BRYAN J. HUBBELL

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1. ACADEMIC HISTORY

A. Name: Bryan J. Hubbell

B. Current Position: Senior Fellow, Resources for the Future

C. Education:

1. Ph.D., Economics, North Carolina State University, 1995.

   Dissertation title: *A Discrete/Continuous Model of Insecticide Selection and Use Levels: Decisions by U.S. Apple Growers*

2. M.E., Economics, North Carolina State University, 1992.

3. B.A. (with honors), Appalachian State University, Political Science (minor in Economics), 1989.

D. Positions:

1. Senior Fellow, Resources for the Future. January 2026-present. Conduct research on the benefits and costs of air pollution policies; health impacts of climate change; evaluation of climate change adaptation and resilience programs. Communicate to a wide range of technical, policy, and public audiences through blog posts, reports, and presentations.
2. Air, Climate, and Energy National Program Director, Office of Research and Development, U.S. Environmental Protection Agency, 2019-2025. Lead $100 million national research program to provide scientific and technical information critical to improve air quality, reduce the impacts of air pollutants and greenhouse gases on human health and ecosystems, reduce environmental and health inequities, and respond to impacts of climate change and transformations of the energy and transportation infrastructure. Directs all aspects of research planning, including development of research strategies, development of research activities, engagement with stakeholders, and funding plans. Represent the science conducted by the program to academic organizations, states, federal agencies, congress, and multi-jurisdictional organizations through webinars, speeches, and written commentaries. Engage with federal, state, tribal, and community partners to ensure that research results in high quality, useable information to support decision making.

3. Senior Advisor on Social Science, Immediate Office of the Assistant Administrator, Office of Research and Development, U.S. Environmental Protection Agency, 2017-

2019. Advisor to the ORD Associate Director for Science on a broad range of scientific, economic and technical issues involving social sciences research and applications as they relate to ORD activities. Provides expert advice and assistance on matters relating to the development of social science research proposals and building capacity in social science disciplines in ORD. Advises ORD senior management, including the National Program Directors, the Associate Director for Science, and the Assistant Administrator for ORD on actions to facilitate integration of social and natural science research programs. Coordinates with ORD research programs and laboratories to help identify and express social science research priorities. Works with research programs and laboratories to ensure delivery of accessible and actionable results of ORD scientific research projects.

4. Senior Advisor for Science and Policy Analysis, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, 2006-2010, 2014-2017. Advisor to the HEID Division Director on a broad range of science, economic, and technical analytical issues related to policy formulation. Served as a liaison on these issues across the division, with other OAQPS divisions, with other EPA offices, and with external stakeholders, such as the Health Effects Institute. Served as primary OAQPS liaison with the EPA Office of Research and Development. Analyzed scientific, economic and technical issues involving review and implementation of health and environmental standards and regulations for criteria and toxic air pollution and advised the Division Director on issues that may affect current or future Divisional program activities. Provided expert advice and assistance on matters relating to the development of risk assessments, health impact, benefit-cost, and regulatory impact analyses for regulatory programs.

5. Science Associate (detail), Office of Research and Development, Air Climate and Energy Program, October 2015 – May 2016. Developed white paper on how ORD can strengthen the foundations for interdisciplinary social-environmental research and an accompanying action plan. Began implementing the action plan through development of the EPA Social-Environmental Science Exchange, the EPA Social Sciences Online Toolbox, and a pilot interdisciplinary, multi-stakeholder problem formulation workshop.

6. Leader, Risk and Benefits Group, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, 2010-2014. Managed the group responsible for conducting and communicating the results of exposure, risk, and benefits analyses for primary air pollutants in support of NAAQS related rules, including standard setting and implementation, and air toxics rules, including MACT and residual risk rules, and new source performance standards. Oversaw development of state of the art tools for exposure assessment (primarily the Air Pollution Exposure Model – APEX) and benefits assessment (the environmental Benefits Mapping Analysis Program – BenMAP). Supported health impact and benefits analyses for international programs, including those focused on evaluation of short lived climate pollutants.

7. Economist, Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, 1998-2006. National expert in

environmental and health benefits analysis. Responsible for conducting benefits analyses of national criteria and hazardous air pollution regulations. Also charged with developing and updating methods for benefits analysis, health impact assessments, and environmental and ecological impact assessments.

8. Graduate Faculty, University of North Carolina, 2010-2019

9. Adjunct Assistant Professor, Department of Agricultural and Resource Economics, North Carolina State University, 1998-present.

10. Visiting Scientist, Department of Agricultural and Resource Economics, North Carolina State University, December, 1997-February, 1998.

11. Assistant Professor, Department of Agricultural and Applied Economics, University of Georgia, 1995-1998.

12. Research Assistant, Department of Agricultural and Resource Economics, North Carolina State University, 1990-1995.

13. Research Technician, Bowman Gray School of Medicine, Wake Forest University, 1989-1990.

2. SCHOLARLY ACTIVITIES

A. Publications

1. Refereed Journal Articles (Google Scholar h-index 39, i10-index 65, 24 publications with over 100 citations)

Kenney MA, Kopp RE, Samaras C., … **Hubbell B**, …et al. 2026. Research priorities for robust climate assessments in the United States. Earth's Future, 14(9), e2025EF007336. https://doi.org/10.1029/2025EF007336

Hunt S, Sacks JD, Hagler GSW, **Hubbell B**. 2026. Burning Questions: Research Data, Tools, and Insights Needed to Reduce Environmental Exposures and Public Health Risks from Wildland Fires in the United States. Environmental Science & Technology, 60(22): 15495-15503. https://doi.org/10.1021/acs.est.5c09816

Turner, M. W., Dodder, R., Miller, A., Rivera, A., & **Hubbell, B**. 2025. Climate Change Impacts on Environmental Protection at the U.S. Environmental Protection Agency: A Horizon Scan. *World Futures Review*, *0*(0). https://doi.org/10.1177/19467567251365489

Canfield KN, **Hubbell B**, Rivers L, Rodan B, Hassett-Sipple B, Rea A, Gleason T, Holder A, Berg C, Chatelain CD, Coefield S, Schmidt B, McCaughey B, 2024. Lessons learned and recommendations in conducting solutions-driven environmental and public

health research. Journal of Environmental Management, 354:120270, https://doi.org/10.1016/j.jenvman.2024.120270

Angie Shatas A, **Hubbell B**, 2022: Using Low-Cost Sensor Networks: Considerations to Help Reveal Neighborhood-Level Exposure Disparities. American Journal of Public Health 112, 1693_1695, https://doi.org/10.2105/AJPH.2022.307128

Hagiwara, S., Paoli, G. M., Price, P. S., Gwinn, M. R., Guiseppi-Elie, A., Farrell, P. J., **Hubbell, B. J**., Krewski, D., & Thomas, R. S. (2022). A value of information framework for assessing the trade-offs associated with uncertainty, duration, and cost of chemical toxicity testing. Risk Analysis, 1– 18. https://doi.org/10.1111/risa.13931

Paul S. Price, **Bryan J. Hubbell**, Shintaro Hagiwara, Greg M. Paoli, Daniel Krewski, Annette Guiseppi-Elie, Maureen R. Gwinn ,Norman L. Adkins, Russell S. Thomas. 2021. A Framework that Considers the Impacts of Time, Cost, and Uncertainty in the Determination of the Cost Effectiveness of Toxicity-Testing Methodologies. Risk Analysis. First published: 07 September 2021 https://doi.org/10.1111/risa.13810

Kristen M. Rappazzo, Lisa Baxter, Jason D. Sacks, Breanna L. Alman, Geoffrey Colin L. Peterson, **Bryan Hubbell**, Lucas Neas. 2021. Exploration of PM mass, source, and component-related factors that might explain heterogeneity in daily PM2.5-mortality associations across the United States. Atmospheric Environment, Volume 262, 118650. https://doi.org/10.1016/j.atmosenv.2021.118650.

