work, its applicability to the problems being addressed and, and communicating to policy makers in the public, private and NGO sectors and to the media.

In addition to overseeing the Institute's environmental economics program, Dr. Murray is co-lead of the Duke Environmental Economics Working Group, which convenes approximately 20 economics faculty and senior researchers working on environmental economics across six schools and institutes across campus. Through this working group, he has launched and directs the Duke Environmental Economics Doctoral Scholars (DEEDS) programs, which provides Institute funding each year for doctoral students wishing to pursue independent research in environmental economics on topics of current policy importance. He is a member of the Duke Environmental Leadership (DEL) distance-learning program faculty, teaching the program's economics core course and working with other faculty and DEL staff to admit and educate exceptional mid-career environmental professionals. He is the co-founder of the Conservation Economics Initiative, a partnership between Duke and the Conservation Strategies Fund which develops online access training for conservation professionals throughout the world.

Prior to joining the Nicholas Institute, Dr. Murray was Director of RTI's Center for Regulatory Economics and Policy Research (REPR), a group of 35 research professionals whose mission is to improve the human condition through public policy informed by rigorous analysis integrating economics and related disciplines. The Center's work spanned the policy domains of the environment, natural resources, agriculture, public health, food safety, energy, and technology. The Center's sponsors included US EPA, USDA, DOE, FDA, Centers for Disease Control and Prevention (CDC), DHS, National Park Service, The World Bank, Conservation International, and the United Nations.

Honors and Awards (selected)

Fulbright chair in Environmental Economics and Policy, University of Ottawa, 2015
National Academy of Sciences committee on greenhouse gases and the tax code, 2011-12
Intergovernmental Panel on Climate Change, joint recipient of the 2007 Nobel Peace Prize¹
Distinguished Publication Award, 2004, RTI International
Frequently Published Author Award, 2004, RTI International
Career Author Award, 2003, RTI International
American Agricultural Economics Association Outstanding Dissertation Award nominee, 1993
Dorothy Hoener Scholarship, Oregon State University, 1988
Graduate Student of the Year, Duke University School of Forestry & Environmental Studies, 1987
Omicron Delta Epsilon, National Economics Honor Society, 1983

Professional Associations

Fulbright Scholars Program
Editorial Board, *Greenhouse Gas Measurement and Management*
Board of Directors, Triangle Census Research Data Center, 2001-2007

¹ The IPCC was awarded the 2007 Nobel Peace prize, for which it acknowledges credit jointly among all current and former authors of IPCC reports, including Dr. Murray. The IPCC as an organization is the awardee; however, not the individuals.

Intergovernmental Panel on Climate Change, 1999-2000 (invited)
National Climate Assessment Team, 1999-2001 (invited)
American Economics Association
Association of Environmental and Resource Economists

Teaching

Core teaching faculty, Duke Environmental Leadership Program

Courses taught

- Economics of Environmental Management (2011-)
- Coastal Conservation Economics (online offering, 2015)
- Environmental Management in a Changing World: Coping with Sea Level Rise (Duke program in Venice) (2014-)
- Bass Connections
 - o Feasibility Study for a Campus Digester – (2015-16, accepted)
 - o Options for Regulating Greenhouse Gases from Oil Refineries - (2013-14)
- Ecosystem Service Markets in Practice (2008)
- Collaborative Research on REDD (2010, joint with NC State and UNC-Chapel Hill)
- Case Studies in Resource Management (1993-94)

Other University Service (selected)

Co-chair, Duke Environmental and Energy Economics Working Group (2006-)

Director, Duke Environmental Economics Doctoral Scholars Program (2013-)

Faculty working group, Environmental Management and Policy Program, Duke-Kunshan U (2014-)

Working group on energy-environment online education (2014-)

Duke University Energy Initiative, Faculty Advisory Council (2012-)

Core faculty, University Program in Environmental Policy (2011-)

Search committees

- Dean, Nicholas School of the Environment (2013-14)
- Director, Oceans and Coastal Policy, Nicholas Institute (2014)
- Faculty in Energy Policy (2013-14), Sanford School and Duke U Energy Initiative
- Faculty in Energy and Environmental Policy (2010-11), Sanford/Nicholas Institute
- Director, Strategy and Planning, Nicholas Institute (2012)

