

## Geoffrey Heal. Curriculum Vitae.

July 2013

**Position:** Donald C. Waite Professor of Social Enterprise and Professor of Economics and Finance, Graduate School of Business, Columbia University, and Professor, School of International and Public Affairs.

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**Personal:** Married, three children.  
Conversational French and German.

### **Education:**

1963-1966 Churchill College, Cambridge. College Entrance Scholar in Physics. Studied Physics, then Economics. BA with First Class Honors.

1966-67 Flood Fellow, University of California, Berkeley, California.

1967-68 Doctoral Student, Churchill College, Cambridge.

1969 Ph.D. in Economics, Cambridge University.  
Thesis Title: "Planning without Prices."

### **Fields of Specialization:**

Economics of Natural Resources and the Environment  
Economic Theory & Mathematical Economics  
Regulation and Increasing Returns  
Resource Allocation under Uncertainty

### **Academic Positions (permanent):**

1968-73 Fellow of Christ's College, Cambridge.

1969-73 Director of Studies in Economics, Christ's College, Cambridge.

1969-73 University Assistant Lecturer in Economics, Cambridge University

1973-80 Professor of Economics, University of Sussex.

1980-83 Professor of Economics, University of Essex.

- 1983 on Professor of Economics, Columbia Business School.
- 1991-94 Senior Vice Dean, Columbia Business School. Chief Academic Officer of the School, responsible for all matters relating to a full-time faculty of 100 and related support services including secretarial & administrative staff and computing services. Responsible for radical overhaul of MBA curriculum, of computer systems and their use in teaching & research, and of process of faculty governance and faculty performance evaluation.
- 1995 Paul Garrett Professor of Public Policy and Business Responsibility, Columbia University Graduate School of Business.
- 1995-99 Academic Director, Executive MBA Program, Columbia Business School.
- 2002 - Professor, School of International and Public Affairs

**Academic Positions (visiting):**

- 1972 Research Staff Economist, Cowles Foundation for Research in Economics, Yale University.
- 1975 Visiting Professor of Economics, Yale University (fall).
- 1976 Visiting Professor of Economics, Stanford University.
- 1978 Visiting Professor of Economics, Université de Paris XII.
- 1979 Wesley Clair Mitchell Research Professor of Economics, Columbia University.
- 1980 UK Social Science Research Council Professorial Fellowship.
- 1982 Visiting Scholar, International Institute for Applied Systems Analysis (IIASA), Austria.
- 1982 Visiting Professor of Economics, Yale University.
- 1983 Visiting Professor of Economics, Princeton University.
- 1983 Visiting Professor of Economics, University of Stockholm.
- 1984 Visiting Professor, Institute for Mathematics and its Applications, University of Minnesota.
- 1992 Visiting Professor, University of Siena.
- 1993 Visiting Professor, University of Siena.

- 1997 Fulbright Professor, University of Siena.
- 1997 Visiting Professor, Universite de Paris X Nanterre.
- 1998 Visiting Scholar, Center for Environmental Science and Policy, Stanford University.
- 2009 Visiting Scholar, London School of Economics, Grantham Research Institute

**Professional Positions:**

- 1969-80 Member of the Editorial Board, Review of Economic Studies.
- 1971-75 Managing Editor, Review of Economic Studies.
- 1973-80 Member of the European Programme Committee of the Econometric Council.
- 1974-79 Member of the Economics Committee of the UK Social Sciences Research Council.
- 1978 on Member of the Editorial Board, Economics Letters.
- 1978 on Member of the Editorial Board, Energy and Resource Economics.
- 1978-79 Member, Steering Committee of US National Academy of Sciences Project on “Resource and Environmental Constraints of Economic Growth.”
- 1980 Program Co-chair, European Meetings of the Econometric Society.
- 1981 Member, Advisory Committee, Systems and Decisions Sciences Area, International Institute of Applied Analysis (IIASA), Austria.
- 1981-85 Associate Editor, Econometrica.
- 1985 on Associate Editor, Social Choice and Welfare.
- 1992 on Associate Editor, Resources and Energy Economics.
- 1992-1995 Chair, Economics Advisory Committee, NOAA.
- 1993 on Associate Editor, Journal of International and Comparative Economics.
- 1993 Associate Editor, Economics of Environmentally Sustainable Development.
- 1994 Participant, White House Conference of Environmental Policy.
- 1997 Member, President’s Committee of Advisors on Science and Technology (PCAST), subcommittee on biodiversity.