William M. P. Klein, Alycia K. Boutté, Heather Brake, Madeline Beal, Katherine Lyon-Daniel, Emily Eisenhauer, Monica Grasso, **Bryan Hubbell**, Karen E. Jenni, Christopher J. Lauer, Arthur W. Lupia, Christine E. Prue, Paula Rausch, Carl D. Shapiro, Michael D. Smith & William T. Riley Leveraging risk communication science across US federal agencies. Nat Hum Behav 5, 411–413 (2021). https://doi.org/10.1038/s41562-021-01081-0

Anna Belova, Neal Fann, Jacqueline Haskell, **Bryan Hubbell**, and Tulika Narayan. 2020. Estimating Lifetime Cost of Illness. An Application to Asthma. Annals of the American Thoracic Society. 17(12). https://doi.org/10.1513/AnnalsATS.201910-729OC

Hano Mary Clare, Prince Steven E., Wei Linda, **Hubbell Bryan J**., Rappold Ana G. 2020. Knowing Your Audience: A Typology of Smoke Sense Participants to Inform Wildfire Smoke Health Risk Communication. Frontiers in Public Health. Volume 8. https://www.frontiersin.org/article/10.3389/fpubh.2020.00143
DOI=10.3389/fpubh.2020.00143

Hano, M.C., Baghdikian, C.L., Prince, S., Lazzarino, E., **Hubbell, B.,** Sams, E., Stone, S., Davis, A. and Cascio, W.E., 2019. Illuminating stakeholder perspectives at the intersection of air quality health risk communication and cardiac rehabilitation. International Journal of Environmental Research and Public Health, 16(19), p.3603.

Rappold, A. G., Hano, M. C., Prince, S., Wei, L., Huang, S. M., Baghdikian, C., B. Stearns, X. Gao, S. Hoshiko , W.E. Cascio, D. Diaz-Sanchez, and B. Hubbell (2019). Smoke Sense Initiative Leverages Citizen Science to Address the Growing Wildfire-Related Public Health Problem. GeoHealth, 3 https://doi.org/10.1029/2019GH000199

Keely Maxwell, **Bryan Hubbell**, Emily Eisenhauer. 2019. Institutional insights on integrating social and environmental science for solutions-driven research. Environmental Science & Policy, Volume 101, Pages 97-105, https://doi.org/10.1016/j.envsci.2019.08.003.

Richard Burnett, Hong Chen, Mieczysław Szyszkowicz, Neal Fann, **Bryan Hubbell**, C. Arden Pope, Joshua S. Apte, Michael Brauer, Aaron Cohen, Scott Weichenthal, Jay Coggins, Qian Di, Bert Brunekreef, Joseph Frostad, Stephen S. Lim, Haidong Kan, Katherine D. Walker, George D. Thurston, Richard B. Hayes, Chris C. Lim, Michelle C. Turner, Michael Jerrett, Daniel Krewski, Susan M. Gapstur, W. Ryan Diver, Bart Ostro, Debbie Goldberg, Daniel L. Crouse, Randall V. Martin, Paul Peters, Lauren Pinault, Michael Tjepkema, Aaron van Donkelaar, Paul J. Villeneuve, Anthony B. Miller, Peng Yin, Maigeng Zhou, Lijun Wang, Nicole A. H. Janssen, Marten Marra, Richard W. Atkinson, Hilda Tsang, Thuan Quoc Thach, John B. Cannon, Ryan T. Allen, Jaime E. Hart, Francine Laden, Giulia Cesaroni, Francesco Forastiere, Gudrun Weinmayr, Andrea Jaensch, Gabriele Nagel, Hans Concin, Joseph V. Spadaro. 2018. Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter. Proceedings of the National Academy of Sciences Sep 2018, 201803222; DOI: 10.1073/pnas.1803222115. http://www.pnas.org/content/early/2018/08/28/1803222115

Sacks JD, Lloyd JM, Zhu Y, Anderton J, Jang C, **Hubbell B**, Fann N. 2018. The Environmental Benefits Mapping and Analysis Program – Community Edition (BenMAP–CE): A Tool to Estimate the Health and Economic Benefits of Reducing Air Pollution. Environmental Modelling and Software. 104:118-129. https://doi.org/10.1016/j.envsoft.2018.02.009

Hubbell BJ, Kaufman A, Rivers L, Schulte K, Hagler G, Clougherty J, Cascio W, Costa D. 2017. Understanding social and behavioral drivers and impacts of air quality sensor use. Sci Total Environ. 621:886-894. doi:10.1016/j.scitotenv.2017.11.275.

Cohen AJ, Brauer M, Burnett R, Anderson HR, Frostad J, Estep K, Balakrishnan K, Brunekreef B, Dandona L, Dandona R, Feigin V, Freedman G, **Hubbell B**, Jobling A, Kan H, Knibbs L, Liu Y, Martin R, Morawska L, Pope CA 3rd, Shin H, Straif K, Shaddick G, Thomas M, van Dingenen R, van Donkelaar A, Vos T, Murray CJL, Forouzanfar MH. 2017. Estimates and 25-year trends of the global burden of disease attributable to ambient air pollution: an analysis of data from the Global Burden of Diseases Study 2015. Lancet. 389:1907-1918.

Wilson A, Reich BJ, Nolte CG, Spero TL, **Hubbell B**, Rappold AG. 2017. Climate change impacts on projections of excess mortality at 2030 using spatially varying ozone-

temperature risk surfaces. Journal of Exposure Science and Environmental Epidemiology, 27(1):118-124.

Nasari MM, Szyszkowicz M, Chen H, Crouse D, Turner MC, Jerrett M, Pope III CA, **Hubbell B** , Fann N, Cohen A , Gapstur SM, Diver WR, Stieb D, Forouzanfar MH, Kim SY, Olives C, Krewski D, Burnett RT. 2016. A Class of Non-Linear Exposure-Response Models Suitable for Health Impact Assessment Applicable to Large Cohort Studies of Ambient Air Pollution. Air Quality, Atmosphere and Health. 9: 961-972.

Simon H, Wells B, Baker KR, **Hubbell B**. 2016. Assessing temporal and spatial patterns of observed and predicted ozone in multiple urban areas. Environmental Health Perspectives. 124:1443–1452.

Shin, H. H., Cohen, A. J., Pope, C. A., Ezzati, M., Lim, S. S., **Hubbell, B. J.** and Burnett, R. T. (2016), Meta-Analysis Methods to Estimate the Shape and Uncertainty in the Association Between Long-Term Exposure to Ambient Fine Particulate Matter and Cause-Specific Mortality Over the Global Concentration Range. Risk Analysis, 36(9): 1813-1825. doi: 10.1111/risa.12421

Fann, N., Wesson, K., & **Hubbell, B.** (2016). Characterizing the confluence of air pollution risks in the United States. Air Quality, Atmosphere & Health, 9:293-301.

Crouse DL, Philip S, van Donkelaar A, Martin RV, Jessiman B, Peters PA, Weichenthal S, Brook JR, **Hubbell B**, Burnett RT. 2015. A New Method to Jointly Estimate the Mortality Risk of Long-Term Exposure to Fine Particulate Matter and its Components. Scientific Reports. 6: 18916.

GBD 2013 Risk Factors Collaborators (MH Forouzanfar, ….. **BJ Hubbell**, …..) Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. 2015. The Lancet. 386(10010): 2287-2323.

Jhun, I., Coull, B. A., Schwartz, J., **Hubbell, B**., & Koutrakis, P. (2015). The impact of weather changes on air quality and health in the United States in 1994–2012. Environmental Research Letters, 10(8), 084009.

Loughlin, D. H., Kaufman, K. R., Lenox, C. S., & **Hubbell, B. J.** (2015). Analysis of alternative pathways for reducing NOx emissions. Journal of the Air & Waste Management Association, 65(9): 1083-93.

Hubbell, B and D Greenbaum. 2014. Invited Commentary: Moving from Potential-Outcomes Thinking to Doing: Changing Research Planning to Enable Successful Health Outcomes Research. American Journal of Epidemiology. 180(12): 1141-1143.

Hwashin HS, Neal Fann, Rick Burnett, Aaron Cohen, and **Bryan Hubbell**. 2014. Outdoor Fine Particles and Nonfatal Strokes: Systematic Review and Meta-Analysis. Epidemiology. 25(6):835-42.

Jhun I, Neal Fann, Antonella Zanobetti, and **Bryan Hubbell**. 2014. Effect Modification of Ozone-Related Mortality Risks by Temperature in 97 US cities. Environment International. 73: 128-134.

Foley KM, SL Napelenok, C Jang, S Phillips, **BJ Hubbell**, and CM Fulcher. 2014. Two Reduced Form Air Quality Modeling Techniques for Rapidly Calculating Pollutant Mitigation Potential across Many Sources, Locations, and Precursor Emission Types. Atmospheric Environment, 98:283-289.

