

V I T A E
October 2013

Personal Data:

Name: John T. Tschirhart

Born: New York, New York

Address: Department of Economics and Finance, 3985
University of Wyoming
Laramie, WY 82071

Express Contact: Phone: Office: (307) 766-2356, 2178
Home: (970) 498-9876
Fax: (307) 766-5090
email: jtsch@uwyo.edu or cheerheart@msn.com

Education:

B.S., Johns Hopkins University, 1970 (Mathematics);
M.S., Purdue University, 1973 (Economics);
Ph.D., Purdue University, 1975 (Economics)
Dissertation: A Game-Theoretic Approach to Pricing
in Decreasing Cost Industries
Advisor: Andrew B. Whinston

Academic Positions:

2001 (Spring)	Honorary Visiting Professor, Environmental Department, University of York, England
2000-2001	Visiting Mikesell Professor of Environment and Natural Resources, University of Oregon
1985-Present	Professor of Economics, University of Wyoming
1985 (Autumn)	Teaching Fellow, Australian National University
1983-1985	Burlington Northern Professor of Law and Economics, University of Wyoming
1980-1985	Associate Professor of Economics, University of Wyoming
1978-1980	Assistant Professor of Economics, University of Wyoming
1975-1978	Assistant Professor of Environmental Analysis and Policy, State University of New York at Buffalo

1971-1975 Graduate Instructor, Purdue University

Research Positions:

- 2003- 2012 Member of the Scientific Committee of DIVESITAS, An International Programme of Biodiversity Science, Paris, France
- 2003- Editorial Advisory Board, *International Journal of Environmental Science and Technology*
- 1997-2000 Member of the National Regulatory Research Institute Research Advisory Board, Ohio State University
- 1990-1991 Chairman, Transportation and Public Utility Group of the American Economic Association
- 1989-1990 Vice-Chairman, Transportation and Public Utility Group of the American Economic Association

Administrative Positions:

- 1988-2004 Director, Public Utility Research and Training Institute (PURTI), University of Wyoming
- 1982-1985 Chairman, Department of Economics, University of Wyoming
- 1980-1982 Director of Graduate Studies, Department of Economics, University of Wyoming

Courses Taught:

SUNY Buffalo: Undergraduate: Introduction to Statistical Reasoning; Managerial Economics;

Graduate: Government Regulation

U. Wyoming: Econ undergraduate: Macrofinance; Mathematical Economics; Industrial Organization; Intermediate Microeconomics; Intermediate Macroeconomics; Environmental Economics; Natural Resource Economics; Global Economic Issues; Ecosystems and Economics

Econ Graduate: Advanced Microeconomics; Seminar in Regulation; Economics of the Firm; MBA Microeconomics (Compressed Video); Environmental Economics; Economics for Env./Natural Resources

University of Wyoming Distinguished Graduate Faculty Mentor Award (2004)

UW ENR: Economics for Env./Natural Resources

UW Law School: Regulated Industries

U. Southern Denmark: Graduate: Economics of Marine Resources:
Ecological-Economic Modeling of the
Marine Environment, Center for
Fisheries and Aquaculture Management and
Economics (FAME), Denmark,
January 2011.

Australian National U.: Topics in Advanced Economics (1985)

Corporations & Regulatory Commissions: Public Utility Economics;
Public Utilities and the Environment

Publications:

Editor: *PURTI Research Summaries*, March 1989 - 1997

Books: *Natural Monopoly Regulation: Principles and Practice*, (with Sanford Berg),
Cambridge University Press, New York, New York, 1988.

*Protecting Endangered Species in the United States: Biological Needs, Political
Realities, and Economic Choices*, edited with Jason Shogren, Cambridge
University Press, New York, NY, 2001.

Refereed Journal Articles:

"A Game Theoretic Approach to Peak-Load Pricing," (with John Sorenson and Andrew
Whinston), *Bell Journal of Economics*, Autumn 1976, 497-520.

"The Use of Core-Theory in Joint Cost Allocation," (with Susan Hamlen and William
Hamlen). *Accounting Review*, Vol. 52, No. 3, July 1977, 616-27.

"A Theory of Pricing Under Decreasing Costs," (with John Sorenson and Andrew
Whinston), *American Economic Review*, Vol. 68, No. 4, September 1978, 614-24.

"Private Good Clubs and the Core," (with John Sorenson and Andrew Whinston),
Journal of Public Economics, Vol. 10, 1978, 77-95.

"Geometric Brownian Distribution of Solar Radiation with an Economic Application,"
(with Susan Hamlen and William Hamlen), *Solar Energy*, Vol. 21, 1978, 469-75.