Duke Forest Advisory Committee (2011-14)

Faculty advisor, Duke Environmental Markets Student Group (2010-13)

Faculty advisor, Duke student delegation, UN Framework Convention on Climate Change (2009-2012)

(Inaugural) Winter Forum co-organizer (2009-10)

Publications

Google Scholar H-index: 33; I-10 index: 50

Articles in peer-reviewed journals (55)

- McCarl, B.A. and B.C. Murray “Theme Overview: Revisiting the Evidence and Potential Solutions on Climate Change.” *Choices* (forthcoming).
- Murray, B.C. 2015. “Why Have Carbon Markets Not Delivered Agricultural Emission Reductions in the United States?” *Choices* (forthcoming).
- Murray, B., W. Pizer and M. Ross. 2015. “Regulating Existing Power Plants under the U.S. Clean Air Act: Present and Future Consequences of Key Design Choices.” *Energy Policy* 83: 87-98.
- Pizer, W., M.J. Adler, J. Aldy, D. Anthoff, M. Cropper, K. Gillingham, M. Greenstone, B. Murray, R. Newell, W. Pizer, R. Richels, A. Rowell, S. Waldhoff, and J. Wiener. 2014. “Using and improving the social cost of carbon.” *Science* . Vol. 346 no. 6214 pp. 1189-1190 (5 Dec, 2014)
- Murray, B.C. and J.M. Monast. 2014. “Greenhouse Gas Controls and the States.” *EM Magazine*, June, 2014. Invited feature article (reviewed).
- Galik, C.S., B.C. Murray, S. Mitchell, P. Cottle. 2014. “Alternative Approaches for Addressing Non-permanence in Carbon Projects: An Application to Afforestation and Reforestation under the Clean Development Mechanism.” *Mitigation and Adaptation Strategies for Global Change*. <http://link.springer.com/article/10.1007/s11027-014-9573-4>
- Murray, B.C., M. Cropper, F de la Chesnaye, and J.M. Reilly. 2014. “How Effective are U.S. Renewable Energy Subsidies in Cutting Greenhouse Gases?” *The American Economic Review: Papers and Proceedings 2014* 104(5): 569–574
- Pendleton, L.H., A.E Sutton-Grier, D.R. Gordon, B.C. Murray, B.E. Victor, R.B. Griffis, J.A.V Lechuga, C. Giri. 2013. “Considering “Coastal Carbon” in Existing U.S. Federal Statutes and Policies.” *Coastal Management* 41(5): 439-456.
- Mosnier, A.; P. Havlík; H. Valin; J. Baker; B. Murray; S. Feng; M. Obersteiner; B.A. McCarl; S. K. Rose; U. A. Schneider. 2013. “Alternative U.S. Biofuel Mandates and Global GHG emissions: The Role of Land Use Change, Crop Management and Yield Growth.” *Energy Policy*.
- Baker, J.S., B.C. Murray, B.A. McCarl, S. Feng, R. and R. Johansson. 2012. “Implications of Alternative Agricultural Productivity Growth Assumptions on Land Management, Greenhouse Gas Emissions, and Mitigation Potential.” *American Journal of Agricultural Economics*. doi: 10.1093/ajae/aas114 First published online: December 16, 2012.
- Galik, C.S., B.C. Murray, D.E. Mercer. 2012. “Where is the carbon? Carbon sequestration potential from private forestland in the U.S. South.” *Journal of Forestry*. DOI: <http://dx.doi.org/10.5849/jof.12-055>. Appeared or available online: November 22, 2012

