

CURRICULUM VITAE

Randall A. Kramer

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Date of Birth: April 8, 1953
Knoxville, Tennessee

Education: Ph.D., Agricultural Economics, University of California, Davis, 1980
M.E., Economics, North Carolina State University, 1976
B.A., Economics, University of North Carolina, 1975

Current Position:

Professor of Environmental Economics, Nicholas School of the Environment and Earth Sciences, Duke University, (with secondary appointment in the Department of Economics). *Responsibilities:* teaching and research in resource and environmental economics, environmental policy analysis, and development economics.

Previous Experience:

Visiting Scholar, Business and Environment Initiative, IUCN – World Conservation Union, Gland, Switzerland, 2001-2002.

Associate Professor, Nicholas School of the Environment, Duke University, 1988-1996.

Visiting Economist, Directorate General of Forest Protection and Nature Conservation, Ministry of Forestry, Government of Indonesia, 1995-1996.

Visiting Fellow, Economic Growth Center, Yale University, 1987-1988.

Associate Professor, Department of Agricultural Economics, Virginia Polytechnic Institute and State University, 1985-1988.

Assistant Professor, Department of Agricultural Economics, Virginia Polytechnic Institute and State University, 1980-1985.

Post Graduate Research Agricultural Economist, University of California, Davis, 1978-1980.

Professional Societies:

Association of Environmental and Resource Economists
 American Economics Association
 American Agricultural Economics Association

Honorary Societies:

Phi Beta Kappa
 Phi Eta Sigma
 Gamma Sigma Delta
 Sigma Xi

Selected Professional Activities:

- 2004:** Advisor to the World Health Organization on Reporting of DDT Use under the Stockholm Convention on Persistent Organic Pollutants
- 2003-2004:** Center for Instructional Technology Faculty Fellow
- 2002-2005:** Chair, Environmental Economics and Policy Program, Nicholas School (and 1990-92, 1996-98)
- 2001-2004:** Consultant to the World Conservation Union (IUCN) on economic incentives for biodiversity conservation in Bulgaria and Romania
- 2001-2003:** Consultant to the World Bank Group on projects to encourage private sector biodiversity conservation in Tanzania and Mozambique.
- 1999-2000:** Chair, Division of Environmental Sciences and Policy, Nicholas School
- 1999-2005:** Board of Directors, Coral Reef Alliance
- 1998-2001:** Board of Directors, Association of Environmental and Resource Economists
- 1998-2005** Consultant to the World Bank Group on a project to establish ecotourism and sustainable financing for Komodo National Park, Indonesia.
- 1998:** Consultant to the Packard Foundation on the development of a marine and coastal biodiversity funding strategy.
- 1992-1995:** Director of Undergraduate Studies, Environmental Sciences and Policy Program, Duke University.
- 1994-1995:** Consultant to Winrock International and U.S. Agency for International Development for a report on the economics of biodiversity conservation in Africa.
- 1994:** Consultant to the National Research Council and World Bank to

participate in an economics panel at the U.N. Conference on Natural Disaster Reduction in Yokohama, Japan.

- 1992-1995:** Instructor in several World Bank short courses on environmental valuation.
- 1992:** Consultant to the Asian Development Bank on Pre-appraisal Mission for Indonesia Biodiversity Conservation Project.
- 1990-1991:** Consultant to the World Bank on the preparation of a global forest policy paper.
- 1989-1996:** Member, USDA Resource Policy Consortium.
- 1989-1995:** Member, Editorial Board, Journal of Sustainable Agriculture.
- 1987:** Consultant to U.S. Fish and Wildlife Service, Atlantic City, New Jersey, on economic analysis of commercial real estate development in wetlands area.
- 1986:** Consultant to U.S. Fish and Wildlife Service, Vicksburg, Mississippi, on economic alternatives for conserving privately owned forested wetlands.
- 1985-1988:** Consultant to U.S. Department of the Interior, Office of Policy Analysis, Washington, D.C., for economic analysis on a congressionally mandated study of the effects of federal policies on the preservation and development of wetlands.
- 1985:** Consultant to U.S. Agency for International Development to provide technical assistance on research and graduate instruction to the Post Graduate Institute of Agriculture, University of Peradenya, Sri Lanka.
- 1984:** Consultant to the Organization of American States, Washington, D.C. for preparation of manual on incorporating natural disaster information into benefit-cost analysis.
- 1984:** Testimony in Federal District Court (Lake Charles, Louisiana) in a lawsuit on the conversion of forested wetlands to farmland.
- 1982:** Consultant to International Food Policy Research Institute, Washington, D.C., for preparation of report on crop insurance programs.