Richard T. Burnett, C. Arden Pope III, Majid Ezzati, Casey Olives, Stephen S. Lim, Sumi Mehta, Hwashin H. Shin, Gitanjali Singh, **Bryan Hubbell**, Michael Brauer, H. Ross Anderson, Kirk R. Smith, John R. Balmes, Nigel G. Bruce, Haidong Kan, Francine Laden, Annette Prüss-Ustün, Michelle C. Turner, Susan M. Gapstur, W. Ryan Diver, and Aaron Cohen. 2014. An Integrated Risk Function for Estimating the Global Burden of Disease Attributable to Ambient Fine Particulate Matter Exposure. Environmental Health Perspectives 122(4):397–403 (2014)

Scheffe, R.D., J.A. Lynch, A. Reff, J.T. Kelly, **B. Hubbell**, T.L. Greaver, J.T. Smith. 2014. The Aquatic Acidification Index: A New Regulatory Metric Linking Atmospheric and Biogeochemical Models to Assess Potential Aquatic Ecosystem Recovery. Water Air Soil Pollut (2014) 225(2): 1-15.

Stephen S Lim, Theo Vos, …, Damian Hoy, Howard Hu, **Bryan J Hubbell**, Sally J Hutchings,…, et al. 2012. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet 12/2013; 380(9859):2224-60.

Hubbell, B. 2012. Assessing the Results of Air Quality Management Programs. EM. October, pp. 8-15.

Johns DO, Stanek LW, Walker K, Benromdhane S, **Hubbell B**, et al. 2012. Practical Advancement of Multipollutant Scientific and Risk Assessment Approaches for Ambient Air Pollution. Environ Health Perspect doi:10.1289/ehp.1204939

Hubbell, B. 2012. Understanding urban exposure environments: new research directions for informing implementation of U.S. air quality standards. Air Quality, Atmosphere & Health DOI: 10.1007/s11869-011-0153-4

Fann N, Bell ML, Walker K, **Hubbell B** 2011. Improving the Linkages between Air Pollution Epidemiology and Quantitative Risk Assessment. Environ Health Perspect 119(12):1671-5.

Fann, N., HA Roman, CM Fulcher, MA Gentile, **BJ Hubbell**, K Wesson, and JI Levy. 2011. Maximizing Health Benefits and Minimizing Inequality: Incorporating Local-Scale Data in the Design and Evaluation of Air Quality Policies. Risk Analysis. May.

Fann N, Amy Lamson, Susan Anenberg, Karen Wesson, David Risley, and **Bryan Hubbell**. 2011. Estimating the National Public Health Burden Associated with Exposure to Ambient PM2.5 and Ozone. Risk Analysis. May.

Voorhees, A Scott; Fann, Neal; Fulcher, Charles; Dolwick, Patrick; **Hubbell, Bryan**; Bierwagen, Britta; Morefield, Philip. 2011. Climate Change-Related Temperature Impacts on Warm Season Heat-Mortality: A Proof-of-Concept Methodology Using BenMAP. Environmental Science and Technology. January.

P.L. Kinney, H.A. Roman, K.D. Walker, H.M. Richmond, L. Conner, **B.J. Hubbell**. (2010). "On the use of expert judgment to characterize uncertainties in the health benefits of regulatory controls of particulate matter" Environmental Science & Policy, 13: 434-443.

Gwinn MR, Craig J, Axelrad DA, Cook R, Dockins C, Fann N, Robert Fegley, David E. Guinnup, Gloria Helfand, **Bryan Hubbell**, Sarah L. Mazur, Ted Palma, Roy L. Smith, John Vandenberg, Bob Sonawane. 2010. Estimating the Benefits of Reducing Hazardous Air Pollutants: Summary of 2009 Workshop and Future Considerations. Environ Health Perspect :-. doi:10.1289/ehp.1002468

Hubbell, B., R. Crume, D. Evarts, and J. Cohen. 2010. Policy Monitor: Regulation and Progress under the 1990 Clean Air Act Amendments. Review of Environmental Economics and Policy, volume 4, issue 1, winter 2010, pp. 122–138

Fann, N., C. Fulcher, and **B. Hubbell**. 2009. The influence of location, source, and emission type in estimates of the human health benefits of reducing a ton of air pollution. *Air Quality, Atmosphere, and Health* (2009) 2:169–176.

Hubbell, B., N. Fann, and J. Levy. Methodological Considerations in Developing Local-Scale Health Impact Assessments: Balancing National, Regional, and Local Data. *Air Quality, Atmosphere, and Health.* (2009) 2:99–110

Halûk Özkaynak, H. Christopher Frey, and **Bryan Hubbell**. Characterizing Variability and Uncertainty in Exposure Assessments Improves Links to Environmental Decision-Making. EM. July, 2008, pp. 18-22.

Roman, H.A., K.D. Walker, T.L. Walsh, L. Conner, H.M. Richmond, **B.J. Hubbell**, and P.L. Kinney. 2008. An Expert Judgment Assessment of the Mortality Impact of Changes in Ambient Fine Particulate Matter in the U.S. *Environmental Science and Technology*, 42 (7), 2268–2274.

Scheffe, R., **B. Hubbell**, T. Fox, V. Rao, and W. Pennell. The Rationale for a Multipollutant, Multimedia Air Quality Management Framework. *EM*. May 2007, pp 14-20.

Bateson TF, Coull BA, **Hubbell B**, Ito K, Jerrett M, Lumley T, Thomas D, Vedal S, Ross M. Panel discussion review: session three - issues involved in interpretation of epidemiologic analyses - statistical modeling. *Journal of Exposure Science and Environmental Epidemiology* 17(2007):S90-S96.

Kochi, I., **B. Hubbell**, and R. Kramer. "An Empirical Bayes Approach to Combining and Comparing Estimates of the Value of a Statistical Life for Environmental Policy Analysis." *Environmental and Resource Economics.* 34(2006): 385-406.

Hubbell, B. Implementing QALYs in the Analysis of Air Pollution Regulations. *Environmental and Resource Economics*. 34(2006): 365-384.

Davidson K, Hallberg A, McCubbin D, **Hubbell B**. Analysis of PM2.5 Using the Environmental Benefits Mapping and Analysis Program (BENMAP). *Journal of Toxicology and Environmental Health* (2005) 203-205.

Hubbell, B., A. Hallberg, D. McCubbin, and E. Post. "Health Related Benefits of Attaining the Eight-hour Ozone Standard" *Environmental Health Perspectives*, 113(2005): 73-82. [Online 7 October 2004]

Welsh, R., **B. Hubbell**, and C.L. Carpentier. "Agro-food system restructuring and the geographic concentration of US swine production." *Environment and Planning A*, 35(2003): 215 – 229.

Welsh, R., C.L. Carpentier and **B. Hubbell**. "On the effectiveness of state anti-corporate farming laws in the United States." *Food Policy*, 26(2001): 543-548.

Hubbell, B.J., W.J. Florkowski, R. Oetting, S. Braman, and C. Robacker. "Implications of Lawn Care and Landscape Maintenance Firm Profiles for Adoption of Pest Management Practices." *Journal of Agricultural and Applied Economics*, 33(2001): 147-159.

Michele C. Marra, **Bryan J. Hubbell**, and Gerald A. Carlson. "Information Quality, Technology Depreciation, and Bt Cotton Adoption in the Southeast." *Journal of Agricultural and Resource Economics.* 26(2001): 158-175.

Hubbell, B.J., M.C. Marra, and G.A. Carlson. "Estimating the Demand for a New Technology: Bt Cotton and Insecticide Policies." *American Journal of Agricultural Economics.* 82(2000): 118-132.

Adote, N.A., **B.J. Hubbell**, and J.L. Jordan. "Joint Production and Averting Expenditure Measures of WTP: Do Water Expenditures Really Measure Avoidance Costs?" *American Journal of Agricultural Economics*. 82(2000): 427-437 .

Welsh, R. and **B.J. Hubbell**. "Contract Hog Production and Environmental Management in the Southern United States." *Agronomy Journal*, 91(1999): 883-888.