- Murray, B.C. "Mangroves Hidden Value." 2012. *Nature Climate Change* 2, 773–774
doi:10.1038/nclimate1729 Published online 26 October 2012
- Pendleton L, Donato DC, Murray BC, Crooks S, Jenkins WA, et al. 2012. Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. *PLoS ONE* 7(9): e43542. doi:10.1371/journal.pone.0043542
- McKinley, D.C., M. G. Ryan, R.A. Birdsey, C.P. Giardina, M. E. Harmon, L.S. Heath, R.A. Houghton, R.B. Jackson, J.F. Morrison, B.C. Murray, D.E. Pataki, K. E. Skog. 2011. "A synthesis of current knowledge on forests and carbon storage in the United States." *Ecological Applications*: 21(6), 2011, pp. 1902–1924.
- Murray, B.C. and J.S. Baker. 2011. "An Output-based Intensity Approach for Crediting Greenhouse Gas Mitigation in Agriculture: Explanation and Policy Implications." *Greenhouse Gas Measurement and Management*. Vol. 1: 27-36.
- Lopomo, G., L.M. Marx, D. McAdams, B. Murray. 2011. "Carbon Allowance Auction Design." *Review of Environmental Economics and Policy* 5(1): 25-43.
- Murray, B.C.. 2010. "Pricing Carbon and Other Options for Addressing the Economic Challenges of U.S. Climate Legislation." Invited article for *Aspen Institute Congressional Program Series* Vol. 25(2): 21-30.
- Ryan, M.G., M. E. Harmon, R. A. Birdsey, C.P. Giardina, L. S. Heath, R.A. Houghton, R. B. Jackson, D. C. McKinley, J.F. Morrison, B. C. Murray, D.E. Pataki, K. E. Skog. 2010. "A Synthesis of the Science on Forests and Carbon for U.S. Forests." *Issues in Ecology*. Issue 13, Spring 2010, pp. 1-16.
- Baker, J.S., B.A. McCarl, B. C. Murray, S.K. Rose, R. J. Alig, D.Adams, G. Latta, R. Beach, A. Daigneault. 2010. "Net-Farm Income and Land Use under a U.S. Greenhouse Gas Cap-and-Trade." *Policy Issues*, P17 (April).
- Jenkins, W.A., B.C. Murray, R.A. Kramer, and S.P. Faulkner. 2010. "Valuing Ecosystem Services from Wetlands Restoration in the Lower Mississippi Alluvial Valley." *Ecological Economics* 69 (5): 1051–1061.
- Murray, B.C. and L.P. Olander. 2009. "REDD, White, and Blue." Invited article for *Carbon Finance*, vol. 6, issue 9.
- Murray, B.C. 2009. "The Economics of Climate Change Prevention: Benefits, Costs and Policy Options." Invited article for *Aspen Institute Congressional Program Series* Vol. 24(2): 43-50.
- Murray, B.C. 2009. "Economics and the Climate Change Mitigation Portfolio" *Journal of Land, Resources, and Environmental Law* 29(1):39-52
- Murray, B.C., and H. Hosterman. 2009. "Climate Change, Cap-and-Trade and the Outlook for U.S. Policy." *North Carolina Journal of International Law and Commercial Regulation*.34(3):699-720

- Piñeiro, G, E.G. Jobbágy, J. Baker, B.C. Murray, and R.B. Jackson. 2009. "Set-Asides Can Be Better Climate Investment than Corn-Ethanol" *Ecological Applications* 19(2): 277-282
- Murray, B.C, R.G. Newell, and W.A. Pizer. 2009. "Balancing Cost and Emissions Certainty: An Allowance Reserve for Cap-and-Trade." *Review of Environmental Economics and Policy* 3(1): 84-103
- Murray, B.C. "Offsets Improve Flexibility." Invited article ("Another View"), *Environmental Forum*, November/December 2008, P.39
- Olander, L.P., H.K. Gibbs, M. Steininger, J. J. Swenson, and B.C. Murray. 2008. "Reference Scenarios for Deforestation and Forest Degradation in Support of REDD: A Review of Data and Methods." *Environmental Research Letters* 3(2008).
- Depro, B, B. Murray, R. Alig, A. Shanks. 2008. "Public Land, Timber Harvests, and Climate Mitigation: Quantifying Carbon Sequestration Potential on U.S. Public Timberlands." *Forest Ecology and Management* 255:1122-1134.
- Kim, M, B.A. McCarl, and B.C. Murray. 2008. "Permanence Discounting for Land-Based Carbon Sequestration." *Ecological Economics*. 64:763-769.
- Murray, B.C., B.L. Sohngen, and M.T. Ross. 2007. "Economic Consequences of Consideration of Permanence, Leakage and Additionality for Soil Carbon Sequestration Projects." *Climatic Change* 80:127-143.
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- DeAngelo, B.J., F. de la Chesnaye, R.H. Beach, A. Sommer, and B.C. Murray. 2006 "Methane and Nitrous Oxide Mitigation in Agriculture." *The Energy Journal*. Special issue (eds: de la Chesnaye, F and J. Weyant) pp: 89-108.
- Jackson, R.B.. E.G. Jobbágy, R. Avissar, S. Baidya Roy, D. Barrett, C.W. Cook, K.A. Farley, D.C. le Maitre, B.A. McCarl, and B.C. Murray. 2005. "Trading Water for Carbon with Biological Carbon Sequestration." *Science* 310: 1944-1947.
- Beach, R.H., S.K. Pattanayak, R.C. Abt, B.C. Murray, and J.C. Yang. 2005. "Empirical Studies of Non-Industrial Private Forest Management: A Review and Synthesis." *Forest Policy and Economics* 7(3):261-281.
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- Murray, B.C., W.N. Thurman, and A. Keeler. 2005. "Tax Interaction Effects, Environmental Regulation, and 'Rule of Thumb' Adjustments to Social Cost." *Environmental and Resource Economics* 30(1):73-92.
- Murray, B.C. 2004. "Overview of Agricultural and Forestry GHG Offsets on the U.S. Landscape." *Choices* Fall:13-18.