- 1999 Member of the Board, Union of Concerned Scientists.
- 1999 Director, Beijer Institute of the Royal Swedish Academy of Sciences 1999-2004
- 2000 Commissioner, Pew Oceans Commission. 2000-2003
- 2001 International Research Fellow of the [Kiel Institute of World Economics](#)
- 2002 Chair, National Academy of Sciences-National Research Council Committee on the economic valuation of ecosystem services. 2002-2005
- 2003 Member, Science Advisory Board of the U.S. Environmental Protection Agency
- 2007 Managing Editor, Social Science Research Network, Environmental Impacts of Business Abstracts, Sponsored by Aspen Institute Business and Society Program
- 2008 Member of the Committee on the Measurement of Economic Performance and Social Progress constituted to advise President Sarkozy of France on the reform of the measurement of national income, chair of the subgroup on sustainability.
- 2011 Coordinating Lead Author, Working Group II, Intergovernmental Panel on Climate Change
- 2013 Member, High Level Experts Group on the Measurement of Economic Performance and Social Progress of the Organization for Economic Cooperation and Development.

**Honors:**

- 1976 Ruben Gustavson Memorial Lecturer, University of Chicago.
- 1977 Elected Fellow of the Econometric Society.
- 1977 Invited Plenary Speaker, Fourth World Congress of the International Economic Association, Tokyo, Japan.
- 1979 Invited Plenary Speaker, Arbeitstagung der Verein fur Sozialpolitik, Mannheim, Germany.
- 1980 Elected President-Elect, Association of Environmental & Resource Economists.
- 1982 President, Association of Environmental & Resource Economists.
- 1983 Listed in Who's Who in Economics, a biographical listing of the 400 most-cited economists. New edition published in 2000.

- 1994        Invited Plenary Speaker, Canadian Association of Social Scientists, Ottawa, Canada.
- 1994        Invited Plenary Speaker, International Forum on Uncertainty and Risk, Oslo, Norway.
- 1995        Lief Johansen Lecturer, University of Oslo and Central Bank of Norway.
- 1996        Invited Plenary Speaker, European Association of Environmental and Resource Economists.
- 1997        Fulbright Professor of Economics, University of Siena.
- 1997        Commencement Speaker, University of California at Berkeley, College of Natural Resources.
- 2004        Invited Plenary Speaker, World Congress of the International Economic Association, Buenos Aires.
- 2005        Member of the Board, Union of Concerned Scientists.
- 2001        Plenary Speaker, Congress of the European Association of Environmental and Resource Economists.
- 2001        International Fellow, Kiel Institute for World Economics
- 2004        Recipient of the Association of Environmental and Resource Economist's *Award for Publication of Enduring Quality* for the book *Economic theory and Exhaustible Resources* (with Dasgupta), Cambridge University Press, 1979.
- 2006        Fellow, Association of Environmental and Resource Economists
- 2008        Honorary Doctorate, Université de Paris Dauphine

Listed in Who's Who in Industry and Finance, Who's Who in Education, and Who's Who in the East, Who's Who in Science and Technology, Who's Who in the USA, Who's Who in the World and Who's Who in Economics

**Outside Non-Academic Activities:**

Consultant on various occasions to:

UK Department of the Environment (on measuring preferences for environmental quality.)

UK Department of Industry (on waste management & recycling.)

US Federal Energy Administration (on modeling energy use.)

US Electric Power Research Institute (on allocation of funds between alternative R&D projects.)

UK Office of Fair Trading (on welfare impact of retail trading practices.)

UK Department of Energy (on estimating energy demand systems for the UK.)

Organization of Petroleum Exporting Countries (OPEC) (on modeling world oil market.)

Phillips Petroleum (on pricing of North Sea Gas.)