Hubbell, B. J. and G. A. Carlson. "Effects of Insecticide Attributes on Within-season Insecticide Product and Rate Choices: The Case of U.S. Apple Growers." *American Journal of Agricultural Economics* 80(1998):

Hubbell, B.J. and R. Welsh. "Trends in Geographic Concentration of Hog Production, 1975-1995." *Journal of Agricultural and Applied Economics* 30(1998): 285-299.

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2. Reports and regulatory documents (principal author or substantive co-author)

Raimi D, Joiner E, Hubbell B, Lohawala N, Robertson M. 2026. Global Energy Outlook 2026: How the World Lost the Goal of 1.5°C. Resources for the Future Report. https://www.rff.org/publications/reports/global-energy-outlook-2026/

Hubbell B, Krupnick A. 2026. How the US Environmental Protection Agency Got It Wrong About Monetizing Benefits of Air Pollution Regulations. Resources for the Future Report. https://www.rff.org/publications/reports/how-the-us-environmental-protection-agency-got-it-wrong-about-monetizing-benefits-of-air-pollution-regulations/

Air, Climate, and Energy Strategic Research Action Plan Fiscal Years 2023-2026. 2022. US Environmental Protection Agency, Office of Research and Development. EPA/600/R-22/234.

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Chapters 9 and 10, *Regulatory Impact Analysis for the Final Regional Haze Rule*. Office of Air Quality Planning and Standards, April, 1999.

Chapter 7, *Regulatory Impact Analysis: Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements*. Office of Mobile Sources, December, 1999.

Chapters 11 and 12, Appendix A of the *Regulatory Impact Analysis for the Final Section 126 Petition Rule.* Office of Air Quality Planning and Standards, Decmber, 1999.

Chapter 7, *Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. Office of Air and Radiation. (available on the internet at http://www.epa.gov/otaq/diesel.htm).

Chapter 7, *Regulatory Impact Analysis of the Plywood and Composite Wood Products NESHAP*, Office of Air Quality Planning and Standards, September, 2000.

Chapter 8, *Regulatory Impact Analysis of the Proposed Reciprocating Internal Combustion Engines NESHAP*, Office of Air Quality Planning and Standards, November, 2002.

Chapter 10, *Regulatory Impact Analysis of the Proposed Industrial Boilers NESHAP*, Office of Air Quality Planning and Standards, November, 2002.

Chapter 9, Appendix 9A, B, and C of the *Regulatory Impact Analysis for the Final Nonroad Land-based Diesel Engine Rule* Office of Air and Radiation, April, 2004.

Chapter 4, Appendices A, B, C, F, and G of the *Regulatory Impact Analysis for the Final Clean Air Interstate Rule*, March, 2005.

Chapter 4, Appendices C, D, E, F of the *Regulatory Impact Analysis for the Final Clean Air Visibility Rule*, June, 2005.

Chapter 5, Appendices G, H, I, J of the *Regulatory Impact Analysis for the 2006 National Ambient Air Quality Standards for Particle Pollution*, October, 2006.

Chapters 6 and 7 of the *Regulatory Impact Analysis for the 2008 National Ambient Air Quality Standards for Ground Level Ozone*, March, 2008.

Chapters 1, 6, and 9 of the *First and Second Draft Policy Assessment for the 2012 National Ambient Air Quality Standards for Nitrogen and Sulfur Oxides. 2010*

Chapters 1, 2, 3, and 9 of the *Risk and Exposure Assessment for the 2014 National Ambient Air Quality Standard for Ozone. 2013*

Chapter 4 of the *Regulatory Impact Analysis for the 2015 Clean Power Plan Final Rule*, August, 2015.

Contributing author of the Appropriate and Necessary Finding for the 2012 Mercury and Air Toxics Standards

B. Contributions other than Formal Publications:

1. Selected Media Appearances

Hubbell B, Krupnick A. (2026, October 6). Silver Linings? How to Seize the Moment to Create Better Environmental Regulations That Are Built on Science and Economics. Resources Magazine. Resources for the Future. https://www.resources.org/archives/silver-linings-how-to-seize-the-moment-to-create-better-environmental-regulations-that-are-built-on-science-and-economics/

Milman, O. and Sneath S. (2026, September 16). Trump EPA's arguments for letting power plants spew unlimited pollution 'dead wrong' [Quotes Bryan Hubbell]. The Guardian. https://www.theguardian.com/environment/2026/sep/16/trump-epa-pollution-rollback

Hubbell, B. (Interviewee). (2026, September 15). EPA eliminates rule limiting greenhouse gas emissions from power plants. Will it change anything? [Radio broadcast interview by Robin Young]. In Here & Now. NPR; WBUR. https://www.wpr.org/shows/here-and-now/epa-power-plant-emissions-climate-change

Skinner, A. (2026, September 14). Map Shows States with Most Coal Plants as EPA Repeals Major Climate Rule [Quotes Bryan Hubbell]. Newsweek. https://www.newsweek.com/map-shows-states-with-most-coal-plants-as-epa-may-repeal-major-climate-rule-12440201

Hubbell, B. (Guest). (2026, August 3). Beyond adaptation plans: Measuring success in the next era of federal climate adaptation (Episode 258) [Audio podcast episode]. In D.

Apgar (Host), *America Adapts: The Climate Change Podcast*. America Adapts Media. https://www.americaadapts.org

Hubbell, B. (2026, July 22). The Costs of Continuing Coal-fired Power in the United States. EconoFact. https://econofact.org/the-costs-of-continuing-coal-fired-power-in-the-united-states

Joselow, M. (2026, July 17). Trump weakens rules limiting harmful air pollution from coal plants [Quotes Bryan Hubbell]. New York Times. https://www.nytimes.com/2026/07/17/climate/trump-wildfire-smoke-health-epa-forest-service.html

Friedman, L. (2026, April 28). The E.P.A.'s Lost Science [Quotes Bryan Hubbell]. New York Times. https://www.nytimes.com/2026/04/28/climate/the-epas-lost-science.html

Friedman, L. (2026, April 27). How the Trump Administration Ended Independent Science at the E.P.A. [Quotes Bryan Hubbell). New York Times. https://www.nytimes.com/2026/04/27/climate/epa-science-trump-cuts.html

Volcovici, V and McLaughlin, T. (2026, April 10). How the AI boom derailed clean-air efforts in one of America's most polluted cities [Quotes Bryan Hubbell]. Reuters. https://www.reuters.com/sustainability/climate-energy/how-ai-boom-derailed-cleanair-efforts-one-americas-most-polluted-cities-2026-04-10/

Hubbell B. In Focus: The Evolution of Air Quality Regulations. Resources for the Future. March 19. https://www.resources.org/in-focus/in-focus-the-evolution-of-air-quality-regulations/

Hubbell B. Exploring Recent Changes to Federal Benefit-Cost Analysis. Resources Radio Episode 363. Resources for the Future. March 17. https://www.resources.org/resources-radio/exploring-recent-changes-to-federal-benefit-cost-analysis-with-bryan-hubbell/

Gearino, D. (2026, March 5). Texas Seizes the Solar Crown From California, and Other Key Points From the Latest Electricity Data [Quotes Bryan Hubbell). Inside Climate News. https://insideclimatenews.org/news/05032026/inside-clean-energy-texas-utility-scale-solar/

Shah, S. (2026, February 20). Trump weakens rules limiting harmful air pollution from coal plants [Quotes Bryan Hubbell]. TIME. https://time.com/7380172/trump-mercury-coal-plant-pollution/

Geman, B. (2026, January 30). The fallout from EPA's pollution shift [Quotes Bryan Hubbell]. Axios. https://www.axios.com/2026/01/30/epa-pollution-shift-public-impact

Root, R. (2026, January 28). The Polluters Down the Street – EPA Changes Put Lives at Risk [Quotes Bryan Hubbell). Nonprofit Quarterly. https://nonprofitquarterly.org/the-polluters-down-the-street-epa-changes-put-lives-at-risk/

Hubbell, B. (Guest). (2026, January 27). Resources for the Future Senior Fellow (and Former EPA Official) Dr. Bryan Hubbell Discusses the EPA's Assault on Clean Air [Audio podcast episode]. In David Introcaso (Host), *The Healthcare Policy Podcast.* https://www.thehealthcarepolicypodcast.com/p/resources-for-the-future-senior-fellow

