

CURRICULUM VITA

CHARLES D. KOLSTAD

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EDUCATION:

Ph.D. Stanford University (1982)
Eng.-Econ. Sys. (Economics and Operations Research)
Fields: Econometrics, Economic Development
M.A. University of Rochester (1973) Mathematics
B.S. Bates College (1969) Mathematics (High Honors)

PERMANENT FACULTY POSITIONS:

January 1993 to present University of California, Santa Barbara,
Professor and Chair, Department of Economics
Professor, Bren School of Environmental Science and Management
Professor (Affiliate), Environmental Studies Program
[1993 -- 1997: 50% Economics; 50% Environmental Studies Program
2005—Vice Chair, Department of Economics; Jan-Feb 2006 – Acting Chair,
Department of Economics; 2001-2006 – Bren Distinguished Professor of
Environmental Economics (funding for chair eliminated by donor in 2006)].

August 1983- August 1994 University of Illinois, Urbana-Champaign, *Professor*,
Institute for Environmental Studies and Department of Economics;
affiliate, Regional Science Program, Institute for Govt & Public Affairs
(1983-88: *Assistant Professor*; 1988-92 *Associate Professor*)

OTHER PROFESSIONAL POSITIONS:

2009-- *Co-Director*, University of California Center for Energy & Environmental
Economics, UC Berkeley and UC Santa Barbara

2007-- National Bureau of Economic Research, Cambridge, Mass.
Faculty Research Associate (Environmental and Energy Economics Program)

Fall 2007 Department of Agricultural and Resource Economics, University of California,
Berkeley, *Visiting Professor*.

2002-- Resources for the Future, Washington, DC

University Fellow.

- AY2002-3 Department of Economics, Massachusetts Institute of Technology
3M Visiting Professor of Environmental Economics
- Spring 99 & 00 Stanford University, *Visiting Professor of Economics*
- Spring 02 & Fall 95 Stanford University, Institute for International Studies, *Visiting Scholar*
- Summer 1998 New Economic School, Moscow, Russia, *Visiting Professor of Economics*
- April 1998 Catholic University of Leuven, Belgium, *Visiting Professor of Economics*
- January 1993 Catholic University of Leuven, Belgium, *Visiting Professor of Economics*
- Winter, 1992 Univ. of California, Santa Barbara, *Visiting Assoc. Professor of Economics*
- AY1986-7 Massachusetts Institute of Technology
Visiting Assistant Professor of Applied Economics
- June 1985- August 1985 Norwegian School of Economics and Business Administration,
Bergen, Center for Applied Research, *Visiting Scholar*
- August 1974- August 1983 University of California, Los Alamos National Laboratory
(Economics Group), Los Alamos, New Mexico, *Staff Member.*

CURRENT AND RECENT RESEARCH AREAS:

Environmental and resource/energy economics; industrial organization and regulation; public economics; environmental regulation and valuation; economics of information; computation of equilibrium; climate change; coal and electricity markets.

PROFESSIONAL SOCIETY SERVICE:

President, Association of Environmental and Resource Economists (2000-2002)
Board of Directors, Association of Environmental and Resource Economists (1995-97; 2000-03)

EXPERT TESTIMONY and LITIGATION SUPPORT:

US Department of Justice, 2006-- [expert testimony regarding coal contracts and electric utilities]
Latham & Watkins, for PG&E, 2006 [independent review of valuation studies in support of EPA regulatory issue].
Paul, Weiss, Rifkind, Wharton and Garrison, for California Public Utilities Commission, 2002 [expert testimony regarding environmental regulations and regulated utilities, pertaining to PG&E bankruptcy].

Campbell, George and Strong, Houston, 2002 [consultant regarding a natural resource damage claim for groundwater contamination].
Economic Analysis Corporation, 1994-96 [expert testimony on valuing environmental resources -- American Trader Oil Spill].
Charles River Associates (Boston, MA), 1989-1990 (antitrust and economics of coal markets).
Worsham, Forsythe, Sampels and Wooldridge (Dallas, TX), 1988-90 (expert testimony on antitrust, coal markets and electric power)

OTHER CONSULTING AND SELECTED POSITIONS:

Massachusetts Institute of Technology, review of "Aviation Environmental Portfolio Management Tool" (APMT), 2007.
United Nations Environment Programme, January 2000 (co-taught in Kenya, to African water managers, short course on management of lake eutrophication).
The World Bank, 1991--present (various projects).
Oak Ridge National Laboratory (Tenn.), 1990 (review of EIA data collection).
Oak Ridge National Laboratory (Tenn.), 1992-1993 (review Natll Energy Modelling System)
CMT International (Cambridge, MA), May 1987--October 1987 (Kuwait energy policy).
Energy Laboratory, Massachusetts Institute of Technology, 1984-1986 (review of NAPAP Advanced Utility Simulation Model for EPRI, DOE and EPA).
Resource Economics Corporation (Urbana, IL), 1984-94 (economic software development).
Los Alamos National Laboratory (New Mexico), 1983-1988 (European gas, technical change).
New Mexico Energy Research and Development Institute, 1982-1984 (NM Coal Market Study).
Raytheon Corporation, 1973-1974.
Peace Corps, Ghana (West Africa), 1969-1971.

CONGRESSIONAL TESTIMONY:

"The Use of Economic Incentives for Air Pollution Control in the Southwest," presented before the Committee on Environment and Public Works, U.S. Senate, Albuquerque, New Mexico (July 6, 1983).
"The Four Corners Regional Study," presented before the Subcommittee on Health and Environment, U.S. House of Representatives, Washington, D.C. (May 19, 1981).