- "Cost Allocation for a Regional Wastewater Treatment System: Theory and Application," (with Edna Loehman, Joseph Orlando and Andrew Whinston), *Water Resources Research*, Vol. 15, April 1979, 193-202.
- "Behavior of a Monopoly Offering Interruptible Service," (with Frank Jen), *Bell Journal of Economics*, Vol. 10, No. 1, Spring 1979, 244-58.
 • **(Reprinted in *The Economics of Public Utilities*, 2006, ed. Ray Rees, The International Library of Critical Writings in Economics, Series Editor: Mark Blaug)**
- "The Use of the Generalized Shapley Allocation in Joint Cost Allocation," (with Susan and William Hamlen), *Accounting Review*, Vol. 55, No. 2, April 1980, 269-87.
- "The Economic Theory of Clubs: An Evaluative Survey," (with Todd Sandler), *Journal of Economic Literature*, Vol. 18, No. 4, December 1980, 1481-1521.
- "Solar Energy, Public Utilities, and Economic Efficiency," (with William Hamlen), *Southern Economic Journal*, Vol. 47, No. 2, October 1980, 348-65.
- "On Public Utility Pricing under Stochastic Demand," *Scottish Journal of Political Economy*, Vol. 27, No. 3, November 1980, 216-234.
- "On the Number and Membership Size of Consumer-Managed Firms," (with Todd Sandler), *Southern Economic Journal*, Vol. 47, No. 4, April 1981, 1086-91.
- "Toward a Unified Theory of Nonmarket Institutional Structures," (with Todd Sandler and Jon Cauley), *Australian Economic Papers*, June 1983, 233-54.
- "Power Pooling: An Exercise in Industrial Coordination," (with Curtis Cramer), *Land Economics*, Vol. 59, No. 1, February 1983, 24-34.
 • **(Reprinted in *Electric Ratemaking*, vol. 2, April-May 1983, 28-36.)**
- "A Theoretical Analysis of Transnational Terrorism," (with Todd Sandler and Jon Cauley), *American Political Science Review*, Vol. 77, No. 1, March 1983, 36-54.
 • **(Reprinted in *The Economics of Conflict*, 2004, eds. T. Sandler and K. Hartley, Edward Elgar Publishing, Ltd.)**
 • **(Reprinted in *Terrorism, Volume II*, 2005, ed. Rosemary H. T. O'Kane, Edward Elgar Publishing, Ltd., Cheltenham, UK)**
 • **(Reprinted in *Transnational Terrorism*, 2013, ed. Steven M. Chermak and Joshua D. Freilich, Aldershot: Ashgate, pp. 347-365.)**
- "Mixed Clubs: Further Observations," (with Todd Sandler), *Journal of Public Economics*, Vol. 23, No. 3, April 1984, 381-390.
- "An Analysis of Interfirm Cooperation: Theory and Evidence From Electric Power Pools," (with Douglas Gegax), *Southern Economic Journal*, April 1984, 1077-1097.

- "A Test of the Expected Utility Model: Evidence from Earthquake Risks," (with David Brookshire, Mark Thayer, and William Schulze), *Journal of Political Economy*, v. 93, No. 2, April 1985, 369-389.
- (Reprinted in *Environmental Valuation*, 1999, ed. K. G. Willis, K. J. Button and P. Nijkamp, Edward Elgar, UK)
 - (Reprinted in *The Economics of Natural Hazards*, 2004, ed. Howard Kunreuther and Adam Rose, Edward Elgar, UK)
 - (Reprinted in *Classics in Risk Management*, ed. W. Kip Viscusi, John F. Cogan and Ted Gayer, Edward Elgar, UK)
- "Uncertainty and Clubs", (with Todd Sandler and Frederic P. Sterbenz), *Economica*, Vol. 52, Number 208, November 1985, 467-478.
- "Flexible Modelling of Time to Failure in Risky Careers," (with Scott E. Atkinson), *Review of Economics and Statistics*, Vol. 68, No. 4, November 1986, 558-566.
- "Terrorism in a Bargaining Framework," (with Scott E. Atkinson and Todd Sandler) *Journal of Law and Economics*, Vol. 30, No. 1, April 1987, 1-21.
- (Reprinted in *The Economics of Crime*, editors Isaac Ehrlich and Zhiqiang Liu, Univ. of Chicago Law School, 2005)
- "Benefits and Costs of Earthquake Resistant Buildings," (with William Schulze, David Brookshire and Ronda Hageman) *Southern Economic Journal*, Vol. 53, No. 4, April 1987, 934-951.
- "On the Economic Evaluation of Ecosystems," (with Thomas Crocker) *Transactions of the American Fisheries Society*, Vol. 116, June 1987, 469-478.
- "Revenue Sharing as an Incentive Mechanism in an Agency Problem: An Example from the National Football League," (with Scott E. Atkinson and Linda R. Stanley), *RAND Journal of Economics*, Vol. 19, No. 1, Spring 1988, 27-43.
- "Ranking Economics Departments in Areas of Expertise," *Journal of Economic Education*, Vol. 20, No. 2, Spring 1989, 199-222.
- "Industrial Cogeneration and Regulatory Policy," (with Paulette Barclay and Douglas Gegax), *Journal of Regulatory Economics*, Vol. 1, No. 3, September 1989, 225-240.
- "The Public Utility Regulatory Policy Act and Regulatory Behavior," (with Clifford Nowell), *Journal of Regulatory Economics*, Vol. 2, No. 1, March 1990, 21-36.
- "Hedonic Prices for a Nondurable Good: The Case of Breakfast Cereals," (with Linda R. Stanley), *Review of Economics and Statistics*, Vol. 73, August 1991, 537-541.
- "Entry into the Electric Utility Industry," *Journal of Regulatory Economics*, Vol. 3, No.1, March 1991, 27-44.