2. Blog posts

Peplinski M, Hubbell B, McKormack K. 2026. Losing the Endangerment Finding: The Costs and Benefits of Repealing Greenhouse Gas Emissions Standards for Power Plants. Resources for the Future. October 13. https://www.resources.org/common-resources/losing-the-endangerment-finding-the-costs-and-benefits-of-repealing-greenhouse-gas-emissions-standards-for-power-plants/

Hubbell B, Gourevitch J. 2026. Climate Adaptation Policy Needs an Economic Foundation. Resources for the Future. September 10. https://www.resources.org/common-resources/climate-adaptation-policy-needs-an-economic-foundation/

McKormack K, Krupnick A, Linn J, Peplinski M, Hubbell B, Mork D, Fann N, Delaney S. 2026. Losing the Endangerment Finding: Context, Methods, and What's to Come. Resources for the Future. July 13. https://www.resources.org/common-resources/losing-the-endangerment-finding-context-methods-and-whats-to-come/

Hubbell B, Krupnick A, Burtraw D, Raimi D, Bergman A, Palmer K, McCormack K. 2026. If/Then: The Uncertain Future of Coal and What It Means for Climate, Air Quality, and the Energy Economy. February 17. https://www.resources.org/common-resources/ifthen-the-uncertain-future-of-coal-and-what-it-means-for-climate-air-quality-and-the-energy-economy/

Hubbell B, Krupnick A. 2026. If/Then: Ignoring the Benefits of Air Pollution Regulations Will Lead to Worse Policy Decisions. Resources for the Future. January 22. https://www.resources.org/common-resources/ifthen-ignoring-the-benefits-of-air-pollution-regulations-will-lead-to-worse-policy-decisions/

3. Service to Professional Organizations:

Air and Waste Management Association Critical Review Committee, 2026-present
6th National Climate Assessment Agency Chapter Lead, Chapter 6: The Science of Response Management. 2024-2025
California Air Resources Board Research Screening Committee, 2022-present.
Office of Science and Technology Policy Resilience Gamechangers Interagency Workgroup, 2024.

National Science and Technology Committee Social and Behavioral Sciences Subcommittee, 2016-2025.
White House Wildfire Resilience Interagency Workgroup, 2021-2025.
Science Advisory Committee, Harvard ACE Center, 2017-2019.
Adjunct Professor, N.C. State University, 1998-2019.
Member, Graduate Faculty, University of North Carolina, 2010-2019.
Member, Global Burden of Disease Outdoor Air Expert Group, 2009-2019.
Assistant Editor, *American Journal of Agricultural Economics*, 2000-2002.
Editorial Council, *Journal of Agricultural and Applied Economics*, 1998-1999.
Reviewer, *Environment International*, 2026-present
Reviewer, *Science of the Total Environment*, 2023-present.
Reviewer, *Science Advances*, 2023-present.
Reviewer, *The Lancet Planetary Health*, 2018-present.
Reviewer, *Air Quality, Atmosphere and Health*, 2010-present.
Reviewer, *Applied Health Economics and Health Policy*, 2018-present.
Reviewer, *American Journal of Public Health*, 2018-present.
Reviewer, *BMC Public Health*, 2018-present.
Reviewer, *Nature*, 2016-present.
Reviewer, *Nature Climate Change*, 2014-present.
Reviewer, *Nature Communications*. 2023-present.
Reviewer, *Environmental Science and Technology*, 2010-present
Reviewer, *Proceedings of the National Academy of Sciences (PNAS),* 2016-present
Reviewer, *Epidemiology*, 2015-present
Reviewer, *American Journal of Epidemiology*, 2014-present
Reviewer, *Environmental Research Letters*, 2014-present
Reviewer, *Health risks of air pollution in Europe – HRAPIE* (WHO project report)
Reviewer, *Environmental Pollution*, 2013-present
Reviewer, *Environmental Research*, 2014-present
Reviewer, *Environmental Research Communications*, 2018-present
Reviewer, *Journal of Exposure Analysis and Environmental Epidemiology*, 2005 – present.
Reviewer, *Journal of the Air and Waste Management Association*, 2010-present
Reviewer, *Journal of Exposure Science and Environmental Epidemiology,* 2014-presemt
Reviewer, *Environmental Health Perspectives*, 2004 – present.
Reviewer, *Ecological Economics*, 2006 – present.
Reviewer, *American Journal of Agricultural Economics*, 1995-2004.
Reviewer, *Food Policy*, 1996.
Reviewer, *Health Affairs*, 2002.
Reviewer, *Journal of Agricultural and Applied Economics,* 1996-2002.
Reviewer, *Journal of Environmental Economics and Management,* 1997-present.
Reviewer, *Review of Agricultural Economics*, 1996.
Reviewer, *Natural Resource Management and Policy* (Book Series), 1996.
Member, UNECE Convention on Long-Range Transboundary Air Pollution Network of Experts on Benefits and Economics Instruments
Economics Peer Review Panel, NC Attorney General-Smithfield Foods Agreement, 2000-2002.

Sustainable Agriculture Research and Education Technical Advisory Committee, 1997.
National Collegiate Honors Council, Executive Committee, 1989.

2. Guest lecturer

BenMAP Training Program, 2014-2019.

Appalachian State University, Air Pollution and Climate Change, November, 2013

Duke University (Environ 535), Air Quality Management, November, 2013, 2014, 2017

Harvard University, Principles of Environmental Health, Spring 2012, 2013, 2014

Clarkson University, Spring, 2008.

Duke University Graduate Air Quality Management Lecture, Fall, 2007.

NCSU AEC 515 Environmental Economics, Spring 2000.

Duke University Graduate Environmental Economics Lecture, Spring 2000.

UGA AAE 760, Environmental Economics and Policy Analysis - "Environmental Regulations in Agriculture." April 1996.

UGA AEC 480/680, Water Resource Economics - "Valuing Non-market Goods." April 1997.

3. Software Development

BenMAP (environmental Benefits Mapping and Analysis Program): Project Manager and conceptual designer for EPA's state of the art environmental benefits assessment software.

Visual Policy Analyzer (VPA): Project manager and conceptual designer for software for visualization and analysis of response surface modeling outputs.

4. Workshop Development

Wildland Fire Workshop: Burning Questions Driving EPA's Research Directions. US EPA Office of Research and Development. October 29-30, 2024.

Research Triangle Environmental Health Collaborative 2024 Summit: Transitioning to a net-zero energy future in North Carolina: Equity, Environmental, and Economic Considerations. February 5-6, 2024.

EPA Methane Workshop. US EPA Office of Research and Development. February 7-8, 2024.

Interagency Big Data and Social Science Virtual Conference, sponsored by the Federal Interagency Social and Behavioral Sciences Workgroup. September 29-October 1, 2020.

Translational Science Training Workshop. US EPA Office of Research and Development workshop. November 29-30, 2017.

Wildfire Smoke and Health Risk Communication Workshop. US EPA Office of Research and Development workshop. September 22-23, 2016.

Colorado State University Air Pollution Health Impact Assessment Workshop. June 4, 2015.

Designing Research to Assess Air Quality and Health Outcomes from Air Pollution Regulations, January 7-8, 2013. (Joint workshop by USEPA, USCDC, and the Health Effects Institute)

Multipollutant Science and Risk Analysis: Addressing Multiple Pollutants in the NAAQS Review Process. February 2011. (Joint workshop by USEPA and the Health Effects Institute)

2. Doctoral Research Committees

Olha Sydorovych, NC State University, 2005
Susan Anenberg, University of North Carolina, 2010
Iny Juhn, Harvard University, 2013
Raquel Silva, University of North Carolina, 2015

C. Presentations and Briefings:

Hubbell B. Discussion of AWMA Critical Review: Data Fusion in Air Pollution Exposure Assessment. Air and Waste Management Association Annual Conference. Austin, TX. June 24, 2026.

Hubbell B. Building an Evidence Based Adaptation Future. 51st Annual Natural Hazards Workshop. Broomfield, CO. June 14, 2026.

Hubbell B. Panel presentation: Global Climate Resilience Policy in a Multipolar World. Institute of International Finance Climate Resilience Roundtable. Boston, MA. June 11, 2026.

Hubbell B. Building a Climate Adaptation and Resilience Evidence to Practice Infrastructure. National Adaptation Forum, Pittsburgh, PA. May 13, 2026.

Hubbell B. A Challenging Future for Climate and Air Quality? Western States Air Resources Council – Western Regional Air Partnership 2026 Spring Business Meeting. Denver, CO. April 8, 2026.