AWARDS/RECOGNITION:

Fellow, Association of Environmental and Resource Economists (2009)
Fellow, CESiFO, Munich (2009)
Faculty Research Associate, National Bureau of Economic Research (2007)
University Fellow, Resources for the Future, Washington, DC (2002)
Harvard Center for the Environment Visiting Fellow (December 2007).
Nobel Peace Prize, 2007 [awarded jointly to Al Gore and Intergovernmental Panel on Climate Change (IPCC), of which I was a lead author]
Lead Author, UN IPCC WG III, AR4 (2004—2007)
Appointed 3M Visiting Professor of Environmental Economics, MIT (2002-3)
Named Donald Bren Distinguished Professor of Environmental Economics, UCSB (2000)
Nominated, Distinguished Teaching Award, UCSB, March 1999
University Scholar, University of Illinois, 1988-91

List of Faculty Rated as Excellent by Students, University of Illinois, Fall 1989

Arnold O. Beckman Award, 1983-84

Fellowship, Center for Operations Research and Econometrics, Catholic University of Louvain, Belgium, 1983-84, 1992-93 (declined)

ADVISORY BOARDS:

Member, Research Screening Committee, California Air Resources Board (2008--).

Member, Scientific Advisory Committee, California Energy Commission PIER program (2007--).

Member, Advisory Board, Institute for Global Conflict and Cooperation (IGCC), University of California (2006--2007)

Member, Committee on Strategic Advice on the U.S. Climate Change Science Program, National Academy of Sciences (2006--)

Member, Advisory Board, Institute for the Study of Science and the Environment, National Center for Atmospheric Research, Boulder (2005--)

Member, US National Committee for IIASA, National Academy of Sciences (2005--)

Member, Environmental Advisory Committee, California Public Utilities Commission (2005--)

Member, Committee to Review President's Climate Change Research Initiative, *National Academy of Sciences/National Research Council*, 2002--2005.

Member, Scientific Steering Committee, *University of California Revelle Program on Climate Science and Policy*, UCSD Scripps Institution, 2000--2003.

Member, University of California Delegation to Climate Change Conference of the Parties 6 (COP-6), The Hague, Netherlands (Nov. 2000).

Member, Committee on Building a Long-Term Environmental Quality R&D Program in the US Department of Energy, *National Academy of Sciences/National Research Council*, 2000-1.

Member, Board of Advisors, National Ocean Economics Project, 1999 – .

Member, Advisory Council on Clean Air Act Compliance Analysis, *US Environmental Protection Agency*, 1999 – 2004 .

Member, Review Committee, Decision and Information Sciences Division, *Argonne National Laboratory*, Chicago, IL, 1998 – 2003 .

Member, Environmental Economics Advisory Committee, Science Advisory Board, *US Environmental Protection Agency*, 1992 -98.

Member, Risk Reduction Committee, Science Advisory Board, *US Environmental Protection Agency*, 1996-7.

Member, Board on Energy and Environmental Systems, *National Academy of Sciences/National Research Council*, 1994-95

Member, Committee on Fuel Economy of Automobiles and Light Trucks, *National Academy of Sciences/National Research Council*, 1991-92

Member, Energy Engineering Board, *National Academy of Sciences/National Research Council*, 1990-94

Participant, U.S. National Academy of Sciences -- Academy of Sciences of the USSR Program for Young Professional Economists, 1990-91

Participant, Economics Advisory Committee, *Electric Power Research Institute*, 1992

Member, University of Chicago Review Committee for Energy and Environmental Systems Division, *Argonne National Laboratory*, 1988-91

JOURNAL EDITORIAL POSITIONS:

Editor, *Review of Environmental Economics & Policy* (2009--; 2006-9, Co-editor).
Co-Editor, *Resource and Energy Economics* (2002-05 & 1994-97; Editor, 1998--2002)
Board of Editors, *Berkeley Electronic Press Journals in Economic Analysis and Policy* (2001--)
Board of Editors, *Land Economics* (1998--)
Editorial Council, *Journal of Environmental Economics and Management* (1989-91; 1998-01)
Associate Editor, *Journal of Economic Dynamics and Control* (1995-1997)
Associate Editor, *Journal of Environmental Economics and Management* (1992-93)
Board of Editors: *Energy Journal* (1984 -94), *Resource and Energy Economics* (1993 -94)

CONFERENCES ORGANIZED:

Uncertainty and Learning in Environmental Management, Santa Barbara (December 2009), with C. Costello.
Voluntary Approaches to Environmental Protection, Santa Barbara (April 2009), with M. Kotchen.
California Climate Policy Forum, Santa Barbara, California (March 2007).
Retrospective on Twenty Years of Economic Incentives for Environmental Protection, Santa Barbara, California (August 2003), with Jody Freeman.
Economics of Biodiversity, Santa Barbara, California (May 2001), with Geoff Heal.
National Bureau of Economic Research *Workshop on Trade and Environment*, Snowmass, Colorado (Aug. 12, 1998).
First, Second, Third, Fourth, Fifth, Eighth & Ninth *California Environmental Economics Workshop*, Santa Barbara, CA (May, 1993; Oct. 1994; May, 1996; Oct 1998; May 2000; Oct. 2001; Oct. 2003; Oct 2005; Nov. 2006).
Environmental Policy with Economic and Political Integration: The European Community and the United States, University of Illinois, (1993)

PROFESSIONAL ORGANIZATIONS (MEMBERSHIP):

American Economic Association
Association of Environmental and Resource Economists
Econometric Society
European Association of Environmental and Resource Economics
International Association for Energy Economics

RESEARCH GRANTS AND CONTRACTS:

California Energy Commission, "Effects of Climate Change on Agriculture," 2008-2009, \$99,000 (PI).
US Environmental Protection Agency, "Workshops in Environmental Economics," Cooperative Agreement, 2007—2010, \$150,000 (PI).
US Environmental Protection Agency, "Workshops in Environmental Economics," Cooperative Agreement, 2005—2006, \$50,000 (PI)
National Science Foundation, "Integrated Training Program in Economics and Environmental Science," IGERT grant, \$2,696,278, 9/01 – 8/06 (PI).
US Department of Energy, "Measuring Adaptation and Adjustment to Climate Change from the Historic Record," \$164,443, 9/00 -- 8/02 (PI).
University of California Energy Institute Grant, \$17,000, 7/00—6/00 (declined).
US Environmental Protection Agency, "California Workshop on Environmental Resource Economics," \$51,459, 10/98 – 9/01 (PI).