- "A Hedonic Price Analysis of Nutritionally Labeled Breakfast Cereals: Implications for Nutrition Labeling," (with Linda R. Stanley), *Journal of Nutrition Education*, Vol. 23, No. 5, September/October 1991, 231-238.
- "Ecosystems, Externalities and Economies," (with Thomas D. Crocker), *Environmental and Resource Economics*, 2, 1992, 551-567.
 • (Reprinted in *Global Aspects of the Environment*, 1999, R.U. Ayres, K.J. Burton, and P. Nijkamp, eds., Cheltenham, U.K.: Edward Elgar, pp. 123-139.)
- "Testing Theories of Regulatory Behavior," *Review of Industrial Organization*, (with Clifford Nowell), Volume 8, 1993, 653-668.
- "Multiproduct Clubs: Membership and Sustainability," (with Todd Sandler) *Public Finance*, v.48, #2, 1993, 153-70.
- "On the Use of Adders by Public Utility Commissions," *Energy Journal*, v. 15, #1, 1994, 121-128.
- "Contributions of Neoclassical Economics to Public Utility Analysis," (with Sanford Berg), *Land Economics*, v. 71, #3, August 1995, 310 - 330.
- "A Market Test for Natural Monopoly in Local Exchange," (with Sanford Berg), *Journal of Regulatory Economics*, v. 8, #2, September 1995, 103 - 124.
- "Incentives for Conservation in the Electric Utility Industry," *Pacific and Asian Journal of Energy*, v. 5, #2, December 1995, 175-186.
- "Natural Monopoly and Monopoly Power in the Energy Industry," *Resource and Energy Economics*, v. 17, 1995, 327-340.
- "Club Theory Thirty Years Later," (with Todd Sandler), *Public Choice*, v. 93, #3-4, 1997, 335-355.
- "Non Utility Power, Alternative Regulatory Regimes and Stranded Investment," (with Shioh-Ying Wen), *Journal of Regulatory Economics*, v. 12, November 1997, 289-308.
- "Separating Economic from Political Influences on Government Decisions," (with Lisa Crone), *Journal of Economic Behavior and Organization*, v. 35, #4, May 1998, 405-425.
- "Takings, Compensation and Endangered Species Protection on Private Lands," (with Robert Innes and Stephen Polasky), *Journal of Economic Perspectives*, 12, #3, Summer 1998, 35-52.
 • (Reprinted in *Environmental Economics: Critical Concepts*, 2007, Charles Mason and Erwin Bulte, eds., Routledge Press.)

- “Why Economics Matters for Endangered Species Protection and the ESA,” (with Jason Shogren, Terry Anderson, Amy Whritenour Ando, Steven Beissinger, David Brookshire, Gardner Brown, Don Coursey, Robert Innes, Stephen Meyer and Stephen Polasky) *Conservation Biology*, 13, December 1999, 1257-1261.
- “Green Accounting and the Welfare Gap,” (with Paul Turner) *Ecological Economics*, 30, 1999, 161-175 .
- “Tradable Allowances in a Restructuring Electric Industry,” (with Shioh-Ying Wen) *Journal of Environmental Economics and Management*, 38, #2, September 1999, 195-214.
- “The Endangered Species Act at 25,” (with Jason F. Shogren) *Choices*, Third Quarter 1999, 4-9.
 • **(Awarded Best Choices Article for 1999)**
- “General Equilibrium of an Ecosystem,” *Journal of Theoretical Biology*, 203, March 2000, 13-32.
- “Microfoundations of Population Dynamics,” (with Rüdiger Pethig) *Journal of Bioeconomics*, v. 3, # 1, 2002.
- “Resource Competition among Plants: From Maximizing Individuals to Community Structure,” *Ecological Modelling*, 148, 15 February 2002, 191-212.
- “Harvesting in an Eight Species Ecosystem,” (with David Finnoff) *Journal of Environmental Economics and Management*, May 2003, 45 (3), 589-611.
- “Protecting an Endangered Species while Harvesting its Prey in a General Equilibrium Ecosystem Model,” (with David Finnoff) *Land Economics*, May 2003, v. 79, 160-180.
 • **(Reprinted in *Ecological Economics*, 2009, Charles Perrings, ed., Sage Publications.)**
- “Ecological Transfers in Non-Human Communities Parallel Economic Markets in a General Equilibrium Ecosystem Model,” *Journal of Bioeconomics*, 2003, v. 5 (2 and 3), 193-214.
- “Measuring the Impact of Asymmetric Information: An Example from Energy Conservation,” (with Chad Settle) *Journal of Regulatory Economics*, 2003, v. 24(3), 329-357.
- “A New Adaptive System Approach to Predator-prey Modeling,” *Ecological Modelling*, 2004, 176 (3-4), 255-276.
- “Identifying, Preventing and Controlling Successful Invasive Plant Species Using Their Physiological Traits,” (with David Finnoff) *Ecological Economics*, February 2005, 52(3), 397-416.