Hubbell B. ORD research and opportunities. NC State Center for Environmental and Resource Economic Policy. November 1, 2024

Hubbell B. ORD research updates. AAPCA Fall Business Meeting. August 30, 2024.

Hubbell B. Climate and Health. Association of State and Tribal Health Organizations Fall Policy & Issues Forum. October 24, 2023.

Hubbell B. Research to advance EPA's mission under a changing climate. Virginia Commonwealth University Symposium on Sustainable Energy and Environment. April 28, 2023.

Hubbell B. Wildland fire research to protect health and the environment. EPA Tools and Resources Webinar Series. March 15, 2023.

Hubbell B. Economic evaluation of chemical risk management programs. Health Canada Expert Workshop on Building the Public Health Approach to Chemical Management: From Knowledge to Action. February 7-8, 2023.

Hubbell, B. Presentation on Climate Change and Human Health Research, International Society of Environmental Epidemiology Annual Meeting, September 20, 2022.

Hubbell, B. Testimony to House Science, Space, and Technology committee on Assessing Federal Programs for Measuring Greenhouse Gas Sources and Sinks, June 2022.

Hubbell, B. Briefing for staff of House Science, Space, and Technology committee on Nature-Based Infrastructure Research, February 2022.

Hubbell, B. Presentation on Integrating Social and Natural Sciences to Inform Climate Solutions at the Division of Behavioral and Social Sciences and Education (DBASSE) Advisory Committee Fall Meeting, October 2021.

Hubbell, B. Panel discussion on Evidence-to-policy Translation, White House Office of Science and Technology Policy, November 2021.

Hubbell, B. Presentation on ORD Perspectives and Priorities on Climate Change. Division of Behavioral and Social Sciences and Education (DBASSE) Executive Session, December, 2021.

Hubbell, B. Presentation on ACE research activities at the WESTAR/WRAP 2021 Fall Business Meeting, December 2021.

Hubbell, B. Remarks to the NAS Workshop on Assessment and Advancement of Science in the Bureau of Ocean Energy Management Environmental Studies Program. June 2021.

Hubbell, B. Organizer and moderator, American Thoracic Society Annual Conference session on "The Intersection between Air Quality and COVID-19 Disease" May, 2021

Hubbell, B. Moderator, American Thoracic Society workshop on Social Cost of Carbon heat damage functions, cardiovascular endpoints breakout group. May, 2021

Hubbell, B. Presentation on ACE Wildland Fire Research for staff of House Committee on Science, Space, and Technology. April 2021.

Hubbell, B. Presentation on "Working with Tribal Partners: Indoor Air Exposures During Smoke Events" for EPA Tribal Science Council, December 2020

Hubbell, B. Presentation on ACE Wildland Fire Research for Council of State Governments Annual Conference. November 2020.

Hubbell, B. Presentation on ACE program activities for Association of Air Pollution Control Agencies. October 2020.

Hano, M,C. Baghdikian, B. Stearns, M. Linnenbrink,A. Brown, B. Hubbell, D. Diaz-Sanchez and W. Cascio. 2018. Advancing public participation in scientific research: A framework for leveraging public participation in environmental health and emergency response research. American Society for Public Administration Annual Meeting. March 9-13.

Hubbell B. 2018. Interdisciplinary and Translational Science at ORD. ACE Centers Annual Meeting, RTP, NC, June 21.

Hubbell B. 2018. For What It's Worth: Why and How We Put a Dollar Value on Clean Air. Keynote Presentation, NC Breathe 2018 conference. Winston-Salem, NC, March 7.

Hubbell B. 2016. OAQPS Perspectives on the ACE Centers. ACE Centers Kick-off Meeting, RTP, NC, September 15.

Hubbell B. 2016. What do Policy Makers and Risk Assessors Need to Know about Adverse Air Pollution Effects at Low Levels of Exposure? Presentation at the Health Effects Institute Annual Conference, May 1-3, 2016.

Hubbell B, Koerber M. 2015. OAQPS Update on Multi-pollutant Science and Policy Considerations. Webinar hosted by the Air and Waste Management Association. September 30.

Hubbell B. 2015. Perspectives on Future Directions in Air Quality Research Relevant to the Electricity Sector. Presentation for the ENV-Vision Conference (sponsored by the Electric

Power Research Institute and the Air and Waste Management Association), Crystal City, VA, May 12.

Hubbell B. 2014. O3 Welfare Effects and the W126 Metric. Presentation for the Joint Fall Meeting of the Ozone Transport Commission and MANE-VU. November 19.

Hubbell B. 2014. Clean Air Research Centers Annual Meeting Summary Remarks. Atlanta, GA, September.

Hubbell B. 2014. What do Policy Makers and Risk Assessors Need to Know about Adverse Air Pollution Effects at Low Levels of Exposure? Presentation to the Health Effects Institute Workshop on the HEI initiative to assess adverse effects of exposure to low levels of air pollution. June 30.

HH Shin, A Cohen, CA Pope III, M Ezzati, SS Lim, B Hubbell, RT Burnett. 2013. Critical issues in combining disparate sources of information to estimate the global burden of disease attributable to ambient fine particulate matter exposure. Methods for Research Synthesis: A Cross-Disciplinary Workshop. Harvard University, October 3.

Hubbell B. 2012. Closing Thoughts on Dynamic AQ Management and Adapting AQ Management to the Challenges of a Changing Climate. EPA STAR Dynamic Air Quality Management Grant Kickoff and Air Quality & Adaptation Grant Progress Review. RTP, NC, November 8-9.

Hubbell B. 2011. Exposure Modeling to Support Air Pollution Regulatory Programs. Presentation to the NAS Committee on Human and Environmental Exposure Science in the 21st Century. February.

Hubbell B. 2010. Valuing Health Benefits of Air Pollution Reduction Polices: A Case Study of Asthma Related Impacts. Presentation for 2010 Summit: America's Healthcare Policy through the Lens of Environmental Health. September 28.

Hubbell, B.J. 2010. Regulatory and Policy Implications of the Air Pollution to Health Research Paradigm: A U.S. EPA Perspective. Air Pollution and Health: Presented by the American Association for Aerosol Research. San Diego, CA. March 22-26.

Rea, Anne W., Christine C. Davis, Randall G. Waite, Ginger M. Tennant, Jason A. Lynch, Bryan J. Hubbell, Wayne R. Munns Jr., and George L. Van Houtven. 2009. Ecosystem services: Bridging the gap between science and policy in the National Ambient Air Quality Standard setting process. The 94th ESA Annual Meeting (August 2 - 7, 2009) Albuquerque, NM.

Hubbell. B. Air Quality Policy in the U.S. Keynote Address. EnviroCities 2008 International Conference: Sources and Health Effects of Air Pollution: Knowledge to Practice. Dubai, United Arab Emirates, November 11-13, 2008.

Hubbell. B. Science and Policy Analysis in the Setting of US EPA Air Quality Standards. EnviroCities 2008 International Conference: Sources and Health Effects of Air Pollution: Knowledge to Practice. Dubai, United Arab Emirates, November 11-13, 2008.

Hubbell, B. Defining Policy-Relevant Research Questions: A US Perspective. ISEE/ISEA Panel on Creating a Better Science-Policy Interface: Practical Guidelines for Scientists and Research Organizations. International Society for Environmental Epidemiology Annual Meeting, October, 2008.

Hubbell, B. Cost-Benefit Analysis for Air Pollution Policies. Workshop on Transportation Systems Impacts in the USA and Portugal. LUSO-AMERICAN FOUNDATION (FLAD) - Rua do Sacramento à Lapa 21, Lisboa. March 6, 2008.

Hubbell, B. and N. Fann. Methodological Considerations in Developing Local Scale Health Impact Estimates Using National/Regional Data. U.S. EPA/CDC/Health Effects InstituteWorkshop on Methodologic Issues in Environmental Public Health Tracking of Air Pollution Effects. Baltimore, MD, January 15-16, 2007.

Conner L, Richmond H, Hubbell B, Hetes B, Walker K, Roman H, Kinney P, Gettleman T Expert elicitation of estimated reductions in mortality associated with lower ambient fine particulate matter levels. Society for Risk Analysis Annual Meeting, Palm Springs, CA, December 2006

Phillips, S., B. Hubbell, C. Jang, P. Dolwick, N. Possiel, and T. Fox. CMAQ Multi-Pollutant Response Surface Modeling: Applications of an Innovative Policy Support Tool. 2006 Community Modeling and Analysis System Conference. RTP, NC, October, 2006.