US Department of Agriculture, "Testing Models of Learning and Adaptation for Agriculture in Responding to Climate and Other Shocks," \$25,000, 10/96--12/97 (PI).

US Department of Energy, "Climate Variability, Stochasticity and Learning in Integrated Assessment Models," \$380,182, 9/96 -- 9/99 (PI).

Minerals Management Service, "Valuation of Coastal Resources--Understanding Substitution in Time and Space," \$57,399, 7/1/95--8/1/96 (co-PI).

US Department of Energy, "Learning and Enhanced Climate Representation in Integrated Assessment Models," \$230,000, 9/94--12/96 (PI).

National Institute for Global Environmental Change, Midwest Regional Center, "Incorporating Learning into an Integrated Assessment Model of Climate Change," \$168,109, 7/94--6/97 (PI).

Committee on Research, University of California, Santa Barbara, "The 'Hypotheticalness' of Contingent Valuation," \$4,000, 1994-5 (PI).

University of Illinois Research Board, "An Experimental Test of the Hypothetical Aspect of Contingent Valuation," \$1,950, 1994 (PI).

National Science Foundation, "The Timing of Control of Stock Externalities in the Presence of Learning with an Application to Global Warming," \$121,000, 1991-95 (PI).

US Agency for International Development, "Environmental Policy and Training," approx. \$35,000 per year 1992-94 (part of larger multi-university project).

US Information Agency, "Environmental Policy and the 1992 Integration of Europe," \$99,744, 1991-94 (Co-PI).

University of Illinois Research Board, "The Timing of Control of Stock Externalities with Learning: An Application to Global Warming," \$4,500, 1990-91 (PI).

Illinois World Trade Center Association, "Eastern and Western European Boiler Inventory," \$19,320, 1990 (PI).

Illinois Department of Energy and Natural Resources, "Review of the State-of-the-Art of Measuring Environmental Benefits," \$39,000, September 1987--February 1988 (PI).

Illinois Center for Research on Sulfur in Coal, "The Utility Market for Desulfurized Coal," \$124,000, September 1986--August 1988 (PI).

Illinois Department of Energy and Natural Resources, "Promoting Illinois Coal through Clean Coal Technologies," \$46,000, July 1987--July 1988 (Co-PI).

Massachusetts Institute of Technology, Center for Energy Policy Research, "Studies in Electric Utility Regulation," \$10,000, January 1987--June 1988 (PI).

University of Illinois Research Board, "Studies in Electric Utility Behavior: Bias and Efficiency in Response to Emission Regulations," \$1600, Summer 1986 (PI).

University of Illinois Research Board, "Measuring Market Conduct in a Spatial Market: The Case of US Coal," \$7500, September 1984--July 1985 (PI).

U.S. Department of Energy, "Evaluating Oil and Gas Backout from Electric Utilities," \$100,000, October 1981--September 1982 (PI).

Los Alamos National Laboratory, "Studies in Bi-Level Programming," \$120,000, October 1980--September 1982 (PI).

Los Alamos National Laboratory, "Modeling the International Steam Coal Market," \$100,000, October 1981--September 1982 (PI).

National Commission on Air Quality, "Four Corners Study of Alternatives to the Clean Air Act," \$650,000, October 1980--May 1981 (Co-PI).

PUBLICATIONS:

Books

- Human-Induced Climate Change*, Cambridge University Press, edited with M. Schlesinger, et al. (2007).
- Moving to Markets in Environmental Regulation: Lessons from Thirty Years of Experience*, Oxford University Press (2007), 488pp, edited with Jody Freeman.
- Spatial Environmental and Resource Economics*, Edward Elgar (2000), 447pp.
- Environmental Economics*, Oxford University Press (2000), 400 pp. (translated into Japanese, Spanish and Chinese) [2nd Edition forthcoming, 2009]
- Measuring the Demand for Environmental Quality*, North-Holland, Amsterdam (1991), 370 pp., edited with John Braden.

Currently Active Working Papers

- “Who Pays for a Carbon Tax?,” working paper, with C. Grainger (2008).
- “Economic Impacts of Climate Change on California Agriculture,” working paper, with O. Deschenes and C. Costello. (2008)
- “Uncertainty, Learning and Heterogeneity in International Environmental Agreements,” working paper, with A. Ulph (2008).
- “Voluntary Public Goods Provision, Coalition Formation, and Uncertainty,” working paper, with N. Burger (May 2008).

Refereed Journal Articles

- “[Learning and International Environmental Agreements](#)” *Climatic Change*, **89**:125-41 (2008), with A. Ulph.
- “[Researching Preferences, Valuation and Hypothetical Bias](#),” *Environmental and Resource Economics*, **37**:465-87 (2007), with R.M. Guzman.
- “[Systematic Uncertainty in Self-Enforcing International Environmental Agreements](#),” *J. Env. Econ. & Mgmt.*, **53**:68-79 (2007).
- “[Learning and Climate Change](#),” *Climate Policy*, **6**:585-89 (2006), with B. O’Neill et al.
- “[Interpreting Estimated Environmental Kuznets Curves for Greenhouse Gases](#),” *The Journal of Environment & Development*, **15**:42-49 (2006).
- “[Adjustment Costs from Environmental Change](#),” *J. Env. Econ. & Mgmt.*, **50**:468-95 (2005), with D. Kelly and G. Mitchell.
- “[Piercing the Veil of Uncertainty in Transboundary Pollution Agreements](#),” *Env. and Res. Econ.*, **31**:21-34 (2005).
- “The Simple Analytics of Greenhouse Gas Intensity Reduction Targets,” *Energy Policy*, **33**:2231-36 (2005).
- “Do Lax Environmental Regulations Attract Foreign Investment?,” *Env. and Res Econ.*, **21**:1-22 (2002), with Y. Xing.
- “Solving Infinite Horizon Growth Models with an Environmental Sector,” *Computational Economics*, **18**:217-31 (2001), with D. Kelly.
- “Malthus and Climate Change: Betting On a Stable Population,” *J. Env. Econ. and Mgmt.* **41**:135-61 (2001), with D. Kelly.
- “Is Coal Desulphurisation Worthwhile? Evidence from the Market,” *Energy Policy*, **29**:217-25 (2001), with J. Braden, R. Woock, J. Machado.