- “Invasive Species and the Depth of Bioeconomic Integration,” (with David Finnoff, Chad Settle and Jason Shogren), *Choices*. 3rd Quarter, 2006: 21(3), 147-151.
- “Using Oligopoly Theory to Examine Individual Plant versus Community Optimization and Evolutionary Stable Objectives,” (with David Finnoff) *Natural Resource Modeling*, 2007, 20(1): 61-86.
- “Efficient Ecosystem Services and Naturalness in an Ecological/Economic Model,” (with Thomas Eichner). *Environmental and Resource Economics*, 2007, 37(4): 733-755.
- “Reconstructing Past Ecosystem Processes with General Equilibrium Models: House Mice in Kern County, California, 1926-27.” (with Seong-Hee Kim and Steven Buskirk). *Ecological Modelling*. 2007, 209:235-248.
- “Linking Dynamic Ecological and Economic General Equilibrium Models,” (with David Finnoff). *Resource and Energy Economics*, 2008, 30: 91-114.
- “A Bioeconomic Model of Cattle Stocking on Rangeland Threatened by Invasive Plants and Nitrogen Deposition,” (with David Finnoff and Aaron Strong). *American Journal of Agricultural Economics*, 2008, 90(4): 1074-1090.
- “Models Integrating Ecology and Economics,” *Annual Review of Resource Economics* October 2009, vol. 1: 381-409.
- “Plant Competition and Exclusion with Optimizing Individuals,” (with David Finnoff). *Journal of Theoretical Biology*, November 2009, 261(2): 227-237.
- “Optimal Harvest Licensing when Harvest Success is Uncertain,” (with Abul Maala Tanvir Hussain), *American Journal of Agricultural Economics*, 2010, 92(1): 125-140.
- “Ecosystem Services and the 2020 Targets,” (with C. Perrings, S. Naeem, F. Ahrestani, D.E. Bunker, P. Burkill, G. Canziani, T. Elmqvist, R. Ferrati, J. Fuhrman, F. Jaksic, Z. Kawabata, A. Kinzig, G.M. Mace, F. Milano, H. Mooney, A. Prieur Richard, W. Weisser), *Science*, 330, 15 October 2010: 323-324.
- “Restricted Capacity and Rent Dissipation in a Regulated Open Access Fishery,” (with Robert Deacon & David Finnoff). *Resource and Energy Economics*, 2011, v. 33(2): 366-380.
- “Is Economic Growth for the Birds?” (with Aaron Strong and David Finnoff), *Ecological Economics*, 2011. 70: 1375-1380.
- “Ecosystem Services, Targets and Indicators for the Conservation and Sustainable use of Biodiversity,” (with Charles Perrings, Shahid Naeem, Farshid S. Ahrestani, Daniel E. Bunker, Peter Burkill, Graciela Canziani, Thomas Elmqvist, Jed A. Fuhrman, Fabian M. Jaksic, Zen’ichiro Kawabata, Ann Kinzig, Georgina M.

Mace, Harold Mooney, Anne-Hélène Prieur-Richard, Wolfgang Weisser), *Frontiers in Ecology and the Environment*, 2011. 9(9): 512-520..

“Inserting Ecological Detail into Economic Analysis: Agricultural Nutrient Loading of an Estuary,” (with David Finnoff), *Sustainability*, 2011. 3(10), 1688-1722. Open access journal.

“Biology as a Source of Non-convexities in Ecological Production Functions,” *Environmental and Resource Economics*. 2012. 51(2): 189-213.
● **(Awarded Best Paper of the Year in *Environmental and Resource Economics*)**

“Perspectives on ecosystem based management for delivering ecosystem services with an example from an eighteen-species marine model.” (with David Finnoff and Min Gong), *International Review of Environmental and Resource Economics*. 2012. 6: 79 - 118.

“Economic/Ecological Tradeoffs among Ecosystem Services and Biodiversity Conservation,” (with Abul Maala Tanvir Hussain). *Ecological Economics*. 2013. 93: 116-127.

Book Chapters, Proceedings Papers and Book Reviews:

"National and International Energy Grids," (with C. Cramer), in *The Theory and Structures of International Political Economy*, edited by Todd Sandler, Westview Press, Boulder, Colorado, 1980, 215-34.

"An Economic Analysis of the Benefits and Costs of Seismic Building Codes," (with W. Schulze, D. Brookshire, and R. Hageman), in *Earthquakes and Earthquake Engineering - Eastern United States*, Vol. 2 (1981): Ann Arbor Science.

"An Economic Overview of the Issues and Problems in Microzonation," (with W. Schulze, D. Brookshire, R. Hageman, J. Murdoch and M. Thayer) *Third International Microzonation Conference Proceedings*, Volume I of III, March 1982.

"Transferable Discharge Permits and Profit Maximizing Behavior," Chapter 10 in *Proceedings in the American Chemical Society Symposium on Acid Rain*, April 1982 in Las Vegas, Ann Arbor Science Publications, Inc., Ann Arbor, Michigan.

"The Benefits and Costs of Seismic Building Codes," (with W. Schulze, D. Brookshire, and R. Hageman), in *Social and Economic Aspects of Earthquakes*, edited by Barclay G. Jones and Mihu Tomazeric, Program in Urban and Regional Studies, Cornell University, 1982, 187-204.