- Pattanayak, S.K., R.C. Abt, A.J. Sommer, F. Cabbage, B.C. Murray, J.C. Yang, D. Wear, and S. Ahn. 2004. "Forest Forecasts: Does Individual Heterogeneity Matter for Market and Landscape Outcomes?" *Forest Policy and Economics* 6:243-260.
- Wear, D.N. and B.C. Murray. 2004. "Federal Timber Restrictions, Interregional Spillovers, and the Impact on U.S. Softwood Markets." *Journal of Environmental Economics and Management* 47(2):307-330.
- Murray, B.C., B.A. McCarl, and H. Lee. 2004. "Estimating Leakage from Forest Carbon Sequestration Programs." *Land Economics* 80(1):109-124.
- Pattanayak, S.K., B.C. Murray, and R.C. Abt. 2002. "How Joint is Joint Forest Production? An Econometric Analysis of Timber Supply Conditional on Endogenous Amenity Values." *Forest Science* 48(3):479-491.
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- Abt, R.C., and B.C. Murray. 2001. "Southeastern U.S. Timber Market Response to Climate Change Impacts on Forestry and Agriculture." *World Resource Review* 13(2):171-186.
- Murray, B.C., R.C. Abt, D.N. Wear, P.J. Parks, and I.W. Hardie. 2001. "Land Allocation in the Southeastern U.S. in Response to Climate Change Impacts on Forestry and Agriculture." *World Resources Review* 13(2):239-251.
- Murray, B.C., and R.C. Abt. 2001. "Estimating Price Compensation Requirements for Eco-certified Forestry." *Ecological Economics* 36(1):149-163.
- Murray, B.C., S.P. Prisley, R.A. Birdsey, and R.N. Sampson. 2000. "Carbon Sinks Provisions in the Kyoto Protocol: Potential Relevance for U.S. Forests." *Journal of Forestry* 98(9): 6-11.
- Murray, B.C. 2000. "Carbon Values, Reforestation, and 'Perverse' Incentives Under the Kyoto Protocol: An Empirical Analysis." *Mitigation and Adaptation Strategies for Global Change* 5(3):271-295.
- McNulty, Steven G., Jennifer A. Moore, Louis Iverson, Anantha Prasad, Robert Abt, Bryan Smith, Ge Sun, Michael Gavazzi, John Bartlett, Brian Murray, Robert Mickler, and John D. Aber. 2000. "Development and Application of Linked Regional Scale Growth, Biogeography, and Economic Models for Southeastern United States Pine Forests." *World Resources Review* 12(2):298-320.
- Anderson, D.A., B.C. Murray, J.L. Teague, and R.C. Lindrooth. 1998. "Exit from the Meatpacking Industry: A Microdata Analysis." *American Journal of Agricultural Economics* 80(1):96-106.
- Murray, B.C., and D.N. Wear. 1998. "Federal Timber Restrictions and Interregional Arbitrage in U.S. Lumber." *Land Economics*. 74(1):76-91.
- Murray, B.C. 1995. "Measuring Oligopsony Power with Shadow Prices: U.S. Markets for Pulpwood and Sawlogs." *The Review of Economics and Statistics* 77(3):486-498.