US Internal Revenue Service (on tax shelters & commodity markets.)

H.E. The Secretary General, United Nations Conference on Trade & Development (UNCTAD).

United Nations Institute of Training & Research (UNITAR) (on energy use in developing countries.)

United Nations Conference on Trade & Development on International Environmental Policy.

Organization for Economic Cooperation and Development on International Environmental Policy.

Global Environmental Facility

United Mine Workers of America

International Brotherhood of Teamsters

The World Bank

Director and Co-owner, Economists Advisory Group (consulting firm), 1977-82.

Associate, Economist Intelligence Unit (consultancy arm of The Economist magazine), 1981-84. The Economist purchased The Economists Advisory Group and has since run it as Economist Intelligence Unit.

Founder, Director and President, FITEL Ltd. (providing computer & communications services to the international securities industry), 1985-89. Now co-owned by Lucent Technologies.

Director, Union of Concerned Scientists, 2003 on. Member of the Finance Committee and Governance Committee

Founder and Board Member, Coalition for Rainforest Nations, 2005 on. Chairman of the Board, 2012 on.

Director, Petromin Holdings PNG Ltd. (The national oil, gas and mineral company of Papua New Guinea) 2007-2009.

Coordinating Lead Author, Working Group II, Intergovernmental Panel on Climate Change, 2010 to 2014

Member of the Investment Committee, The Eco Products Fund (a private equity group), 2007-2010

Member of the Board, Public Business Media, 2011 on.

Advisor to the World Bank on Green Growth, 2010 on.

Expert witness on corporate responsibility to Bucci Bailey and Javins L.C., 2011-2012: 2014 on

2013 Member of the Advisory Board, The Green Seal

### **Teaching Experience:**

Microeconomics at all levels from first year undergraduate to advanced Ph.D., including extensive MBA and executive micro teaching.

Awarded Executive MBA Teaching Award, 1992.

Awarded Social Enterprise Program Teaching Award 2005

Resource and environmental economics to undergraduate, MBA and graduate audiences.

The International Oil market.

International Economics.

Mathematical Economics.

Public Sector Economics & Regulation.

Corporate Social Responsibility

Current Developments in Energy Markets

### **Books Published:**

- 1 The Theory of Economic Planning, North Holland Publishing Co., 1973. Italian and Spanish translations published 1975. Japanese translation 1995.
- 2 Linear Algebra & Linear Economics. Macmillan, 1974.
- 3 Economic Theory & Exhaustible Resources. Cambridge University Press, 1979. Reprinted five times.
- 4 Public Policy & the Tax System: Essays in Honour of J.E. Meade. (co-editor), Allen & Unwin, 1980. Spanish translation.
- 5 The Evolving International Economy, Cambridge University Press, 1987.
- 6 Oil and the International Economy, Oxford University Press, 1991.
- 7 The Economics of Exhaustible Resources. The International Library of Critical Writings in Economics, Edward Elgar, 1993.
- 8 Sustainability: Dynamics and Uncertainty (co-editor). Kluwer Academic Publishers, for Fondazione ENI Enrico Mattei, 1997.
- 9 Topological Social Choice, (editor) Springer Verlag, 1997
- 10 Valuing the Future: Economic Theory and Sustainability. Columbia University Press, 1998.
- 11 The Economics of Increasing Returns, (editor) The International Library of Critical Writings in Economics, Edward Elgar, 1999.
- 12 Environmental Markets (co-editor) Columbia University Press, 2000.
- 13 Nature and the Marketplace. Island Press, 2000. (Japanese translation 2006, Chinese 2007)
- 14 America's Living Oceans: Setting a Course for Change, report of the Pew Oceans Commission, 2003.
- 15 Valuing Ecosystem Services. Editor, Report of the National Research Council/National Academy of Sciences, to be published 2004.
- 16 When Principles Pay: Corporate Social Responsibility and the Bottom Line. Columbia Business School Press, 2008
- 17 The Sustainability of Economic Growth, (editor), International Economic Association/Palgrave, 2009.
- 18 Whole Earth Economics, 2014.