- "Economic Methods and the Study of Terrorism," (with Todd Sandler, et al.) in Paul Wilkinson (ed.), *Contemporary Research on Terrorism*, Aberdeen Scotland: University of Aberdeen Press, 1987, 376-89.
- "Partial Regulation of Natural Monopoly," in Jason Shogren (ed.), *Political Economy of Government Regulation*, 1989, Kluwer Academic Press, Norwell, Massachusetts, 55-82.
- "Natural Monopoly and the Justification for Regulation," (with S. Berg) in *Challenging the Regulatory Process*, 5th Annual Current Issues, Center for Public Utilities, New Mexico State University, March 1989, 150-7.
- "Incentive Regulation: An Academic Perspective," in *Incentive Regulation, 1992*, Management Exchange and Public Utility Reports, Washington, D.C., March 1992.
- "Environmental Regulation in an Industry with Price and Entry Regulation," (with Cale Case), Air & Waste Management Association, Denver, December 1993.
- "Marketing in the Environment: A Biophysical Perspective," (with Linda Stanley) 18th Macro Marketing Conference, *New Visions in a Time Transition*, August 1993.
- "Why Pay to Destroy the Environment," a book review of Norman Myers' *Perverse Subsidies*, Winnepeg, Canada in *Conservation Biology*, 13, February 1999.
- "Environmental Issues in a Restructuring Electric Industry," *Private Initiatives in Infrastructure: Priorities, Incentives and Performance*, eds., M. Tsuji, S. Berg and M. Pollitt, Institute of Developing Economies, Japan External Trade Organization, Chiba, Japan, 2000.
- "Domestic and International Environmental Issues in Restructuring Electric Industries," in *Private Initiatives in Infrastructure: Priorities, Incentives and Performance*, eds., M. Tsuji, S. Berg and M. Pollitt, Cheltenham, U.K.: Elgar Press, 2002.
- "The Role of Private Information in Designing Conservation Incentives for Property Owners," (with Jason F. Shogren and Rodney B. W. Smith) in *Species at Risk: Economic Incentives to Protect Endangered Species on Private Property*, J. Shogren (ed.), Austin, Texas: University of Texas Press, 2004.
- "Introduction: Integrating Ecology and Economics to Address Bioinvasions," (with Jason F. Shogren), *Ecological Economics*, February 2005, 52(3), 267-271.
- "Modeling biodiversity and ecosystem services in coupled ecological-economic systems," (with Brock, W.A., D. Finnoff, A.P. Kinzig, U. Pascual, C. Perrings, J. Tschirhart, A. Xepapadeas (in press) In S. Naeem, D. Bunker, A. Hector, M. Loreau and C. Perrings (eds) *Biodiversity, Ecosystem Functioning, & Human Wellbeings*, Oxford: Oxford University Press, 2009.

“The Economics of Biodiversity and Ecosystem Services,” (with C. Perrings, S. Baumgärtner, W.A. Brock, M. Chopra, M. Conte, A. Duraiappah, A.P. Kinzig, U. Pascual, S. Polasky, A. Xepapadeas (in press) In S. Naeem, D. Bunker, A. Hector, M. Loreau and C. Perrings (eds) *Biodiversity, Ecosystem Functioning, & Human Wellbeings*, Oxford: Oxford University Press, 2009.

“Integrating Economics and Biology for Invasive Species Management,” (with D. Finnoff, C. Settle and J. Shogren). In Reuben P. Keller, David M. Lodge, Mark A. Lewis and Jason F. Shogren (eds.) *Bioeconomics of Invasive Species: Integrating Ecology, Economics, Policy and Management*, Oxford: Oxford University Press, 2009.

Grant Research Experience:

State University of New York Faculty Research Fellowship, Summer, 1976.

State University of New York Faculty Research Fellowship, Summer, 1977.

State University of New York at Buffalo, School of Management
Research Grant, 1977.

Investigator for **Los Alamos Scientific Laboratories** on Environmental Aspects of Solar Energy Deployment, Contract No. N28-8365H, 1979.

Investigator for **U.S. Geological Survey** on Methods Development for Assessing the Value of Hazards Information, Contract No. 14-04-0001-17524, 1979-80, \$149,351.

Investigator for **U.S. Environmental Protection Agency** for Methods Developed for Assessing Air Pollution Control Benefits (with an emphasis on Acid Precipitation), Contract No. R806972010, 1979-80, \$51,932.

Principal Investigator for **U.S. Environmental Protection Agency** Grant on Valuation of Ecosystems, Contract No. R808893010, 1981-83, \$101,190.

Principal Investigator for **Wyoming Public Service Commission** Grant on Benefits and Costs of Time-of-Day Electric Rates in Wyoming, Contract No. 0792981UWI, 1981, \$24,650.

Principal Investigator for **National Science Foundation** Grant on Measuring Industry Cost Structure and the Exercise of Monopoly Power, and a Department Improvement Plan for the University of Wyoming Economics Department, 1986-1990, \$253,813.

Investigator for **Wyoming Water Research Center** on Design and Analysis of Appropriate Economic Methods for Planning and Evaluating Wyoming Water Resource Development, 1989, \$65,000.