- Murray, B.C. 1995. "Oligopsony, Vertical Integration, and Output Substitution: Welfare Effects in U.S. Pulpwood Markets." *Land Economics* 71(2):193-206.
- Parks, P.J., and B.C. Murray. 1994. "Land Attributes and Land Use Change: Nonindustrial Forest Use in the Pacific Northwest." *Forest Science* 40(3):558-575.
- Abt, R.C., J. Brunet, B.C. Murray, and D.G. Roberts. 1994. "Productivity Growth and Price Trends in the North American Sawmilling Industry: An Interregional Comparison." *Canadian Journal of Forest Research* 24:139-148.

Edited Volumes, Books and Monographs (peer-reviewed) (31)

- Murray, B., Vincent, J., and G. Van Houtven. 2014. "Different Uses of the Ecosystem Services Framework: Scenario Analysis and Green Accounting." In *Federal Resource Management and Ecosystem Services Guidebook*, edited by Lydia Olander. Durham, NC: National Ecosystem Services Partnership, Duke University, 2014.
- Pendleton, L, B. Murray, D. Gordon, D. Cooley and T. Vegh. 2014. "Harnessing the Financial Value of Coastal 'Blue' Carbon." Chapter 17, in *Valuing Ecosystem Services: Methodological Issues and Case Studies*. Edward Elgar.
- Estrada, M, D. Lee, B. Murray, R. O'Sullivan, J Penman, and C Streck. 2014. *Land Use in a Future Climate Agreement*. Prepared with support from cooperative agreement # S-LMAQM-13-CA-1128 with U.S. Department of State.
- Murray, B.C. 2014. "Pigouvian Taxes." In *Environmental and Natural Resource Economics: An Encyclopedia*. ABC CLIO.
- Murray, B.C. 2014. "Kenneth Boulding." In *Environmental and Natural Resource Economics: An Encyclopedia*. ABC CLIO.
- Murray, B.C., P.T. Maniloff, J. Monast. 2013. "Design Issues for Linking Carbon Markets," chapter in *Designing Integration: Regional Governance on Climate Change in North America*. University of Toronto Press.
- Nordhaus, W.D., S.A. Merrill, and P.T. Beaton, (Ed's); M.L Cropper, F. de la Chesnaye, N. Diffenbaugh, D.G. Hawkins, R.F. Mann, B.C. Murray, J.M. Reilly, D. Shindell, E. Toder, R.C. Williams III, C. Wolfram. 2013. *Effects of U.S. tax Policy on Greenhouse Gas Emissions*. National Research Council of the National Academies. The National Academies Press, Washington, DC. www.nap.edu.
- Murray, B.C. 2013. "Economics of Forest Carbon Sequestration as a Climate Change Mitigation Strategy." In *Encyclopedia of Energy, Natural Resource and Environmental Economics*. Elsevier.
- Beudoin, Y., L. Pendleton and 29 contributing authors (including B. Murray). 2012. *Why Value the Oceans?* Prepared for The Economics of Ecosystems and Biodiversity (TEEB) by UNEP/GRID- Arendal and Duke University's Nicholas Institute for Environmental Policy Solutions.