- "Valuing Beach Recreation Lost in Environmental Accidents," *J. Water Resources Planning & Mgmt.*, **126**:374-81 (2000) with R. Deacon.
- "Energy and Depletable Resources: Economics and Policy, 1973-98," *J. Env. Econ. and Mgmt.*, **39**:282-305 (2000).
- "Information and the Divergence Between Willingness-to-accept and Willingness-to-pay," *J. Env. Econ. and Mgmt.*, **38**:66-80 (1999), with R.M. Guzman.
- "Bayesian Learning, Growth and Pollution," *J. Econ. Dyn. And Control*, **23**:491-518 (1999), with D. Kelly.
- "Research Trends and Opportunities in Environmental and Resource Economics," *Environmental and Resource Economics*, **11**:383-97 (1998), with R. Deacon, D. Brookshire, A. Fisher, A. Kneese, D. Scrogin, V. Smith, M. Ward and J. Wilen.
- "Cost Functions and Nonlinear Prices: Estimating a Technology with Quality-Differentiated Inputs," *Review of Economics and Statistics*, **80**:444-53 (1998), with M. Turnovsky.
- "Learning and Stock Effects in Environmental Regulation: The Case of Greenhouse Gas Emissions," *J. Env. Econ. and Mgmt.*, **31**:1-18 (1996).
- "Fundamental Irreversibilities in Stock Externalities," *J. Public Economics*, **60**:221-33 (1996).
- "Foreign Direct Investment, Exchange Rate Variability and Demand Uncertainty," *Int'l Economic Review*, **36**:855-73 (1995), with L. Goldberg.
- "Is Technical Change Embodied in the Capital Stock or New Investment?," *Journal of Productivity Analysis*, **5**:385-406 (1994), with J-K Lee.
- "Hotelling Rents in Hotelling Space: Product Differentiation in Exhaustible Resource Markets," *J. Env. Econ & Mgmt.*, **26**:163-180 (1994).
- "George Bush vs. Al Gore: Irreversibilities in Greenhouse Gas Accumulation and Emission Control Investment," *Energy Policy*, **22**:771-78 (1994).
- "The Specification of Dynamics in Cost Function and Factor Demand Estimation," *Review of Economics and Statistics*, **75**:721-26 (1993), with J-K Lee.
- "Measuring the Energy Efficiency and Productivity Impacts of Embodied Technical Change," *Energy Journal*, **14**:33-55 (1993) with E. Berndt and J.-K. Lee.
- "A Model of Homogeneous Input Demand Under Price Uncertainty," *American Economic Review*, **81**:514-538 (1991) with F. Wolak.
- "Computing Cournot-Nash Equilibria," *Operations Research*, **39**:739-748 (1991) with Lars Mathiesen.
- "*Ex Post* Liability for Harm vs. *Ex Ante* Safety Regulation: Substitutes or Complements?," *American Economic Review*, **80**:888-901 (1990) with T. Ulen and G. Johnson.
- "Acid Deposition Regulation and the U.S. Coal Industry," *Energy Policy*, **18**:845-852 (1990).
- "Clean Air and Energy: Reform of the PSD Provisions of the Clean Air Act," *J. Air Poll. Control Assn.*, **40**:177-184 (1990).
- "Derivative Evaluation and Computational Experience with Large Bi-Level Mathematical Programs," *J. Opt. Theory & Applic.*, **65**:485-499 (1990) with L. Lasdon.
- "Aggregate Source/Receptor Relations for the Economic Analysis of Ambient Regulations," *J. Air Poll. Control Assn.*, **39**:824-830 (1989) with M. Williams.
- "Measuring Relative Market Power in the Western US Coal Market Using Shapley Values," *Resources and Energy*, **10**:293-314 (1988) with F. Wolak.
- "Necessary and Sufficient Conditions for Uniqueness of a Cournot Equilibrium," *Rev. Econ. Stud.*, **54**:681-690 (1987) with Lars Mathiesen.
- "Uniformity vs. Differentiation in Regulating Externalities," *J. Env. Econ. & Mgmt.*, **14**:386-399 (1987).
- "Imperfectly Competitive Equilibria in International Commodity Markets," *Amer. J. Agric. Econ.*, **68**(1):27-36 (1986), with A. Burris.