Primary Research Interests:

Environmental and Resource Economics
 Benefit-Cost Analysis
 Agricultural Economics
 Environmental Policy Analysis

Economic Development
Health and Environment

Courses Taught:

Economics of Environmental Management
Economic Analysis of Environmental Policy
Resource and Environmental Economics
Advanced Environmental Economics
Social Science Surveys for Environmental Management
Environmental Social Science Research Methods
Introduction to Environmental Sciences and Policy
Resource and Environmental Policy
Seminar on Economic Valuation of the Environment
Seminar on Biodiversity Management
Seminar on Environmental Equity

Awards:

Duke University Scholar/Teacher of the Year, 2004
Outstanding Teacher of the Year, 1989 and 1998, Nicholas School of
the Environment

Books:

R.A. Kramer, C. van Schaik, and J. Johnson, editors, *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*, Oxford University Press, 1997.

Articles:

Ikuho Kochi, Bryan Hubbell, and Randall Kramer, "An Empirical Bayes Approach to Combining and Comparing Estimates of the Value of a Statistical Life for Environmental Policy Analysis, *Resource and Environmental Economics* (forthcoming)

Cassels, S., S. Curran, and R. A. Kramer. "Do Migrants Degrade Coastal Environments? Migration, Natural Resource Extraction, and Poverty in North Sulawesi, Indonesia." *Human Ecology* (forthcoming).

Saterson, K., N.L. Christensen, R.B Jackson, R.A. Kramer, S.L. Pimm, M.D. Smith, and J.B. Wiener, "Disconnects in Evaluating the Relative Effectiveness of Conservation Strategies, *Conservation Biology* 18 (2004): 597-599.

Pattanayak, S.K, E.O. Sills and R.A. Kramer, "Seeing the Forest for the Fuel," *Environment and Development Economics* 9 (2004): 155-179.

Pattanayak, S.K, E.O. Sills, A.D. Mehta, and R.A. Kramer, "Local Uses of Parks: Uncovering Patterns of Household Production from Forests of Siberut, Indonesia," *Conservation and Society* 1 (2003): 209-222.

R.A. Kramer and Sahat M.H. Simanjuntak, "Human Migration and Resource Use

In Sulawesi Fishing Communities,” pp. 739-740 in Proceedings of the Ninth International Coral Reef Symposium, Bali, Indonesia, 2000, Vol. 2, Published by the Indonesian Institute of Sciences, January 2003.

R. Kramer, T. Holmes and M. Haefele, “Contingent Valuation Estimation of Forest Ecosystem Protection,” E. Sills and K. Abt (eds.) *Forests in a Market Economy*. Kluwer Academic Publishers, Dordrecht, Netherlands, 2003.

R.A. Kramer and J.I. Eisen-Hecht, “Estimating the Economic Value of Water Quality in the Catawba River Basin,” *Water Resources Research* 38 (2002): 1-10.

R.A. Kramer, S.M.H. Simanjuntak, and Christopher Liese. “Migration and Fishing in Indonesian Coastal Villages,” *Ambio* 31(June 2002): 367-371.

T. Arin and R.A. Kramer, “Divers’ Willingness to Pay to Visit Marine Sanctuaries: An Exploratory Study,” *Ocean and Coastal Management* 45 (2002): 171-183.