Investigator for **American Water Works Association** through Wyoming Water Research Center on Model Design for Evaluating Water Conservation Programs, 1995, \$30,000.

Instructor for **U.S. Information Agency** Exchange Program with Saratov State University, Saratov, Russia and Moscow Oil and Gas Academy, Moscow, Russia, 1995.

Investigator for **U.S. Environmental Protection Agency/EPSCoR** Grant on Integrating Ecological and Economic Modeling to Support Decision Making, 1997-99, \$989,000.

Principal Investigator for **UW International Program**, Travel Grant to visit Sweetwaters Game Reserve, Kenya, Title: An Ecosystem Model of an African Game Reserve, July 2000, \$2000.

Principal Investigator for **U.S. Forest Service** Grant on An Examination of Development Paths of Resource Abundant Regions, 2000-2001, \$25,000.

Principal Investigator for **U.S. Environmental Protection Agency** Grant on Predicting and Valuing Species Population Changes in an Ecosystem/Economic General Equilibrium Model, 2003-2005, \$203,000.

Investigator for **U.S. Economic Research Service/USDA** Grant on Integrating Economics and Biology for Bioeconomic Risk Assessment/Management of Invasive Species in Agriculture, 2004-2006, \$205,486.

Principal Investigator for **U.S. National Marine Fisheries Service** Grant on Developing an Integrated Regional Economic-Ecological Model of Alaska Fisheries. 2005. \$22,000.

Principal Investigator for **U.S. National Marine Fisheries Service** Grant on Further Developing an Integrated Regional Economic-Ecological Model of Alaska Fisheries. 2005-2007. \$45,000.

Principal Investigator for **Maryland Sea Grant** on Developing a Framework for the Use of Computable General Equilibrium Economic and Ecological Models for Fisheries Management in the Chesapeake Bay. 2012-2013 \$50,000.

CoPI on “An Economic/Ecological Analysis of Externalities Associated with Energy Development in Wyoming and the Intermountain West,” - The **Center for Energy Economics and Public Policy**, School of Energy Resources, UW. \$150,000.

Consulting:

Mathematica, Inc. (1975): Comparative Analysis of Cost Allocation Methods

Public Utility Research Center, U. of Florida (1980): Alternative Load Management Techniques.

Los Alamos Scientific Laboratories (1980-81): Consumer Acceptance of Electric Power Cogeneration.

Minnesota Pollution Control Agency (1981): Clean Air Quality Standards.

National Football League Players Association (1982-83): Salary Structures and Injuries.

Inman and Associates, Denver, CO, (1985): Natural Gas Antitrust Suit.

Mountain Bell (1985): A Survey of Consumer Attitudes Toward Deregulation Within the State of Wyoming.

Ameritech (1987): A Review of the Problems Inherent in Rate-of-Return Regulation of Natural Monopolies.

Electric Power Research Institute (1989): Dues Structures for Voluntary Organizations.

U S WEST, Denver, Colorado (1990, 1991, 1992): Course on the Economics of Public Utility Regulation.

Department of Energy, Energy Information Administration (1991): Report on Non-Utility Generation Supply Model.

Saskatchewan Telecommunications (1991): Report on designing a social incentive plan for regulation.

U S WEST, Portland, Oregon (1992): Course on the Economics of Public Utility Regulation.

State of Wyoming (1993): Cost allocation between mining and coal processing.

U S WEST, Seattle, Washington (1993): Course on the Economics of Public Utility Regulation.

The seven Regional Bell Operating Companies (1993-94): Are Local Exchange Companies Natural Monopolies?

United Nations Environmental Development Program (1996): Establishing an economics incentive program for solid waste disposal in the City of Almaty, Kazakhstan.

World Bank through Coopers and Lybrand (1996): Lecture and consult with federal government officials on the Regulation of Newly Privatized Public Utilities and on International Comparisons, La Paz, Bolivia, 1996.

World Bank/University of Florida/ (1997): Lecturer on environmental regulations at the International Training Program on Utility Regulation and Strategy, Gainesville, Florida, June 1997.

Kennedy & Christopher, Denver, Colorado (1999): Suit on PacifiCorp's lost profits owing to an electric generating plant accident.

Kennedy & Christopher, Denver, Colorado (2001): Testimony on the restructured electric industry in California.

Department of the Environment, Iran (2003): Presented a workshop on environmental and natural resource economics.

Research Seminars:

Appalachian State University (2)	University of California, Davis
Australian National University	University of California, Santa Barbara
Bell Laboratories	University of Florida (5)
California State University, Chico	University of Guelph, Canada
Cornell University	University of Oregon
Chesapeake Biological Laboratory (2)	University of Rhode Island
Colorado State University (3)	University of Siegen, Germany
Islamic Azad University, Iran	University of Minnesota
Iowa State University	University of Tampere, Finland
Los Alamos Scientific Laboratory	University of Texas, Dallas
New Mexico State University	University of York, England
Oregon State University (3)	US West, Denver
Weber State University	United States Forest Service
Scripps Institute of Oceanography	United States Geological Survey Palo Alto, California
SUNY at Buffalo (2)	United States EPA (2), Washington D.C.
Oak Ridge National Laboratory	University of Wyoming (numerous)