**Articles published or in working paper form:**



### On Resource and Environmental Economics:

- 1 “The Depletion of Exhaustible Resources,” in *Essays in Modern Economics*, edited by M. Parkin, Longmans, 1974.
- 2 “The Optimal Depletion of Exhaustible Resources,” (with P.S. Dasgupta), *Review of Economic Studies*, Symposium on the Economics of Exhaustible resources, 1974, pp. 3-28,. Reprinted in V.L. Smith (ed.) *Readings in the Economics of Resources*.
- 3 “Economic Aspects of Natural Resource Depletion,” in *The Economics of Resource Depletion*, edited by D.W. Pearce for the Social Science Research Council, Macmillian, 1974.
- 4 “The Relationship between Interest Rates and Metal Price Movements,” *Review of Economic Studies*, January, 1980, XLVII, pp. 161-181.
- 5 “The Relationship Between Price and Extraction Cost for a Resource with a Backstop Technology,” *The Bell Journal of Economics & Management Science*, 1976, 7,2, pp. 371-378.
- 6 “Resource Management in a Trading Economy” (with P.S. Dasgupta & R.K. Eastwood), *The Quarterly Journal of Economics*, 1978.
- 7 “Resource Depletion & Research & Development,” (with P.S. Dasgupta & M.K. Majumdar) in M.D. Intrilligator (ed.) *Frontiers of Quantitative Economics*, Vol. IIIB, Chapter 12A, pp. 483-505. North Holland Publishing Co., 1976.
- 8 “Does the Price System Work for Resources?” Reuben Gustavson Memorial Lecture, University of Chicago, 1976.
- 9 “Uncertainty and the Optimal Supply Policy for an Exhaustible Resource,” in R.S. Pindyck (ed.) *Advances in the Economics of Energy & Resources*, vol. 2, pp. 119-147, J.A.I. Press, 1977.
- 10 “The Long-Run Movement of Resource Prices,” Plenary Session Paper, Fourth Published in E. Malinvaud (ed.) *Economic Growth & Resources: The Major Issues*, Macmillian, 1979.
- 11 “On a Relationship Between Economic & Thermodynamic Optima” (with R.S. Berry & P. Salomon), *Resources & Energy*, 1978, vol. 1, pp. 125-137.
- 12 “Energy Demand in the UK” (with M. Barrow). Study for the UK Department of Energy, 1978.
- 13 “Economics & Resources,” in J. A. Butlin (ed.) *Economic Analysis of Resource Depletion*, Longmans, 1979.
- 14 “Funding Research & Development” (with P.S. Dasgupta and A.K. Pand), *Applied Mathematical Modeling*, 1980.
- 15 “Intertemporal Allocation and Intergenerational Equity,” in *Ershopfbare Ressourcen, Schriften des Vereins fur Sozialpolitik*, Band 108, 1980.