- Beach, R., D. Adams, R. Alig, J. Baker, G. Latta, B. McCarl, B. Murray, S. Rose, and E. White. 2011. *Model Description for the Forest and Agricultural Sector Optimization Model with Greenhouse Gases (FASOMGHG)*. U.S. Environmental Protection Agency Climate Change Division.
- Baker, J.S. and B.C. Murray. 2012. "An Emissions-intensity Approach for Crediting Greenhouse Gas Mitigation and Agriculture: Reconciling Climate and Food Security Objectives in the Developing World," Chapter 21 in *Climate Change Mitigation in Agriculture*. (Wollenberg, E, Nihart, A, Tapio-Biström, ML, Grieg-Gran, M, eds). Earthscan, London.
- Murray, B.C. 2010. "Emissions Offsets in a Greenhouse Gas Cap-and-Trade Policy." In *Issues of the Day: 100 Commentaries on Climate, Energy, the Environment, Transportation, and Public Health Policy*, I.W.H Parry and F. Day (eds.), p. 30-31. RFF Press, Resources for the Future, Washington, DC.
- Murray, B.C. 2009. "Leakage from an Avoided Deforestation Compensation Policy: Concepts, Empirical Evidence, and Corrective Policy Options," chapter in *Avoided Deforestation: Prospects for Mitigating Climate Change*, C. Palmer and S. Engel, (eds). (Oxford, UK: Routledge).
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- Sohngen, B., M. Gytarsky, G. Korovin, L Laestadius, B. Murray, A. Utkin, D. Zamolodchikov. 2005. *Stocks and Flows: Carbon Inventory and Mitigation Potential of the Russian Forest and Land Base*. World Resources Institute, Washington, DC (available at www.wri.org).
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- Ross, M.T., B.C. Murray, R.H. Beach, and B.M. Depro. Forthcoming. "State-level Economic Impacts of Global Climate Change Policies: Analysis of the Climate Stewardship Act of 2003." Pew Center on Global Climate Change.
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- Lee, H-C, B.A. McCarl, D. Gillig, and B. Murray. 2006. "U.S. Agriculture and Forestry Greenhouse Mitigation Over Time." In *Rural Lands, Agriculture and Climate beyond 2015: Usage and Management Responses*, F. Brouwer and B.A. McCarl (eds.), Dordrecht, The Netherlands: Kluwer Academic Publishers.
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- Murray, B.C., and J.P. Prestemon. 2003. "Timber Market Structure and Efficiency: Theory and Evidence." Chapter 10 in *Forests in a Market Economy*, Kluwer.
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- Murray, B.C. "Regional Carbon Markets in North America." Presented at University of British Columbia, Vancouver, BC. March 11, 2015.
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- Murray, B.C. "Regional Carbon Markets in North America: Interim stop or final destination?" Presented at University of Ottawa Institute of Environment., Ottawa, ON, Feb 10, 2015.
- Murray, B.C. "Market Mechanisms 101: Possible Applications under the Clean Power Plan." Online webinar Wednesday, Dec. 10, 2014. Available online at <http://youtu.be/0ECOCZAwxA4>.
- Murray, B.C. "The Role of Forest Carbon in Climate Policy." Presented at Duke University SAF Symposium. November 14, 2014
- Murray, B.C and J.M. Monast. "EPA's Clean Power Plan & the Electricity Sector." Presented at Duke Environmental Leadership Program Alumni Event, Duke University, November 14, 2014.
- Murray, B.C. Commentator, "China and the Environment: Panel on Emerging Environmental Policy Issues in China." Duke University, Sept 19, 2014.
- Murray, B.C. "Can Subnational Cooperation Solve Climate Change? Evidence from the RGGI Program in the U.S." Fulbright chair keynote talk, University of Ottawa September 4, 2014.