Natural Resource Ecology Lab. Colorado State University (2)	University of Maryland (2)
NOAA Fisheries, Washington D.C. (2)	Institute for Developing Economies, Japan
Alaska Fisheries Science Center, NOAA Fisheries, Seattle, Washington	California State University, Fullerton
University of Central Florida	Yale University

Public Utility Research and Training Institute (PURTI)

Curtis Cramer and I founded PURTI in 1988, and we were its co-directors. The purpose of PURTI was to advance our knowledge of public utility problems through research, and disseminate that knowledge through training and *PURTI Research Summaries*. We had a dozen corporate and government sponsors and our training courses included The Changing World of Public Utility Economics (August 1989, 1990, 1991, 1992), Externalities and Public Utilities (June 1992), and Public Utilities and the Environment (June 1993). The *Summaries*, currently discontinued, was published thrice annually and its objective was to make academic articles accessible to public utilities and utility commissions. Numerous utilities, academics, consulting firms and every state commission subscribed to the *Summaries*. PURTI complemented the Department of Economics program in regulatory economics where we had a 100% success rate placing our M.S. and Ph.D. students in career positions.

Selected Presentations:

"Consumption-Loan Models and the Family: An Economic Theory of Population," with Yoshihiko Otani and Andrew Whinston, presented at the World Econometric Society Meetings in Toronto, August 1975.

"The Use of Goal Programming in Allocating the Gains of Cooperation with Susan and William Hamlen, presented at the TIMS/ORSA meetings in Miami, November 1976.

"On Club Theory and the Core," with J. Sorenson and A. Whinston presented at the Southern Economic Association Meetings in New Orleans, November 1977.

"Geometric Brownian Distribution of Solar Radiation with an Econometric Application," with Susan and William Hamlen, presented at the Southern Economic Association Meetings, in Washington, D.C., November 1978.

- Discussant for "Nonprice Rationing and Market Price when Demand is Stochastic," by Roger Sherman and Michael Visscher at an NBER Conference in Mathematical Economics and Econometrics, U. of Virginia, May 1979.
- "Welfare Aspects of Interruptible Service," with Frank Jen presented at the Western Economic Meetings in Las Vegas, June 1979.
- "The Economic Theory of Clubs: An Evaluative Survey," with Todd Sandler presented at the Public Choice Society Meetings in San Francisco, March 1980.
- "Valuing Ecosystem Functions: The Effects of Acidification," with T. Crocker and R. Adams, presented at the American Economic Association Meetings in Denver, September 1980.
- Discussant for "Economic Efficiency and Automatic Fuel Adjustment Mechanisms" by John Stewart at Rutgers University Conference on Issues in Public Utility Pricing and Regulation, October 30, 1981.
- "Cooperation Among Electric Public Utilities: A Theory of Power Pooling," presented at the American Economic Association Meetings, Washington, D.C., 1981.
- Presided over a session "Club Theory and Applications," at the American Economic Association Meetings, Washington, D.C., 1981.
- "On Terrorism: Theoretical and Political Aspects," at the American Political Science Association Meetings, Chicago, 1983.
- "An Analysis of Interfirm Cooperation: Theory and Evidence from Electric Power Pools," at the American Economic Association Meetings, San Francisco, 1983.
- "Early Retirement from Risky Careers: Time to Failure in the NFL," at the Summer Econometric Society Meetings, Stanford University, Palo Alto, California, 1984.
- "Modelling Labor Force Retirements from Risky Careers," at the American Economic Association Meetings, Dallas, Texas, December 1984.
- "Bargaining and the Length of Terrorism Incidents," at the Public Choice Meetings, New Orleans, Louisiana, February 1985.
- "Impediments to Electric Power Pooling," at the TIMS/ORSA Meetings, Boston, Massachusetts, April 1985.
- "Consumer Response to Mandatory Information Disclosures: The Case of the Food Products Industry" (with L. Stanley) American Economic Association Meetings, New Orleans, December 1986.
- "Testing Competing Theories of Regulatory Behavior," (with Clifford Nowell) American Economic Association Meetings, New York, December 1988.

"Caveats in the Deregulation of Electricity," presented at the 6th Annual New Mexico State University Conference on Public Utilities, Santa Fe, NM, March 1990.

Discussant of "*The Logic of Collective Action* Twenty-Five Years Later: A Retrospective Look," by Todd Sandler. American Economic Association session in honor of Mancur Olson, Washington, DC, December 1990.

"Multiproduct Clubs: Membership and Sustainability," (with Todd Sandler) New Directions in the Theory of Clubs Conference, University of Tampere, Tampere, Finland, August 1991.

Organized and Chaired a session on "The Transforming Electric Utility Industry," at the American Economic Association meetings in New Orleans, January, 1992.

"Incentive Regulation: An Academic Perspective," presented at Management Exchange, Inc. Conference, March 1992, Washington, D.C.

"Environmental Costs" presented at Current Issues Challenging the Regulatory Process, Center for Public Utilities, Santa Fe, NM, March 1993.

"Environmental Regulation in an Industry with Price and Entry Regulation," presented at the Air and Waste Management Association Annual Meeting, Denver Colorado, June 1993.