Hubbell, B., T. Fox, P. Dolwick, and D. Mooney. A case study in the role of air quality models in regulatory development: Creation of an response surface model for ozone over the eastern United States. NOAA/EPA Golden Jubilee Symposium on Air Quality Modeling and Its Applications. RTP, NC, September, 2005.

Hubbell, B., P. Dolwick, D. Mooney, and M. Morara. Evaluating the Relative Effectiveness of Ozone Precursor Controls: Design of Computer Experiments Applied to the Comprehensive Air Quality Method with Extensions (CAMX). Air Quality V Conference, Arlington, VA, 2005.

Loughlin, D., G. Kleiman, B. Hubbell, and D. Weatherhead. Supporting Long-Term Regional Air Quality Management in Response to Global Change. U.S. Climate Change Science Program Workshop: Climate Science in Support of Decisionmaking. Arlington, VA, November 14-16, 2005.

Hubbell, B. Response Surface Metamodeling for Ozone and PM2.5. 3rd PM/RH/O3 Modeling Workshop. New Orleans, LA, May, 2005.

Interpretation and Application of Expert Judgments in Assessing Benefits of Reducing PM-related Mortality. L. Conner, B.J. Hubbell, K. Walker, H. Richmond, H. Roman. Society For Risk Analysis Annual Meeting, Palm Springs, CA, December 2004.

Walker, K.D., H.A. Roman, L. Conner, B. Hubbell, H. Richmond. An Expert Judgment Assessment of the Concentration-Response Relationship Between PM2.5 Exposure and Mortality. Society For Risk Analysis Annual Meeting, Palm Springs, CA, December 2004.

Dickie, M. and B. Hubbell. Family Resource Allocation and the Distribution of Health Benefits of Air Pollution Control. Association of Environmental and Resource Economists 2004 Workshop, "Distributional Effects of Environmental Policy." Estes Park, Colorado, June, 2004.

Hubbell, B., A. Hallberg, and D. McCubbin. Estimating Health Impacts of Urban PM2.5 Reductions with the Environmental Benefits Mapping and Analysis Program (BenMAP). Annual Meeting of the International Society of Environmental Epidemiology, New York City, NY, August, 2004.

Hubbell, B., T. Koman, T. Fox, N. Possiel, Z. Pekar, D. McCubbin, K. Davidson, and A. Hallberg. Health-related Benefits of Reducing Particulate Air Pollution from Nonroad Diesel Engines. Annual Meeting of the International Society of Environmental Epidemiology, New York City, NY, August, 2004.

Hubbell, B. Comparisons of QALY and WTP Approaches to Analyzing Air Pollution Regulations. Invited Paper, Resources for the Future Conference, Valuing Health Outcomes: An Assessment of Approaches, Washington D.C., Feb 13-14, 2003.

Hubbell, B. Invited Panel Participant, Economic Research Needs for Environmental Policy. 2nd World Congress of Environmental and Resource Economists. Monterey, CA, June 2002.

Kochi, I., B. Hubbell, and R. Kramer. An Empirical Bayes Approach to Combining and Comparing Estimates of the Value of a Statistical Life for Environmental Policy Analysis. 2nd World Congress of Environmental and Resource Economists. Monterey, CA, June 2002.

Mansfield, C., T. Wilcosky, and B. Hubbell. The Cost of Asthma: Cost of Illness Estimates of Acute Asthma Episodes. 2nd World Congress of Environmental and Resource Economists. Monterey, CA, June 2002.

Hubbell, B. QALYs in Analyses of Air Pollution Regulations. Invited Paper, University of Central Florida Workshop on Economic Valuation of Health for Environmental Policy: Assessing Alternative Approaches. Orlando, FL, March 2002.

Welsh, R., B. Hubbell, and C. Carpentier. Agro-Food System Restructuring and the Geographic Concentration of the U.S. Swine Industry. 65th Annual Meeting of the Rural Sociological Society, Chicago, IL, August 2002.

Kochi, I., R. Kramer, and B. Hubbell. An Empirical Bayes Approach to Combining Estimates of the Value of a Statistical Life for Environmental Policy Analysis. Invited paper, US EPA Workshop on Economic Valuation of Mortality Risk Reduction: Assessing the State of the Art for Policy Applications. Silver Spring, MD, November 2001.

Hubbell, B. Summary of Findings from the UN/ECE Symposium on The Measurement and Economic Valuation of Health Effects of Air Pollution. Invited Speaker, International Expert Workshop on the Integration of Health Effects, Energy and Economic Valuation, Garmisch-Partenkirchen, Germany. September, 2001.

Hubbell, B. The Importance of Source, Fate, and Transport in Air Pollution Benefits Transfer. Benefit Transfer: Practical Economic Analysis for Policy. Research Triangle Park, N.C., February, 2001.

Hubbell, B. Evaluating the Health Benefits of Air Pollution Reductions: Recent Developments at the U.S. EPA. Invited keynote paper, presented at the UK DETR/UN ECE Symposium on The Measurement and Economic Valuation of Health Effects of Air Pollution. London, Institute of Materials, February 19-20, 2001

Koman, T., B. Hubbell, J. Laurence, B. Heninger, A. Petro, J. Mills, and R. Haynes. Integrated Forestry Ozone Regulatory Modeling System (InFORMS): Economic Benefits of Reduced Ozone Damage to Eastern US Forests Resulting from US EPA's Heavy Duty Engine/Diesel Fuel Final Rule. Presented at the Future Directions in Air Quality Research Conference, NC State University, February, 2001.

Hubbell, B., S. Larsen, and L. Chappell. Valuing Reductions in Particulate Deposition on Household Surfaces Using Expenditures on Household Cleaning and Maintenance. (with Shannon Larsen and Linda Chappell). Camp Resources 2000. Wilmington, N.C. August, 2000.

Carlson, G.A., B.J. Hubbell, and M.C. Marra. "Demand for New, Transgenic Technology Bt Cotton Using Actual and Contingent Prices." Annual Meeting of the North Central Research Committee (NC-208), Tucson, AZ, 1999.

Marra, M.C., B.J. Hubbell and G.A. Carlson. "Information Quality and Technology Adoption: The Case of Bt Cotton Adoption in the Southeast," presented at the annual meeting of SRIEG 70, Gulf Shores, AL, March, 1999.

Marra, M.C., B.J. Hubbell, and G.A. Carlson. "Estimating the Demand for a New Technology: Bt Cotton and Insecticide Policies." Meeting of the International Consortium on Agricultural Biotechnology Research, Rome, Italy, 1999.

Welsh, R. and B.J. Hubbell. "Structural Change in the Pork Industry: Some Environmental Implications." Annual Meeting of the American Association for the Advancement of Science, Anaheim, CA, 1999.

Abrahams, N.A., B.J. Hubbell, and J. Jordan. “Averting Expenditures as a Measure of WTP in the Presence of Joint Production.” Annual Meeting of the American Association of Agricultural Economics, Nashville, TN, 1999.

Carlson, G.A., M.C. Marra and B.J. Hubbell. "Property Rights Issues with Transgenic Crops," Conference on Intellectual Property Rights, Mexico City, April, 1998.

Abrahams, N.A. and B.J. Hubbell. “Income Reminders and Willingness to Pay Estimates: Further Evidence.” Presented at Camp Resources 1998, Wilmington, NC, 1998.

W.J. Florkowski, Hubbell, B.J., R. Oetting, S. Braman, and C. Robacker. “Implications of Lawn Care and Landscape Maintenance Firm Profiles for Adoption of Pest Management Practices.” Presented as a selected paper at the Southern Agricultural Economics Association annual meetings in Little Rock, Arkansas, 1998.

Hubbell, B.J. and J.L. Jordan. “Joint Production and Averting Expenditure Measures of WTP: Do Bottled Water Expenditures Really Measure Avoidance Costs?” Presented as a selected paper at the Southern Agricultural Economics Association annual meetings in Little Rock, Arkansas, 1998.