- 16 “The Taxation of Exhaustible Resources” (with P.S. Dasgupta and J.E. Stiglitz) in G. M. Heal and G.A. Hughes (eds.) *Public Policy and the Tax System: Essays in Honour of J.E. Meade*, Longmans, 1980, pp. 150-172.
- 17 “Empirical Investigation of the Long Run Movement of Natural Resource Prices: A Preliminary Report” (with M. Barrow), *Economics Letters*, 7, 1981, pp. 95-103.
- 18 “An Econometric Evaluation of Long-Run Movement of Mineral Prices” (with M. Barrow), in V.K. Smith (ed.) *New Approaches to Modeling Resource Markets*, Johns Hopkins for Resources for the Future, 1981.
- 19 “The Use of Common Property Resources,” in *Restructuring the Economics of Natural Resources*, ed. by J. Krutilla & V.K. Smith for Resources for the Future, Johns Hopkins, 1981.
- 20 “Scarcity, Efficiency & Disequilibrium in Resource Markets,” *Scandinavian Journal of Economics*, 1981.
- 21 “Resource Prices and Resource Scarcity,” in *Proceedings of the Wisconsin Seminar on Natural Resource Policies in Economic Development*, University of Wisconsin, Madison.
- 22 “Non-conflicting Oil Pricing Policies in the Long Run” (with G. Chichilnisky & A. Sepahban), *OPEC Review*, 1982.
- 23 “Interaction between Economy & Climate: a Framework for Policy Design under Uncertainty,” presented at a conference organized by the National Climate Program and the N.S.F. and published in V.K. Smith and A.D. White (eds.) *Advances in Applied Micro-Economics*, J.A.I. Press, 1984.
- 24 “The Intertemporal Problem” in *Natural Resource Economics*, D.W. Bromley (ed.), Kluwer Nijhoff, 1986.
- 25 “Resources Naturelles, Commerce et Endettment” (with G. Chichilnisky & D. McLoed), in G. Gaudet & P. Lasserre (eds.) *Resources Naturelles & Theorie Economique*, Les Presses de l’Universite Laval.
- 26 “Depletion and Discounting: a Classical Issue in Resource Economics,” in R. McElvey (ed.) *Environmental and Natural Resource Mathematics*, Vol. 32 pp. 33-43 of Proceedings of Symposia in Applied Mathematics, American Mathematical Society, Providence, Rhode Island, 1985.
- 27 “Resources Trade & Debt: the Case of Mexico” (with G. Chichilnisky & D. McLoed), The World Bank, Global Analysis and Projects Division, Division Working Paper No. 1984-5, 1984.
- 28 “Energy Capital Substitution: a General Equilibrium Analysis” (with G. Chichilnisky), Collaborative Paper, IIASA, Laxenburg, Austria, 1983.

- 29 “The World Oil Market, Past & Future” (with G. Chichilnisky) *Columbia Journal of World Business*, Spring 1984.
- 30 “Economy and Climate: a Preliminary Framework for Microeconomic Analysis,” in R.E. Just & N. Bockstael (eds.), *Commodity and Resource Policies in Agricultural Systems*. Springer, Berlin, Heidelberg, New York, 1991, pp. 196-212.
- 31 “Optimal Resource Use” in J. Sweeney (ed.) *Handbook of Natural Resource Economics*, Vol. 3, Chapter 18, pp. 855-880, North Holland Publishing Co., 1993.
- 32 “Economics and Global Change.” Published by NASA/NSF/NOAA, 1991. One of panel of academics and governmental officials who wrote this interagency report.
- 33 “International Negotiations on Emission Control.” Discussion paper, Columbia Business School, 1991. *Economic Dynamics and Structural Change*, 1993, vol. 3, no. 2, 223-240.
- 34 “Risk Management and the Greenhouse Effect.” Presented at the First Nordic Conference of the Greenhouse Effect in Copenhagen, September, 1991.
- 35 “The Rain Drain” (with G. Chichilnisky), Hermes, Summer, 1992.
- 36 “Application of the Polluter Pays Principle in Developing Countries” in *Fair Principles for Sustainable Development*, edited by E. Dommen, UNCTAD, Geneva, 1992. Edward Elgar, 1993.
- 37 “Global Environmental Risks” (with G. Chichilnisky) *Journal of Economic Perspectives*, Fall 1993, Vol. 7, No. 4, 65-86.
- 38 “Sustainable Growth and the Green Golden Rule” (with A. Beltratti and G. Chichilnisky), paper presented at OECD conference on Sustainable Growth, Paris, 1993, in Ian Goldin and L. Alan Winters (eds.) *Economic Approaches to Sustainable Development*, OECD, Paris, 1994, pp. 147-166.
- 39 “Formation of International Environmental Agreements,” in C. Carraro (ed.) *The International Dimension of Environmental Policy*, Kluwer, 1994.
- 40 “Valuing the Long Run: Environment and Discounting.” Working paper, Columbia Business School, 1993.
- 41 “Who Should Abate Carbon Emissions? An International Perspective” (with G. Chichilnisky). *Economic Letters*, 1994, 44, 443-449.
- 42 “The Green Golden Rule” (with A. Beltratti and G. Chichilnisky. *Economic Letters*, 49, 1995, pp. 175-179.
- 44 “Strategic Behavior in Permit Markets” (with Y. Lin). In *Environmental Markets*, G. Chichilnisky and G.M. Heal (eds), Columbia University Press.