"Natural Monopoly in Local Exchange," with S. Berg, presented at a PURTI Academic Seminar, Denver, CO., May 1994.

"Incentives for conservation in Electric Utilities," presented at the Western Economic Association Meetings, Vancouver, B.C., July 1994.

"Club Theory Thirty Years Later," presented at the American Economic Association Meetings, Washington, D.C., January 1995.

"Recycling and Consumer Behavior," (with Theresa DiVenti) presented at the European Association of Environmental and Natural Resource Economists, Lisbon, Portugal, June 1996.

"On Measuring Economic Development with Economic Growth," (with Paul Turner) presented at the Ecological Summit, International Association of Ecological Economics, Copenhagen, Denmark, August 1996.

"The Interaction of Environmental Regulation and Alternative Forms of Public Utility Regulation in Electric Utilities," (with Shioh-Ying Wen) Front Range Conference on Environmental and Resource Economics, Ft. Collins, Colorado, September 1996.

- “Non-Utility Power, Alternative Regulatory Forms and Stranded Investment,” (with Shioh-Ying Wen) American Economic Association Meetings, Chicago, January 1998.
- “Economic and Biological Sustainability in a Two-Region Endogenous Growth Model,” (with Paul Turner) First World Congress of Environmental Economists, Venice, Italy, June 1998.
- Discussant of papers by G. Rausser and A. Small and by A. Solow, S. Polasky and J. Camm at Valuing and Managing Ecosystems, U. S. Environmental Protection Agency, Washington, D. C., October 1998.
- “General Equilibrium of an Ecosystem,” Pacific Northwest Conference on Environmental & Resource Economics, University of Oregon, May 1999.
- “Gauging the Impact of Asymmetric Information: An Example from Demand Side Management,” (with Chad Settle) American Economic Association Meetings, Boston, January 2000.
- “Regulating Fisheries in a Complex Ecosystem,” (with David Finnoff) AERE workshop on Effectiveness of Resource and Environmental Regulation at University of California, San Diego, June 2000.
- “Harvesting in a Complex Ecosystem,” (with David Finnoff) International Institute of Fisheries Economics and Trade 2000, Oregon State University, Corvallis, July 2000.
- “Economic Perspectives on Sustainability,” Sustainable Business Symposium, University of Oregon, October 2000.
- “Ecosystems and Economics,” Northland College, Wisconsin, March 2001.
- “Natural Resource Economics,” Envirovet Summer Institute, White Oak Plantation, Yulee, Florida, July 2001.
- “Resource Competition in Plant Communities,” University of Colorado Environmental and Resource Economics Workshop, Breckenridge, CO, July 2001.
- “Harvesting in an Eight Species Ecosystem,” (with David Finnoff) World Congress of Environmental and Resource Economists, Monterey, California, June 2002.
- “Linking Dynamic Economic and Ecological CGE Models,” (with David Finnoff) International Society of Ecological Economics, Montreal, July 2004.
- “Valuing Ecosystem Services Provided by Predators,” (with Seong-Hee Kim) International Society of Ecological Economics, Montreal, July 2004.

- “Linking Ecological and Economic General Equilibrium Models,” (with David Finnoff) DIVERSITAS Workshop on Integrating Economics and Ecology, Paris, France, November, 2004.
- “A general equilibrium ecology/economy model applied to an Alaskan marine system,” (with David Finnoff) Workshop on Ecosystem-Based Decision Support Tools for Fisheries Management, NOAA, Key Largo, Fla. February 2005.
- “Efficient Ecosystem Services and Naturalness in an Ecological/Economic Model,” (with Thomas Eichner) 7th Annual Bioeconomics Conference, University of Cambridge, UK, September 2005.
- “Comparing Modeling Approaches in Invasive Species Management,” Economic Research Service, U.S. Department of Agriculture, Washington, D.C., Oct. 2005.
- “Nature’s Oligopolists,” (with David Finnoff and Aaron Strong) First DIVERSITAS Open Conference on Integrating Bioscience for Human Well Being, Oaxaca, Mexico, November 2005.
- “Modeling Biodiversity Externalities in Natural Ecosystems,” DIVERSITAS ecoSystems Workshop on the Economics of Ecosystem Services. Paris, May 2007.
- “Nonconvexities in Species Growth Functions,” Second DIVERSITAS Open Conference on Integrating Bioscience for Human Well Being, Cape Town, South Africa, October 2009.
- “Nonconvexities in Species Growth Functions,” World Congress of Environmental and Resource Economists, Montreal, Canada, 2010.
- “Economic/Ecological Tradeoffs among Ecosystem Services and Biodiversity Preservation,” Association of Environmental and Resource Economists Conference, Seattle - June, 2011
- “Ecosystem services and the goals of international biodiversity conservation,” Planet under Pressure Conference, London, March 28, 2012.

Ph.D. Dissertations Directed

Robert Lawyer
 Linda Stanley
 Richard Cabe
 Clifford Nowell
 Lisa Crone
 Shiow-Ying Wen
 Paul Turner
 Pete Tsournis
 David Finnoff

Min Gong
Tanvir Hussain