- "Conjectural Variation and the Indeterminacy of Duopolistic Equilibria," *Canadian J. Economics*, 19:656-677 (1986) with F. Wolak.
- "Empirical Properties of Economic Incentives and Command-and-Control Regulations for Air Pollution Control," *Land Economics* 62:250-268 (1986).
- "A Short-Run Capital-Labor-Energy Model of Fuel Demand in the Manufacturing Sector of Seven Major OECD Countries," *OPEC Review*, 10(2):179-214 (Summer 1986), with A. Bopp, R. Pendley and F. Wolak.
- "Strategy and Market Structure in Western Coal Taxation," *Rev. Econ. Stat.*, 67(2):239-249 (1985), with F. Wolak.
- "The Effect of Market Conduct on International Steam Coal Trade," *Eur. Econ. Rev.*, 24:39-59 (1984), with D. Abbey.
- "Competition in Interregional Taxation: The Case of Western Coal," *J. Political Economy*, 91(3):443-460 (1983), with F. Wolak.
- "The Structure of International Steam Coal Markets," *Natural Resources J.*, 23:859-891 (Oct. 1983), with D. S. Abbey.
- "Alternative Air Quality Policy Options in the Four Corners Region," *Southwestern Rev. of Mgmt. and Econ.*, 1(2):29-58 (Summer 1981), with J. F. Roach, A. V. Kneese, and M. D. Williams.
- "Air Quality Implications of a Nuclear Moratorium: An Alternative Analysis," *The Energy Journal*, 2(3):33-48 (July 1981), with Anthony Bopp, Verne Loose and Robert Pendley.
- "American Indians and National Energy Policy," *J. of Energy and Development*, 5(2):221-251 (Spring 1980), with Robert E. Pendley.
- "Thermal Evolution Models for the Valles Caldera with Reference to a Hot-Dry-Rock Geothermal Experiment," *J. of Volcanology and Geothermal Res.*, 3, pp. 197-218 (1978), with T. R. McGetchin.
- "Temperature Coefficient of Resistivity of Silicon and Germanium Near Room Temperature," *Solid-State Electronics*, 11, 639 (1968), with W. M. Bullis, F. H. Brewer and L. J. Swartzendruber.

Chapters in Books

- "Prescriptive Environmental Regulations versus Market-Based Incentives," in Freeman and Kolstad (Eds), *Moving to Markets in Environmental Regulation* (Oxford, New York, 2007).
- "Climate Change Policy Viewed from the U.S.A. and the Role of Intensity Targets," Ch 7 in Bernd Hanjürgens (Ed), *Emissions Trading for Climate Policy: US and European Perspectives*, pp 96-113 (Cambridge University Press, Cambridge, UK, 2005).
- "The Economics of Climate Policy," Ch 30 in K.-G. Maler and J. Vincent (Eds), *Handbook of Environmental Economics*, Vol. 3, pp 1561-1618 (Elsevier, Amsterdam, 2005), with M. Toman.
- "Comment on 'Environmental Policy and Firm Behavior: Abatement Investment and Location Decisions under Uncertainty and Irreversibility' by Anastasios Xepapadeas," in Carlo Carraro and Gilbert E. Metcalf (Eds), *Behavioral and Distributional Effects of Environmental Policy* (University of Chicago Press for National Bureau of Economic Research, Chicago, 2001), pp 306-7.
- "Integrated Assessment Models for Climate Change Control," Ch 4, pp 171-97 in H. Folmer and T. Tietenberg (Eds.), *International Yearbook of Environmental and Resource Economics 1999/2000: A Survey of Current Issues* (Edward Elgar, Cheltenham, UK, 1999), with D. Kelly.
- "Integrated Assessment Modelling of Climate Change," in W.D. Nordhaus (Ed), *Economics and Policy Issues in Climate Change* (Resources for the Future, Washington, DC, 1998).

- "Uncertainty, Learning, Stock Externalities and Capital Irreversibilities," Chapter 2 in E. van Ierland and K. G6rka (Eds.), *Economics of Atmospheric Pollution*, pp 17-30 (Springer-Verlag, Berlin, 1996).
- "The Implications of Learning About Uncertainty for United States/European Greenhouse Gas Policy," chapter 14 in J. B. Braden, H. Folmer and T. S. Ulen (Eds.), *Environmental Policy with Political and Economic Integration* (Edward Elgar, Cheltenham, UK, 1996).
- "Normas Anticontaminaci3n: Enfoques Pasados e Innovaciones," [Regulating Pollution: Past Approaches and Innovations] in Juan Ignacio Varas (Ed.), *Economía del Medio Ambiente en América Latina [The Economics of Ambient Environment in Latin America]*, pp 209-24 (Ediciones Universidad Católica de Chile, Santiago, 1995).
- "The Timing of CO₂ Control in the Face of Uncertainty and Learning," in E.C. van Ierland (ed), *International Environmental Economics* , pp 75-96 (Elsevier, Amsterdam, 1994).
- "Buying Energy and Non-Fuel Minerals: Final, Derived and Speculative Demand," Chapter 20 in *Handbook of Natural Resources and Energy Economics*, Vol. III, A.V. Kneese and J.S. Sweeney (eds.), Handbooks in Economics series, K.J. Arrow and M.D. Intrilligator (eds.) (North-Holland, Amsterdam, 1993), with M. Slade and R. Weiner.
- "Natural Resource Use and the Environment," Chapter 26 in *Handbook of Natural Resources and Energy Economics*, Vol. III, A. V. Kneese and J. S. Sweeney (eds.), Handbooks in Economics series, K. J. Arrow and M. D. Intrilligator (eds.) (North-Holland, Amsterdam, 1993), with J. Krautkraemer.
- "The Law and Economics of Hazardous Materials Transportation: Regulating Harm by Administrative Agency and by Tort Liability," Chapter 15 in *Transportation of Hazardous Materials: Issues in Law, Social Science and Engineering*, Leon Moses and Dan Lindstrom (Eds) (Kluwer Academic Publishers, Boston, 1993), with T. Ulen.
- "Environmental Demand Theory," in Braden and Kolstad (eds.), *Measuring the Demand for Environmental Quality*, North-Holland, Amsterdam (1991), with J. Braden.
- "Computing Equilibria in Imperfectly Competitive Commodity Markets," in O. Guvenen, W.C. Labys and J-B. Lesourd (eds.), *International Commodity Market Models. Advances in Methodology and Applications*, Chapman-Hill, London (1990), with L. Mathiesen.
- "Pollution Possibility Frontiers," pp 273-287 in B. Lev, J. A. Bloom, A. S. Gleit, F. H. Murphy, and C. Shoemaker (eds.), *Strategic Planning in Energy and Natural Resources* (North-Holland, Amsterdam 1987).
- "Computing Dynamic Spatial Oligopolistic Equilibrium in an Exhaustible Resource Market: the Case of Coal," *Quantitative Methods for Market-Oriented Economic Analysis over Space and Time*, W.C. Labys, T. Takayama and N.D. Uri (eds.), Avebury (Gower), Aldershot, UK (1989).
- "Clean Air and Energy: From Conflict to Reconciliation," pp. 163-191 in *Paradoxes of Western Energy Development*, Cyrus M. McKell et al. (eds.) (Westview Press, Boulder, Colorado, 1984), with W. D. Schultze and M. D. Williams.
- "A Dynamic Linear Programming Model for Allocating Energy Supply Activities Within the Rocky Mountain Region of the United States," in *Applied Numerical Modeling*, by C. A. Brebbia (ed.), (Pentech Press, London, 1978), with G. Morris, R. Palmer, R. Pendley and G. Hinman.