- 45 “Markets and Biodiversity,” paper presented at conference Biological Diversity: Exploring the Complexities, in *Protecting Biodiversity: Converging Strategies*, pp. 209-230, Duke University Press, 1998, edited by Lakshman Guruswamy.
- 46 “Interpretations of Sustainability,” presented at the Plenary Session of the Canadian Association of Social Sciences. Published in *Social Sciences and the Environment* (ed.) L. Quesnel, University of Ottawa Press, 1995, 119-143.
- 47 “The Environment and the Long-run: Exploring Alternative Optimality Criteria” (with Beltratti and Chichilnisky), *Recherche Economique*, 1994, 48, 319-340.
- 48 “Uncertain Future Preferences and Conservation” (with Beltratti and Chichilnisky), in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 49 “Interpreting Sustainability,” Plenary Address, European Association of Environmental and Resource Economists, Lisbon, 1996, in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 50 “Markets for Tradable Carbon Dioxide Emission Quotas: Principles and Practice” (with Chichilnisky), a report to the OECD, published by them in 1994. In *Environmental Markets*, G. Chichilnisky and G.M. Heal (eds), Columbia University Press.
- 51 “The International Dimensions of Environmental Policy.” *Journal of International and Comparative Economics*, Vol. 4, 1995.
- 52 “International Dimensions of Environmental Policy.” *Agriculture, Trade and the Environment: Discovering and Measuring the Critical Linkages*, (eds.) M. Bredahl, N. Ballenger, J. Dunmore and T. Roe, Westview Press, 1996.
- 53 “Building Linkages between Climate, Impacts and Economics: a New Approach to Integrated Assessment,” (with Chichilnisky, Gornitz, Rind and Rosenzweig).
- 54 “The Economic Value of Climate Forecasts: a Case Study of the Impact of El Nino-Southern Oscillator on the Economy of Zimbabwe,” (with Y. Lin). Forthcoming in *Climatic Change*.
- 55 “Global Environmental Risks” (with G. Chichilnisky), in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 57 “Sustainable Use of Renewable Resources,” (with Beltratti and Chichilnisky) in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 58 “Discounting and Climate Change”, *Climatic Change*, December, 1997.
- 59 “Economic Returns from the Biosphere” (with G. Chichilnisky). Working paper, Columbia Business School, 1997. *Nature*. vol 391, February 1998.

60. "Economy and Environment", Commencement Address, UC Berkeley, May 1997.
61. "Emission Constraints, Emission Permits and Marginal Abatement Costs". In *Environmental Markets*, Columbia University Press, 1998, edited by Chichilnisky and Heal. Also published in *Topics in Environmental Economics*, edited by M. Bowman et al, Kluwer, 1999.
62. "Markets and Sustainability". *The Science of the Total Environment*, 240 (1999) 75-89, special issue devoted to proceedings of a conference on *Managing Biodiversity*, organized by Resources for the Future and the Electric Power Research Institute.
63. "Sustainability and Markets", in R. Revesz, P. Sands and R. Stewart (eds) *Environmental Law, the Economy and Sustainable Development*. Cambridge University Press, 1999.
64. "National Income and the Environment" (with Bengt Kristrom). Plenary lecture, International Economic Association World Congress, Buenos Aires, 1999.
65. "New Strategies for the Provision of Global Public Goods: Learning from international environmental challenges." In *Global Public Goods*, published by Cambridge University Press in 1999 for the United Nations Development Program, edited by I Kaul and M. Stern.
66. "The Market and the Environment." In *Managing Human-Dominated Ecosystems*, Missouri Botanical Garden Press, edited by Peter Raven, 2001.
67. "Biosphere, Markets and Government". To be published in the proceedings of a conference on Market-Augmenting Government, sponsored by USAID.
68. "Valuing Ecosystem Services." *Ecosystems*, 2000, 3: 24-30.
69. "Biodiversity as a Commodity." *The Encyclopedia of Biodiversity*, eds S. Levin, J. Lubchenco, D. Tilman and G. Daily, Academic Press, 2000.
70. "Environmental Policy as Risk Management". In the *Economics of International Environmental Problems*, edited by Horst Siebert, Mohr Siebeck for Institut fur Weltwirtschaft an der Universitat Kiel.
71. "National Income", entry (with Bengt Kristrom) in the *Handbook of Environmental Economics*, Maler and Vincent eds, to be published in 2004 by Elsevier.
72. "Intertemporal Welfare Economics and the Environment", entry in the *Handbook of Environmental Economics*, Maler and Vincent eds, 2005, Elsevier.
73. "Valuing our Future: Cost-Benefit Analysis and Sustainability" in *Incentives Organization and Public Economics, Papers in Honour of Sir James Mirrlees*, Edited by Peter Hammond and Gareth Myles, Cambridge University Press, 2000.
74. "Environmental problems with a path to profit" *Financial Times*, October 30, 2000.