R. Kramer, J.Langholz, and N. Salafsky, “The Role of the Private Sector in Protected Area Establishment and Management: A Conceptual Framework for Analyzing Effectiveness,” in *Making Parks Work: Strategies for Preserving Tropical Nature*, J.T. Terborgh, C. van Schaik, L. Davenport, and M. Rao, editors, Island Press, 2002.

J.I. Eisen-Hecht and R.A. Kramer. "A Cost-Benefit Analysis of Water Quality Protection in the Catawba Basin." *Journal of the Water Resources Association* 38(2002): 453-465.

S. K. Pattanayak and R. A. Kramer, "Worth of Watersheds: A Producer Surplus Approach for Valuing Drought Mitigation in Eastern Indonesia," *Environment and Development Economics* 6(2001): 123-146.

S. Pattanayak, and R. Kramer. "Pricing Ecological Services: Willingness to Pay for Drought Control Services in Indonesia," *Water Resources Research* 37 (2001): 771-778.

D. W. Reaves, R.A. Kramer, and T.P. Holmes, “Does Question Format Matter? Valuing an Endangered Species,” *Environmental and Resource Economics* 14(1999): 365-383.

J.E. Aldy, R.A. Kramer, and T.P. Holmes, “Environmental Equity and the Conservation of Unique Ecosystems: An Analysis of the Distribution of Benefits for Protecting Southern Appalachian Spruce-Fir Ecosystems,” *Society and Natural Resources* 12: (1999): 93-106.

R. Kramer and E. Mercer, “Valuing a Global Environmental Good: U.S. Residents’ Willingness to Pay to Protect Tropical Rain Forests,” *Land Economics*, 73 (1997): 196-210.

P. Shyamsundar and R.A. Kramer, “Biodiversity Conservation - At What Cost? A

Study of Households in the Vicinity of Madagascar's Mantadia National Park," *Ambio* 26(1997): 180-184.

R.A. Kramer, D. Richter, S. Pattanayak, and N. Sharma, "Ecological and Economic Analysis of Watershed Protection in Eastern Madagascar," *Journal of Environmental Management*, 49 (1997): 277-295.

R.A. Kramer and C.P. van Schaik, "Preservation Paradigms and Tropical Rain Forests," chapter 1 in R.A. Kramer, C. van Schaik, and J. Johnson, editors, *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*, Oxford University Press, 1997.

R.A. Kramer and N. Sharma, "Tropical Forest Biodiversity Protection: Who Pays and Why," chapter 8 in Kramer, C. van Schaik, and J. Johnson, editors, *Last Stand: Protected Areas and the Defense of Tropical and Biodiversity*, Oxford University Press, 1997.

P.J. Ferraro and R.A. Kramer, "Compensation and Economic Incentives: Reducing Pressure on Protected Areas," chapter 9 in R.A. Kramer, C. van Schaik, and J. Johnson, editors, *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*, Oxford University Press, 1997.

P. Shyamsundar and R.A. Kramer, "Tropical Forest Protection: An Empirical Analysis of the Costs Born by Local People," *Journal of Environmental Economics and Management*, 31 (1996): 129-144.

R.A. Kramer, E. Mercer, and N. Sharma, "Valuing Tropical Rain Forest Protection Using the Contingent Valuation Method," chapter 10 in W. L. Adamowicz, et al., editors, *Forestry, Economics and the Environment*, Wallingford, U.K.: CAB International, 1996.

T. Holmes and R.A. Kramer, "Contingent Valuation of Ecosystem Health," *Ecosystem Health* 2(1996): 56-60.

P.J. Parks, R.A. Kramer, and R. Heimlich, "Simulating Cost Effective Wetlands Reserves," *Natural Resources Modeling*, 9 (1995): 81-96.