- Murray, B.C. “Review of EPA’s Economic Analysis of Clean Power Plan - 111(d) proposal.” Presented at the Southeast Energy and Environmental Leadership Forum - Charleston, South Carolina, June 27, 2014.
- Estrada, M, D. Lee, B. Murray, R. O’Sullivan, J. Penman, and C. Streck. “Land Use in a Future Climate Agreement.” Presented at side event for the UN FCCC Subsidiary Body on Scientific and Technical Advice, Bonn Germany, June 10, 2014.
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- Murray, B.C. “Valuing Carbon Sequestration Benefits in Terrestrial and Marine Ecosystems” Online webinar for the Conservation Economics Initiative. February 10, 2014.
- Murray, B.C. “How Effective are U.S. Renewable Energy Subsidies in Cutting Greenhouse Gases?” Presented at the American Economics Association Meetings, January 4, 2014, Philadelphia, PA.
- Murray, B.C. “The Changing Climate of Climate Change Policy.” Presented at 38th Annual EPA-A&WMA Information Exchange, Research Triangle Park, NC, December 10, 2013
- Murray, B.C. “Ecosystem Services: Economic Value, Payments and Markets.” Presented at Water Sector Environmental Benefit-Cost Workshop Inter-American Development Bank, Washington D.C., November 19, 2013.
- Murray, B.C. “Use of Integrated Economic Modeling in Biofuel Life Cycle Assessment.” CRC Workshop on Biofuels LCA. Argonne National Laboratory, IL. Oct 15-17, 2013.
- Murray, B.C. “Modeling and Analysis for Insights on 111(d) Policy Options.” Regulating Carbon Dioxide Emissions under Section 111(d) of the Clean Air Act. NI Event. Cincinnati, Ohio. July 29, 2013.
- Murray, B.C. Panel discussion on the Allowance Reserve mechanism under the California cap-and-trade regulation. California Air Resources Board, Sacramento, CA. June 25, 2013.
- Murray, B.C. “Why Have Greenhouse Emissions in RGGI States Declined? An Econometric Attribution to Macroeconomic, Energy Market and Policy Factors”. Association of Environmental and Resource Economics Summer Conference, Banff, Alberta, Canada. June 8, 2013.
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- Murray, B.C. “Mechanisms for Handling Permanence Risk for Forest Carbon Projects.” Seminar Presentation, Resources for the Future, Washington DC, May 21, 2013
- Murray, B.C. “How Well do Protected Areas Reduce Mangrove Loss? An Examination of Indonesia using Quasi-experimental Methods.” Seminar Presentation, Resources for the Future, Washington DC, May 20, 2013
- Murray, B.C. “Economics of Blue Carbon: Using climate mitigation incentives to protect coastal and marine ecosystems.” Remote presentation to International Blue Carbon Scientific Working Group, May 15-17, 2013, Sydney, Australia.
- Murray, B.C. “Using spatial economic models to estimate biogas supply potential at different scales.” Duke University Energy Workshop, Durham, NC, May 7, 2013
- Murray, B.C. “Blue Carbon: Biophysical Potential and Economic Incentives.” Sustainable Ocean Summit, Washington, DC, April 24, 2013
- Murray, B.C. “Provisioning: Market Pricing and Cost Containment Mechanisms.” Panelist, *Navigating the American Carbon World 2013*. San Francisco, CA. April 17, 2013
- Murray, B.C. “Economic Analysis of Sustainable Landscape Projects.” Presented at USAID Training Course on Cost-Benefit Analysis (CBA) and the Economics of Climate Change Mitigation. Bethesda, MD. March 4, 2013.
- Murray, B.C. “Options for Addressing Reversal (Non-permanence) Risks in the FCPF Carbon Fund Methodological Framework.” The World Bank Group Workshop Washington, DC. Feb 1, 2013
- Murray, B.C. “Blue Carbon: From Biophysical Potential to Economic Potential to Real Outcomes on the Ground (or Water).” Presented at COP 18, Doha, Qatar Joint Session with IUCN: Mitigation through coastal marine ecosystem management - status and pathways. November 30, 2012
- Murray, B.C. “Economics of Forest Carbon and REDD.” Conservation Strategies Fund Economic Tools for Conservation Course, Stanford University, August 25, 2012
- Murray, B.C. “Economic incentives for ecosystem services: Where nature, policy, markets and reality meet.” Presented at Biogeomon Conference, Northport, ME, July 19, 2012
- Murray, B.C. “The Net Global Effects of Alternative U.S. Biofuel Mandates: Fossil Fuel Displacement, Indirect Land Use Change, and the Role of Agricultural Productivity Growth.” Association of Environmental and Resource Economics Summer Meeting, Asheville, NC; June 4, 2012.
- Murray, B.C. and C.S. Galik. “Addressing Carbon Reversals in Land Use, Land-Use Change and Forestry Activities: An Options Assessment.” Presented at The World Bank, Washington, D.C., April 24, 2012

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Murray, B.C. “Cost containment reserve: features and design issues.” RGGI Learning Session on Flexibility Mechanisms, New York City, January 24, 2012.

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