75. "The Economics of Sustainability", in *Sustainability and Growth*, edited by Carlo Cararro, Cambridge University Press.
76. "Biodiversity in the Marketplace." *World Economics*, Vol1 No. 4 October-December 2000.
77. "Environmental analysis: are we organized to confront deep uncertainty?" (with Kinzig, Carpenter, Dove, Levin, Lubchenco, Schneider and Starrett). *Ambio* 2003.
78. "Protecting Natural Capital Through Ecosystem Service Districts" Geoffrey Heal, Gretchen C. Daily, Paul R. Ehrlich, James Salzman, Carol Boggs, Jessica Hellmann, Jennifer Hughes, Claire Kremen, Taylor Ricketts. *Stanford Law Journal* 2002.
79. "Socially responsible investment," *Financial Times*, 2001.
80. "Uncertainty and Climate Change" (with Bengt Kristrom) In *Environmental and Resource Economics* 2003
81. "Optimality or sustainability" In *Festschrift for Joseph Stiglitz*, 2003, MIT Press
82. "Bundling Public and Private Goods"
83. "National Income in Dynamics Economies" (with Bengt Kristrom) Forthcoming in *Handbook of Environmental Economics*, editors Maler and Vincent, published by Elsevier.
84. "Are We Consuming Too Much?" (with Arrow Dasgupta Goulder et. al) in *Journal of Economic Perspectives* summer 2004.
85. "Genetic Diversity and interdependent crop choice in agriculture" (with Arrow Dasgupta Goulder Daily Ehrlich et. al) in *Resource and Energy Economics* 2003
86. "Bundling Biodiversity" *European Economic Review*
87. "Globalization and Biodiversity" in the *Global Governance: An Agenda for the World Economy*, Horst Siebert (editor), Springer Verlag.
88. "Coping with uncertainty", *Ambio*, 2005. (with K-G Maler, A. Kinzig, K. Arrow, P. Dasgupta et al.)
89. "The economics of biodiversity", in *Resource and Energy Economics* 2003.
90. "Environmental risks and financial institutions" *Economic Notes*, forthcoming.
91. "Arbitrage options and endangered species" to be published in *The Endangered Species Act at Thirty: Conserving Biodiversity in Human-Dominated landscapes*, Island Press 2006, Mike Scott and Frank Davis (eds).
92. "Agriculture and ecosystem services," (with A Small) in *Handbook of Agricultural Economics*, Elsevier, 2003, editor Gordon Rausser