T. Holmes and R. Kramer, "An Independent Sample Test of Yea-Saying and Starting Point Bias in Dichotomous-Choice Contingent Valuation," *Journal of Environmental Economics and Management*, 28 (1995): 121-132.

E. Mercer, R. Kramer, and N. Sharma, "Rain Forest Tourism — Estimating the Benefits of Tourism Development in a New National Park in Madagascar," *Journal of Forest Economics*, 1(1995): 239-269.

P. Parks and R. Kramer, "A Policy Simulation of the Wetlands Reserve Program," *Journal of Environmental Economics and Management*, 28 (1995): 223-240.

M. Zhu, D.B. Taylor, S.C. Sarin, and R.A. Kramer, "Chance Constrained Programming Models for Risk-Based Economic and Policy Analysis," *Agricultural*

and *Resource Economics Review* 23 (1994): 58-65.

K. Reichelderfer and R.A. Kramer, "Agricultural Resource Policy," chapter 10 in G.A. Carlson, D. Zilberman, and J.A. Miranowski, editors, *Agricultural and Environmental Resource Economics*, New York: Oxford University Press, 1993.

R.A. Kramer and L. Shabman, "The Effects of Agricultural and Tax Policy Reform on the Economic Return to Wetland Drainage in the Mississippi Delta Region," *Land Economics*, 69 (1993): 249-262.

R. Kramer and V. Ballabh, "Management of Common-Pool Forest Resources," in G.H. Peters and B.F. Stanton, editors, *Sustainable Agricultural Development: The Role of International Cooperation*, Brookfield, Vermont: Dartmouth Publishing Co, 1992.

Kramer, R. Healy, and R. Mendelsohn, "Forest Valuation," chapter 10 in Narendra Sharma, editor, *Managing the World's Forests*, World Bank Natural Resources Development Series, Arlington, VA.: Kendall Hunt, 1992.

N. Sharma, R. Rowe, M. Grut, R. Kramer and H. Gregerson, "Conditions for Sustainable Development," chapter 18 in Narendra Sharma, editor, *Managing the World's Forests*, World Bank Natural Resources Development Series, Arlington, VA.: Kendall Hunt, 1992.

S.M.M. Zuhair, D.B. Taylor, and R.A. Kramer, "Choice of Utility Functional Form: Its Effect on Classification of Risk Preferences and the Prediction of Farmer Decisions." *Agricultural Economics*, 6(1992): 333-344.

R.A. Kramer, A.L. Florey, and B.E. Utria, "Natural Hazard Risk Reduction in Project Formulation and Evaluation," chapter 2 in Steven O. Bender, editor, *Primer on Natural Hazard Management in Integrated Regional Development Planning*, Washington, DC: Organization of American States, 1991.

P.J. Parks and R.A. Kramer. "Costs of Wetlands Protection and Restoration Policies," in R.E. Heimlich, ed., *A National Policy of "No Net Loss of Wetlands,"* U.S. Department of Agriculture, Economic Research Service, Staff Report No. 9149, August 1991.

R.A. Kramer, "Decision Analysis as a Tool in Integrated Environmental Management," in *Integrated Environmental Management*, John Cairns, Jr, and Todd V. Crawford, editors, Chelsea, Michigan: Lewis Publishers, 1991.

J.M. Halstead, S.S. Batie, D.B. Taylor, C.D. Heatwole, P.L. Diebel, and R.A. Kramer, "Impacts of Uncertainty on Policy Costs of Managing Nonpoint Source Ground Water Contamination," *Journal of Sustainable Agriculture*, 1(1991): 29-48.

P.E. Norris and R.A. Kramer, "The Elicitation of Subjective Probabilities with Applications in Agricultural Economics," *Review of Marketing and Agricultural Economics*, 58(1990): 127-147.

J.M. Halstead, R.A. Kramer, and S.S. Batie. "Logit Analysis of Information in Animal Waste Management," *Production Agriculture*, 3(1990): 540-544.