Proceedings

- "Beyond the Market Advisory Committee: Proceedings from a Workshop held at Stanford University, January 15, 2008," with O. Ahoobim, N. Burger, C. Crainger, S. MacRae (May 2008).

- "Environmental Protection in a Knowledge-Based Economy," *Proceedings*, Delhi Sustainable Development Summit, Feb 6-9, 2003.
- "The Climate Change Footprint: Will We See It Before It Is Upon Us?", pp 135-57, in *Climate Change: Integrating Science, Economics and Policy*, N. Nakicenovic, W.D. Nordhaus, R. Richels and F.L. Toth (Eds), IIASA, Laxenburg, Austria (December 1996).
- "From Stalin to Yeltsin: Perestroika in US Environmental Policy" prepared for conference: *Environmental Policy: Current Trends, Future Directions* (January 1992).
- "Comment on 'Energy Demand and Supply in the Developing World 1990-2020,' by Churchill" *Proc.*, 1993 World Bank Annual Conference on Development Economics," pp. 459-461 (1994).
- "Mitigating Climate Change Impacts: The Conflicting Effects of Irreversibilities in CO₂ Accumulation and Emission Control Investment," pp 205-18 in *Integrative Assessment of Mitigation, Impacts and Adaptation to Climate Change*, N. Nakicenovic, W.D. Nordhaus, R. Richels, and R.L. Toth (Eds), IIASA, Laxenburg, Austria (May, 1994).
- "Looking vs. Leaping: The Timing of CO₂ Control in the Face of Uncertainty and Learning," pp. 63-82 in Y. Kaya, N. Nakicenovic, W. D. Nordhaus and F. L. Toth (eds), *Costs, Impacts and Benefits of CO₂ Mitigation*, IIASA, Austria (June 1993).
- "Price Formation in International Coal Trade," *Proc.*, *Coaltrans* 91, Berlin, pp. 71-77 (1991).
- "A Framework for Exploring Cost Effective CO₂ Control Paths: Discussant Comments," in *Proceedings of the Workshop on Economic/Energy/Environmental Modeling for Climate Policy Analysis*, David O. Wood and Yoichi Kaya (eds.), MIT Center for Energy Policy Research, Cambridge, Massachusetts, 1991, pp. 409-414.
- "Measuring the Sulfur Premium in Coal," pp. 547-53 in YP Chugh, and R.D. Caudle, eds, *Processing and Utilization of High Sulfur Coals II* (Elsevier, New York, 1987), with J. Braden.
- "Estimating Hedonic Price Functions for Coal," *Proc.*, 1986 North American Meeting of Int'l Assn. of Energy Economists, Cambridge, Massachusetts, November 1986, pp. 73-75 (1987) with M. Turnovsky.
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- "The Effect of Producer and Consumer Behavior on Prices and Trade in the International Steam Coal Market," *Coal Consumers Conference*, Tel Aviv (June 1986).
- "A Capital-Labor-Energy Model of Fuel Demand in the Manufacturing Sector of Seven Major OECD Countries," *Proc.*, Seventh Annual International Conference of International Association of Energy Economists, Bonn, 4: 13-32 (June 3-5, 1985).
- "Efficiency and Equity in Acid Rain Regulation," *Proc.*, Annual North American Meeting of International Association of Energy Economists, San Francisco, California, pp. 479-495 (November 1984).
- "Competitive Interstate Taxation of Western Coal," *Proc.*, Annual North American Meeting of International Association of Energy Economists, Washington, D.C. (June 1983), with F. Wolak.
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["Environmental Economics in Russia: Valuation and Regulatory Distortions."](#) University of California, Santa Barbara, Department of Economics Working Paper 29-98 (1998), with Elena Gorbacheva, Julia Khaleeva and Svetlana Shcherbich.

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Progress in Measuring Energy Demand, Institute for Environmental Studies Staff Paper No. 45, University of Illinois, Urbana, Illinois (Oct. 1987).

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Evaluation of the St. Lucia Geothermal Resource: Macroeconomic Models, Los Alamos National Laboratory Report LA-10212-MS, Los Alamos, NM (August 1984), with A. Burris, L. Trocki and M. Yeaman.

New Mexico Coal Market Study, Summary Report, New Mexico Energy Research and Development Institute Report NMERDI 2-72-4601, Santa Fe, New Mexico (November 1983), with G. Hinman, R. Mitchell, B. Stockton and D. Symes.

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Economic and Regulatory Efficiency in Air Pollution Control, Los Alamos National Laboratory Report LA-9458-T (Thesis), Los Alamos, NM (1982).

Soviet Energy and Western Security, Los Alamos National Laboratory Report LA-9456-MS, Los Alamos, New Mexico (1982), with R. E. Pendley, W. G. Davey and S. A. Maaranen.

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Book Reviews

Recent Modelling Approaches in Applied Energy Economics by Bjerkholt, Olsen and Vislie, Chapman Hall, 1990. Reviewed in the *Energy Journal*, 12:165-167 (1991).

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Other Articles

“Is a Cap-and-Trade System a Disguised Tax?,” *Harvard College Economics Review*, 3(2):22-3 (2009).