93. "Corporate social responsibility – economic and financial perspectives" *Geneva Papers* 2005 30 387-409.
94. "Incentives to Reduce Tropical Deforestation" (with Kevin Conrad) *Journal of Forest Economics* vol 11 4 2006
95. "Valuing Ecosystem Services" *The Economists' Voice* January 2006 (with Ed Barbier)
96. "Exhaustible Resources" *The New Palgrave Dictionary of Economics*
97. "Accounting and the Resource Curse" in *Avoiding the Resource Curse* Macartan Humphreys, Jeffrey Sachs and Joe Stiglitz (Eds), Columbia University Press, 2007.
98. "A celebration of environmental and resource economics," *Review of Environmental Economics and Policy*, Vol 1 Number 1 Winter 2007 pp 7-25.
99. "Consumption, Investment and Future Well-Being: Reply to Daly et al." *Conservation Biology*, Vol. 21 No.5 1363-1365. (with Arrow, Daily, Dasgupta, Ehrlich, Goulder, Levin, Maler, Schneider, Starrett and Walker.)
100. "Distribution, Sustainability and Environmental Policy" Chapter 10 in *Handbook of Sustainable Development*, Giles Atkinson, Simon Dietz and Eric Neumayer (Eds), Edward Elgar, 2007, (with Bengt Kristrom)
101. "Corporate Social Responsibility: An Economic and Social Perspective", *The Geneva Papers*, 2005, 30,387-409
102. "Climate Economics: a Meta-Review and Some Suggestions for Further Research," *Review of Environmental Economics and Policy*, 2008, pp 1-19
103. "What do we know about the economics of climate change?" *Climatic Change*, 2009.
104. "Sustainable Fisheries", *Nature*, 23 Oct 2008, (with Wolfram Schlenker)
105. "National Income in a Dynamic Economy", *Economics Letters*, 98 2008 (with Bengt Kristrom, Umea Sweden)
106. "Corporate Environmentalism" forthcoming in *Environmental Economics and Policy Studies*
107. "Environmental Assets and Liabilities of the Federal Government" (with Howard Kunreuther, Wharton in *Assets and Liabilities of the Federal Government*, editor Deborah Lucas, NBER 2008.
108. "The Costs of Inaction with Respect to Biodiversity Loss". Presented at an OECD Ministerial meeting on the costs of environmental inaction, published in *Global Biodiversity: Conservation and Management Issues*, ICFAI Press.
109. "Doing Well by Being Green". Chapter 8 of *Is Growth Sustainable*, International Economic Association, (Heal, editor), Palgrave Press, 2009.

110. "Environmental Politics" in Kleindorfer and Michel-Kerjan (eds) *The Irrational Economist*, Wharton Press. 2009
111. "Investment and Emissions Control under Technology and Pollution Externalities," *Resource and Energy Economics* (with Nori Tarui of Hawaii) 2009
112. "The Prospects for Renewable Energy in the US." Published in *Review of Environmental Economics and Policy* 2009
113. "Social Reinforcement: Cascades, Entrapment and Tipping." *American Economic Journals: Micro* 2010 (with Howard Kunreuther, Wharton)
114. "Tipping Climate Negotiations" (with Howard Kunreuther of Wharton) Forthcoming in *Thinking about the Climate: Essays in Honor of Tom Schelling*, Oxford University Press
115. "Scientific Ambiguity and Climate Policy" (with Simon Dietz and Antony Millner), *Environmental and Resource Economics*, May 2013, vol 55, issue 1, pp 21-46
116. "What have we learned about development economics?" *Proceedings of ABCDE 2010* (Annual World Bank Conference on Development Economics)
117. "Facilitating Pareto-Optimal Subsidies by Co-ordination in Stochastic and Deterministic Settings" (With Min Gong, Howard Kunreuther, Elke Weber and David Krantz)
118. "The Value of Sea Lions" with Min Gong. Accepted subject to revision, *Environmental and Resource Economics*
119. "From Growth to Green Growth – a Framework" with Stephane Hallegatte, Marianne Fay and David Treuger, World Bank Working Paper.
120. "Perspectives on Sustainability" *Review of Environmental Economics and Policy*, 2011,
121. "Uncertainty and Decision in Climate Change Economics," (with Antony Millner), forthcoming, *Review of Environmental Economics and Policy*.
122. "Risk Management and Climate Change," (with Howard Kunreuther, Myles Allen, Ottmar Edenhofer, Christopher Field and Gary Yohe). *Nature Climate Change*, March 2013, 3, pp 447-450.
123. "Discounting under Disagreement" (with Antony Miller), June 2013, submitted *American Economic Review*.
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**Grants Received:**

Principle investigator on numerous grants from US National Science Foundation, UK Social Science Research Council, Electric Power Research Institute, Department of Energy, Sloan Foundation, NOAA and others.