R.A. Kramer and Minkang Zhu, "Strategies for Addressing Environmental Issues Associated with Agricultural Development, in China's Rural Development Miracle, John Longworth, editor, St. Lucia, Queensland: University of Queensland Press, 1989 (also published in Chinese).

R.A. Kramer and A.L. Grieco, "Consideration of Natural Disasters in the Economic Analysis of Agricultural Development Projects," in *Government Intervention in Agriculture: Cause and Effect*, B. Greenshields and M. Bellamy, editors, Brookfield, Vermont: Gower, 1989.

H. McDowell, R.A. Kramer, and J.M. Price. "An Analysis of U.S. Farm Income Policies: Historical, Market Determined, and Sector-Wide Stabilization." *Southern Journal of Agricultural Economics*, 21(1989): 1-20.

R.A. Kramer, "An International Overview of Soil Conservation Policy," in *Agriculture in a Turbulent World Economy*, Allen Maunder and Ulf Reuborg, editors, Brookfield, Vermont: Gower, 1987.

W.T. McSweeney, D.E. Kenyon, and R.A. Kramer, "Toward an Appropriate Measure of Uncertainty in a Risk Programming Model," *American Journal of Agricultural Economics*, 69(1987): 87-96.

R.A. Kramer and L. Shabman, "Incentives for Agricultural Development of the Nation's Wetlands: A Case Study of the Bottomland Hardwoods of the Lower Mississippi River Valley," chapter 6 in *Agriculture and the Environment*, T. Phipps, P. Crosson, and K. Price, editors, Washington, D.C.: Resources for the Future, 1986.

B.L. Gardner and R.A. Kramer, "Experience with Crop Insurance Programs in the United States," chapter 12 in *Crop Insurance for Agricultural Development*, P. Hazell, C. Pomareda, and A. Valdes, editors, Baltimore: Johns Hopkins University Press, 1986.

S.S. Batie, L.S. Shabman, and R.A. Kramer, "U.S. Agricultural and Natural Resource Policy: Past and Future," in *The Dilemmas of Choice*, K.A. Price, editor, Washington, D.C.: Resources for the Future, 1985. Also chapter 5 in *The Future of the North American Granary: Politics, Economics, and Resource Constraints in North American Agriculture*, C.F. Runge, editor, Ames: Iowa State University Press, 1986. Also published in Italian in *Scenari della Societa' e del Territorio*.

R.A. Kramer, W.T. McSweeney, and R.W. Stavros, "Soil Conservation with Uncertain Revenue and Input Supplies: Reply." *American Journal of Agricultural Economics*, 68(1986): 361-363.

W.T. McSweeney and R.A. Kramer, "The Integration of Farm Programs for

Achieving Soil Conservation and Nonpoint Pollution Control Objectives," *Land Economics*, 62(1986): 159-173.

R.A. Kramer, "Reexamining Agricultural Policy: Selected Issues and Alternatives," *American Journal of Agricultural Economics*, 68(1986): 1088-1095.

R.A. Kramer and R.D. Pope, "Participation in Farm Commodity Programs: A Stochastic Dominance Analysis: Reply." *American Journal of Agricultural Economics*, 68(1986): 189-190.

E. Segarra, R.A. Kramer, and D.B. Taylor, "A Stochastic Programming Analysis of the Farm Level Implications of Soil Erosion Control," *Southern Journal of Agricultural Economics*, 17(1985): 147-154.

C.R. Greene, R.A. Kramer, G.W. Norton, E.G. Rajotte, and R.M. McPherson, "An Economic Analysis of Soybean Integrated Pest Management," *American Journal of Agricultural Economics*, 67(1985): 567-572.

W.R. Kerns and R.A. Kramer, "Farmers' Attitudes Toward Nonpoint Pollution Control and Participation in Cost-Share Programs," *Water Resources Bulletin*, 21(1985): 207-215.

R.A. Kramer and S.S. Batie, "The Cross-Compliance Concept in Agricultural Programs from the New Deal to the Present," *Agricultural History*, 59(1985): 307-319.