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- "Economic Damage from Water Resource Contamination," *Southwest Journal of Hydrology*, 1(6):14-15 (Nov./Dec. 2002)
- "Environmental Protection and Economic Reform in Russia," *EPAT/MUCIA Policy Brief*, July 1993, with A. Golub.
- "Home Energy Projects--How Many Dollars Do They Really Save?" *Alternate Sources of Energy*, No. 30, pp. 12-16 (February 1978).
- "The Economics of the Attached Solar Greenhouse for Home Heating--A Preliminary Assessment," *Proc.*, Second National Passive Solar Conference, pp. 822-826 (1978).
- "Heat Calculations for Greenhouses," *Alternate Sources of Energy*, No. 36, pp. 30-33 (February/March 1979), with D. P. Grimmer.
- "An Inexpensive Method for Constructing Darrieus Wind Turbine Blades," *Alternate Sources of Energy*, No. 29, pp. 14-20 (December 1977), with D. P. Grimmer.
- "Why an Owner Built Greenhouse is Competitive with Gas for Home Heating in Northern New Mexico," *Bulletin*, New Mexico Solar Energy Association, 2(1), pp. 5-8 (1977).

POSTDOCTORAL SUPERVISION:

David L. Kelly, Ph.D., Carnegie-Mellon University (1994), 5/95 -- 7/98
Currently: Associate Professor of Economics, University of Miami.

DISSERTATION COMMITTEES:

Doctoral (Research Supervisor)

Corbett Grainger (UCSB, Economics, pending)
Ross Mohr (UCSB, Economics, pending)
Elizabeth Ashley (UCSB, Economics, pending)
Leopoldo Soto (UCSB, Economics, PhD, pending)
Sarani Saha (UCSB, Bren School, PhD, 2007), "Three Essays in Environmental and Public Economics" [currently Assistant Professor of Economics, IIT, Kanpur]
Glenn Mitchell (UCSB, Economics, PhD, 2000, "Technology, Energy and the Environment") [currently with Competition Policy Associates, Los Angeles]
Gregory Hunter (UCSB, Economics, PhD, 2000, "Essays on Public Goods Provision Under Uncertainty: Incomplete Markets, Hyperbolic Discounting, and Alienable Emission Permits) [initially Assistant Professor of Economics, Tilburg University, Netherlands; currently Assistant Professor of Economics, California State University, Pomona]
Jeff Wagner (UIUC, Economics, Ph.D., 1998, "Economic Aspects of Radioactive Waste Management") [Currently faculty member at Rochester Institute of Technology]
Yuqing Xing (UIUC, Economics, Ph.D., 1995, "Trade and Environment") [Currently a faculty member at International University of Japan]
Maria Cunha-e-sa (UIUC, Economics, Ph.D., 1994; Thesis title: "Essays in Environmental Economics: An Application to the Case of the Accumulation of Pollution") [Currently a faculty member at New University of Lisbon, Portugal]
Jong-Kun Lee (UIUC, Economics; Ph.D., 1991; Thesis title: "Modeling and Measuring Technical Change and Productivity Growth") [Currently with the Bank of Korea]
Rodger Woock (UIUC, Economics; Ph.D., 1989; Thesis title: "Market Power and Transportation Price Formation: Theory and an Application to the Captive Shipper Problem") [Currently at FCC]

Doctoral (Committee Member Only)

Alief A. Rezza (NHH, PhD, pending)
Laura Grant (UCSB Bren School, PhD, pending)
Alison Huang (UCSB Bren School, PhD, 2008)
Sofia Franco (UCSB, Bren School, Ph.D., 2007)
Edmund Balsdon (UCSB, Economics; Ph.D., 2000)
Shawn Knabb (UCSB, Economics, Ph.D., 2001)
Rolando M. Guzman (UIUC, Economics; Ph.D., 1997)
Roxanna Barrantes (UIUC, Economics; Ph.D., 1992)
Noelwal Netusil (UIUC, Economics; Ph.D., 1992)
Aisling J. Reynolds (UIUC, Geography; Ph.D., 1989)
Khalid Abdul Rahim (UIUC, Agricultural Economics, Ph.D., 1989)
Dan Biller (UIUC, Economics; Ph.D., 1990)
Sundak Suh (UIUC, Urban and Regional Planning; Ph.D., 1989)
Omar Ben-Ayed (UIUC, Business Administration; Ph.D., 1988)
Dah-Nein Tzang (UIUC, Economics; Ph.D., 1985)

Lon Carlson (UIUC, Economics; Ph.D., 1984)

Masters

Larry Hull (MIT, Management; M.Sc., 1987)

Cosimo Asciente (UIUC, Agricultural Economics; MA, 1992)

INVITED LECTURES

2008:

Workshop on R&D and Climate Change, Stanford

Snowmass Workshop on Integrated Assessment and Climate Change

IPCC Working Group III Outreach Event, Tokyo

International Energy and Resource Productivity Conference, UCSB

Japanese Environmental Economics and Policy Meeting, Tokyo [keynote address]

Colorado State University

Norwegian School of Economics (Bergen)

Ragnar Frisch Centre for Economic Research (Oslo)

University of Oslo

University of Venice

2007:

University of Maryland (College Park)

University of California, Berkeley

Resources for the Future

Harvard University (research seminar)

Harvard University (public lecture)

National Bureau of Economic Research

Columbia University

DISCOURS, Hawaii

California Climate Change Conference (Sacramento)

University of Alberta (Edmonton)

Haagen-Smit Symposium (Monterey)

Ohio University

Delhi Sustainable Development Summit

Foundation Eni Enrico Mattei--FEEM (Milan)

Western States Water Council Climate Change Workshop (Irvine)

California Council on Science and Technology

2006:

University of Pennsylvania Law School

Arizona State University

University of Miami

Catholic University at Leuven (Belgium)

Second Atlantic Workshop on Energy Markets and Externalities (Spain)

Conference on Learning and Climate Change, IIASA (Austria)