Marra, M., B.J. Hubbell, and G.A. Carlson. Hubbell, B.J., G.A. Carlson, and M. Marra. “Combining Contingent and Actual Data in Evaluating Adoption of Bt Cotton in the Southeast.” Presented as a selected paper at the Southern Agricultural Economics Association annual meetings in Little Rock, Arkansas, 1998.

Marra, M.C., G.A. Carlson, and Bryan Hubbell. "Yield, Pesticide Use Changes and Profit from Bt Cotton Adoption." Selected paper presentation at the Beltwide Cotton Conference, San Diego, CA, January, 1998.

Hubbell, B.J. and R. Welsh. “Market Structure and Hog Manure Management in the Southern U.S.: Results of a Survey.” Presented as a selected paper at the Rural Sociological Society annual meetings in Toronto, Canada, 1997.

Hubbell, B.J. and R. Welsh “Entropy Based Measurement of Geographic Concentration in U.S. Hog Production.” Presented as a selected paper at the American Agricultural Economics Association annual meetings in Toronto, Canada, 1997.

Carlson, G.A., M. Marra, and B.J. Hubbell. “The Economics of Biotechnology: A National Perspective.” Invited panel presentation, 13th International Conference of Agricultural Economists in Sacramento, CA, 1997.

Carlson, G.A., M. Marra, and B.J. Hubbell. “Economics Implications of the Transgenic Crops.” Symposium presentation at the American Agricultural Economics Association annual meeting in Toronto, Canada, 1997.

Welsh, R. and B.J. Hubbell. “Hog Contracting and Manure Management in the South and Southeast.” Presented as a selected poster at the American Agricultural Economics Association annual meeting in Toronto, Canada, 1997.

Deodhar, S.Y., B.J. Hubbell, S.M. Fletcher, and S.K. Misra. “Imperfect Information and Consumer Responses to Pesticide Residue Risks.” Presented as a selected paper at the American Agricultural Economics Association annual meeting in Toronto, Canada, 1997.

Hubbell, B. J., W. J. Florkowski, R. Oetting, and S. K. Braman. “Pest Management in the Landscape/Lawn Maintenance Industry: A Factor Analysis.” Presented as a selected paper at the Southern Agricultural Economics Association Annual Meeting, Birmingham, AL, 1997.

Deodhar, S. Y., S. M. Fletcher, B. J. Hubbell, and S. K. Misra. “Effects of Information on Pesticide Residue Concerns: Implications for Food Safety Policy.” Presented as a selected paper at the American Council of Consumer Interests Annual Meeting, 1997.

Hubbell, B. J., S. M. Fletcher, and S. Y. Deodhar. “Impacts of the FAIR Act on Allocation of Peanut Quota in Georgia Counties.” Presented as a selected poster at the Southern Agricultural Economics Association Annual Meeting, Birmingham, AL, 1997.

Hubbell, B. J. and G. A. Carlson. “Environmental Hazards, IPM, and Insecticide Selection: An Analysis of U.S. Apple Growers.” Refereed selected paper, American Agricultural Economics Association Annual Meeting, San Antonio, TX, 1996.

Hubbell, B. J. and R. Welsh. 1996. “Issues in Benefits Measurement for Transgenic Crops in Sustainable Agriculture.” Invited paper, International Conference: *Managing Sustainability From the Ground Up*, Island of Vilm, Germany, 1996.

Hubbell, B. J. and G. A. Carlson. “Insecticide Selection and Rates Per Application: IPM is More than Total Use Reduction.” selected paper, Third Annual National IPM Symposium/Workshop, Washington, D.C., 1996.

Hubbell, B. J. “A Geometric Estimator for Modeling Observed Insecticide Application Frequencies.” selected paper, Southern Agricultural Economics Association Annual Meeting, Greensboro, NC, 1996.

Deodhar, S. Y., S. M. Fletcher, B. J. Hubbell, and S. K. Misra. “Willingness to Accept Higher Food Prices for Pesticide Residue Safety: Ambiguity or No Ambiguity, That is Also the Question.” Selected paper presented at Food Distribution Research Society Annual Meeting, New Orleans, LA, 1996.

Hubbell, B. J. and G. A. Carlson. "Per Acre Use of Fruit Insecticides When Quantity/Quality Tradeoffs Are Possible." selected paper, American Agricultural Economics Association Annual Meeting, San Diego, CA, 1994.

Carlson, G. A. and B. J. Hubbell. "Can Safety, Production, and Regulatory Characteristics Explain Use Of Pesticides?" Western Economic Association Annual Meeting, Lake Tahoe, NV, 1993.

Hubbell, B. J. and G. A. Carlson. "Fruit Quality and Pesticide Characteristics." Poster Presentation, Farm Foundation *Conference on Pesticide Use and Produce Quality*, Washington, D.C., 1993.

D. Recognition, Awards and Honors:

Silver Medal for Superior Service, Wildland Fires Team, 2018. "For prescient research on wildfire smoke, and for constructive tools used by public health officials, health care providers, and the public to protect human health"

Bronze Medal for Commendable Service, 2018. "In recognition of exemplary performance in the development of the primary NO2 National Ambient Air Quality Standard"

Bronze Medal for Commendable Service, 2018. "For the development of high-quality technical materials that informed the Science Advisory Board panel on the role of economy-wide modeling in EPA rulemakings

Administrator's Award for Excellence, 2015. Clean Power Plan.

Bronze Medal for Commendable Service, 2015. "For outstanding achievement in preparing the U.S. Solicitor General to defend the Agency's 'appropriate and necessary' finding for the Mercury and Air Toxics Standards"

Bronze Medal for Commendable Service, 2015. "For significant contributions to the protection of public health and welfare in the United States through the development of the Agency's NAAQS for ozone"

Bronze Medal for Commendable Service, Regional Climate Change-Air Quality-Human Health Interactions Team "For scientific leadership in developing modeling techniques and data to quantify the impacts of regional climate change and air quality on human health."

Scientific and Technological Achievement Award, Level I, 2014. (for the publications "Estimating the National Public Health Burden Associated with Exposure to Ambient PM2.5 and Ozone, Risk Analysis, 32(1):81-95 (2011) and The Recent and Future Health Burden of Air Pollution Apportioned Across U.S. Sectors, Environmental Science and Technology, 47(8):3580-3589 (2013))

OAQPS Director's Award for Leadership and Collaboration, 2014. For contributions to the Ozone REA Innovations Team.

EPA Science Achievement Award for Environmental Economics, 2014.

Bronze Medal for Commendable Service, 2014. "In recognition of exemplary performance in responding to Congressional requests for access to health study data"

EPA Science Achievement Award for Biology/Ecology, 2012. ("For the development of the Aquatic Acidification Index, the first ecologically relevant multi-pollutant indicator for secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Sulfur")

Scientific and Technological Achievement Award, Level II, 2012. (for the publication "A Multi-Pollutant, Risk-Based Approach to Air Quality Management: Case Study for Detroit" *Atmospheric Pollution Research* 1 (2010) 296-304.)

Bronze Medal for Commendable Service, 2008. Innovations in Air Pollution Epidemiology Team "For charting new directions by bringing together health, exposure, and atmospheric science communities to stimulate innovative epidemiological research"

Administrator's Award for Excellence, 2006. (Economic Analysis Tool Development Team)

Scientific and Technological Achievement Award, Level I, 2005. (for the publication "Health Related Benefits of Attaining the Eight-hour Ozone Standard" *Environmental Health Perspectives*, 113(2005): 73-82.)

EPA Science Achievement Award for Air Quality, 2005. ("for exceptional contributions to the development and application of state-of-the-art multidisciplinary models for calculating health and environmental benefits of changes in air quality")

Gold Medal for Exceptional Service, U.S. Environmental Protection Agency, 2005. (Nonroad Diesel Rule)

Silver Medal for Superior Service, "for innovative thinking and dedication in developing and applying new analytic techniques and tools to demonstrate cost and benefits of environmental regulations," U.S. Environmental Protection Agency 2004.

Individual Bronze Medal for Commendable Service, "for outstanding accomplishments in the advancement of the science of benefits analysis and its use in environmental regulatory policy.", U.S. Environmental Protection Agency 2001.

Gold Medal for Exceptional Service, U.S. Environmental Protection Agency, 2001. (Tier 2)

Special Achievement Award, U.S. Environmental Protection Agency, 2000.

Gold Medal for Exceptional Service, U.S. Environmental Protection Agency, 1999. (NOx SIP Call)