R.A. Kramer, "Shifting Foundations of Agricultural Policy Analysis When Risk Markets are Incomplete: Discussion," *American Journal of Agricultural Economics*, 64(1985).

O. Capps, Jr. and R.A. Kramer, "Analysis of Food Stamp Participation Using Qualitative Choice Models," *American Journal of Agricultural Economics*, 67(1985): 49-59.

C.R. Greene, E.G. Rajotte, G.W. Norton, R.A. Kramer, and R.M. McPherson, "Revenue and Risk Analysis of Soybean Pest Management Options in Virginia," *Journal of Economic Entomology*, 78(1985): 10-18.

B.L. Gardner, R.E. Just, R.A. Kramer, and R.D. Pope, "Agricultural Policy and Risk," chapter 16 in *Risk Management in Agriculture*, P.J. Barry, editor, Ames: Iowa State University Press, 1984.

R.A. Kramer, W.T. McSweeney, W.R. Kerns, and R.W. Stavros, "An Evaluation of Alternative Policies for Controlling Agricultural Nonpoint Source Pollution," *Water Resources Bulletin*, 20(1984): 841- 846.

R.A. Kramer, "Crop Insurance as a Strategy for Agricultural Development," in *Rural Development: Growth and Equity*, B.L. Greenshields and Margot A. Bellamy, editors, Brookfield, Vermont: Gower, 1983.

R.A. Kramer, W.T. McSweeney, and R.W. Stavros, "Soil Conservation with Uncertain Revenues and Input Supplies," *American Journal of Agricultural Economics*, 65(1983): 694-702.

R.A. Kramer, "Federal Crop Insurance, 1938-1982," *Agricultural History*, 57(1983): 181-200.

R.A. Kramer and R.D. Pope, "Crop Insurance for Managing Risk," *Journal of the American Society of Farm Managers and Rural Appraisers*, 46(1982): 34-40.

R.A. March, R.A. Kramer, and L.L. Geyer, "Non-Point Source Water Pollution and Section 208 Planning: Legal and Institutional Issues," *Agricultural Law Journal*, 2(1981): 324-355.

R.A. Kramer and R.D. Pope, "Participation in Farm Commodity Programs: A Stochastic Dominance Analysis," *American Journal of Agricultural Economics*, 65(1981): 119-128.

R.D. Pope, R.A. Kramer, R.D. Green, and B.D. Gardner, "An Evaluation of Econometric Models of U.S. Farmland Prices," *Western Journal of Agricultural Economics*, 4(1979): 117-129.

R.D. Pope and R.A. Kramer, "Production Uncertainty and Factor Demands for the Competitive Firm," *Southern Economic Journal*, 46(1979): 489-501.

Monographs:

R. A. Kramer, S. Pattanayak, E. Sills, and S. Simanjuntak, *The Economics of the Siberut and Ruteng Protected Areas: Final Report*, Directorate General of Forest Protection and Nature Conservation, Government of Indonesia, Biodiversity Conservation Project in Flores and Siberut, Asian Development Bank Loan No. 1187-INO, August 1997, 109 pages.

R. Kramer, N. Sharma, and M. Munasinghe, editors, *Valuing Tropical Forests: Methodology and Case Study of Madagascar*, World Bank Environment Paper 13, Washington, D.C., 1995, 66 pages.

P.J. Ferraro and R.A. Kramer, *A Framework for Affecting Household Behavior to Promote Biodiversity Conservation*, Prepared for U.S. Agency for International Development, Africa Bureau, Environmental and Natural Resources Policy and Training Project (EPAT), Arlington, Virginia, June 1995, 41 pages.

R. Kramer, N. Sharma, P. Shyamsundar, and M. Munasinghe, "Cost and Compensation Issues in Protecting Tropical Rainforests: Case Study in Madagascar," World Bank, Environment Department Working Paper No. 62, Washington, D.C., 1994.