Global Forum on the Economics Benefits of Climate Change Policies, OECD (Paris)

Bren School Corporate Partner's Summit

2005:

Texas A&M Department of Economics
State Legislative Leaders Foundation (Bren School, UCSB)
Environmental Defense Transatlantic Dialog (Brussels)
Norwegian Climate, Oceans and Policy Conference (Washington)

2004:

University of Central Florida
Duke University (Nicholas School)
Snowmass Workshop on Climate

2003:

Boston University
Dartmouth College
Delhi School of Economics
Delhi Sustainability Summit (February 2003)
First Latin American and Caribbean Congress of Environmental and Resource Economists,
Cartagena, Colombia [Keynote address]
Harvard University
Indian Institute of Management, Kolkata, India
Indian Statistical Institute (Delhi)
Indira Gandhi Institute for Development Research, Mumbai, India
Madras School of Economics, Chennai, India
Massachusetts Institute of Technology
MIT Global Change Forum
North Carolina State University
Rochester Institute of Technology
Sandia National Laboratory
Snowmass Workshop on Technology and Climate
The Energy and Resources Institute, Delhi
UCLA
University of California, Santa Barbara
University of Connecticut
University of Leuven, Belgium
University of Southern Denmark, Center for Fisheries & Aquaculture Mgmt & Economics
University of Wyoming
Yale University

1986—2002:

Academy of Science of USSR, Institute for Social and Economic Problems (1991)
Argonne National Lab (1988)
Bates College (2001)
Catholic University of Chile (1993)
Catholic University of Leuven, Belgium (1993, 1998)
Center for Operations Research and Econometrics (CORE), Belgium (1991, 1998)
Coaltrans, Netherlands (1988)
Colorado School of Mines (1987, 1991)
European Association of Environmental and Resource Economists (Keynote, 1996)
Free University of Amsterdam (1993)
Fukuoka University, Japan (2001)
Harvard University (1996)

IIASA, Vienna (1992, 1993, 1996)
Kyushu University, Japan (2001)
MIT (1987, 2000)
MIT/Tokyo University, Climate Change Workshop (1990)
NBER Workshop on IPCC Integrated Assessment (1996)
New Economic School, Moscow (1997, 1998)
NOAA Workshop on Climate, Duke University (1997)
Norwegian School of Economics (1988, 1991)
Oak Ridge National Laboratory (1991)
Oregon State University (1997)
Portland State University (1997)
Purdue University (1989)
Rand Corp (1993)
Resources for the Future (1987)
Rice University, Global Warming Conference (2000)
Stanford University (1994, 1995, 1999, 2000)
Tel-Aviv University (1986)
Tufts University, NAS/ASUSSR Workshop (1990)
Tulane University (2000)
Twente University, Netherlands (1993)
US Army Environmental Policy Institute (1991)
University of Alberta (1994)
University of British Columbia (1987)
University of Calgary (1994)
University of California, Berkeley (1995, 1997)
University of California, San Diego (1993)
University of California, Santa Barbara (1991)
University of Chicago (1988)
University of Colorado (1997)
University of Illinois (1986, 1987, 1988, 1989, 1990, 1993)
University of Michigan (1992, 1996)
University of Tennessee (1991)
University of Washington (1987)
University of Wyoming (1991)
Wageningen University, Netherlands (1993, 1994, 2002)
World Bank Annual Conference on Development Economics (1993)

CONTRIBUTED CONFERENCE PAPERS (from 1986):

Allied Social Science Assn./AERE (1990, 1992, 1995, 1996, 2004)
Applied Economics Assn, Commodity Trade Conference (1988)
California Workshop on Environmental and Resource Economics (1993, 94, 96, 98, 03)
Center for Strategic and Int'l Studies (1987)
Environmental Policy: Current Trends, Future Directions, Chicago (1992)
European Assn. of Environmental and Resource Economists (1991, 92, 93, 94, 2000, 03, 08)
Int'l Assn Energy Economics, International Mtg (1988, 1990, 1994, 1997)
Int'l Assn Energy Economics, North American Mtg (1986)
Int'l Assn Energy Economics, Scandinavian Mtg (1986)
International Energy Workshop, IIASA, Austria (1987, 1991)

NBER Summer Workshop in Environmental Economics (1996, 1999, 2001).
NBER Environmental Working Group (2004, 2007)
Operations Research Society of America (1986, 1987, 1990)
Southern Illinois University Coal Conference (1987)

TEACHING

UCSB:

Econ 115/EnvSt 175: *Environmental Economics* (upper level undergrad)
EnvSt 174: *Environmental Policy and Economics* (lower level undergrad)
Econ 260B: *Environmental Economics* (PhD level)
ESM 243: *Environmental Policy Analysis* (Masters level)
ESM 204: *Economics for Environmental Management* (Masters level)
Econ 594ER: *Workshop in Env. & Res Econ* (PhD level, with other faculty)
ESM 595EE: *Cross-disciplinary Seminar in Economics & Env. Science* (Ph.D.)

UIUC:

Economics 300: *Intermediate Microeconomics* (undergrad)
EnvSt 236: *Tomorrow's Environment* (lower level undergrad)
Economics 495: *Public and Environmental Economics Workshop* (PhD level)
Economics 464: *Environmental Economics* (PhD level)
EnvSt 341: *Environmental Simulation* (upper level undergrad)
Economics 389: *Industrial Organization* (upper level undergrad)
Economics 288: *Government Regulation of Economic Activity* (undergrad)
LAS 295: *Environmental Quality* (Honors, lower level undergrad)
Economics 463: *Resource Economics* (PhD level)

MIT:

14.42/14.420: *Environmental Economics & Policy* (Undergrad and Grad level)
15.019: *Energy Economics and Policy* (Masters level)

STANFORD:

Economics 101: *Economic Policy Analysis* (upper level undergrad)
Economics 155: *Environmental Economics and Policy* (upper level undergrad)