G.E. Groover, D.E. Kenyon, and R.A. Kramer, *An Evaluation of Production and Marketing Strategies for Eastern Virginia Cash Grain Producers*, Virginia Polytechnic Institute and State University, College of Agriculture and Life

Sciences, Virginia Agricultural Experiment Station Bulletin 89-1, 1989.

P.H. Gardner, G.W. Hoagland, and R.A. Kramer, *The Distribution of Benefits from the 1982 Federal Crop Programs*. U.S. Senate, Committee on the Budget, 98th Congress, 2d session, Senate Print 98-238, November 1984, 83 pages.

Research Contracts and Grants:

"Evaluating the Environmental and Health Impacts of Alternative Malaria Control Strategies," Duke Environmental Health Sciences Research Center, (with K. Saterson, J. Wiener, V. Fowler), 2004-2005, \$36,000.

"Economic Tools for Valuing and Managing Ecosystems: Improving Water Management in North Carolina," Environmental Defense, 2004, \$22,000.

"Toward an Improved Understanding of Wetland Restoration Choice Behavior of Landowners: A Hierarchical Bayes Approach, U.S. Department of Agriculture, National Research Initiative, 2003-2005, (with Joel Huber), \$115,000.

"Designing Programs to Improve Water Quality through Wetlands Restoration," North Carolina Water Resources Research Institute, 2003-2004, \$30,000.

"Meta Regression Analysis of Empirical Bayes Estimates of the Value of Statistical Life," U.S. Environmental Protection Agency, 2002-2003, \$40,000.

"Health and Environment in Rural Indonesia," Duke Center for Environmental Solutions, 2002-2003, (with S. Pattanayak and V. Fowler), \$10,000.

"Assessing Lanowners' Preferences for Different Wetlands Restoration Strategies in North Carolina," U.S. Forest Service (subcontract from the University of Georgia), 1999-2001, \$40,000.

"Migration, Fertility and Resource Use in Coastal Communities of North Sulawesi, Indonesia," John D. and Catherine T. MacArthur Foundation, (with S.M.H. Simanjuntak) 1998-2001, \$65,000.

"Selection of Wetland Restoration Sites in Rural Watersheds to Improve Water Quality: Integrating Ecological and Economic Approaches," U.S. Department of Agriculture, (with C. Richardson and N. Flanagan), 1998-2001, \$540,000.

"Economic Valuation of Water Quality in the Catawba River," Duke Energy Corporation, 1997-1999, \$153,000

"Economics of Biodiversity Conservation in Indonesia: Protected Areas on Flores and Siberut Islands," Chemonics International (subcontract from Asian Development Bank and the Government of Indonesia), 1995-1996, \$72,000.

"The Economics of Biodiversity Conservation in Indonesia," International Research Planning Grant, Office of the Provost, 1995-1996, \$6,000.

"Economic Valuation of Watershed Protection in Tropical Forests," Josiah Charles Trent Memorial Foundation (with S. Pattanayak), 1995-1996, \$1,500.

"Visualization Technologies in Environmental Curricula," National Science Foundation award to Sigma Xi, (with R. Bereman, T. Malone, D. Crawford-Brown, and L. Lee), 1994-1995, \$400,391 (including a \$44,544 subcontract to Duke).

"Working Conference on Tropical Biodiversity," The Howard Gilman Foundation (with J. Johnson and C. van Schaik), 1993, \$55,930.

"Methods for Ecotourism Market Assessment of the Atlantic Coastal Forests of Parana, Brazil," U.S. Forest Service, 1993-1994, \$32,000.

"The Economic Implications of Biodiversity Protection in Madagascar," World Wildlife Fund (with P. Shyamsundar), 1992-1993, \$15,000.

"Estimating Nonmarket Forest Benefits in the Southern Appalachian Mountains with Travel Cost Models," U.S. Forest Service, 1992, \$26,000.

"Economic Valuation of the Environmental Impacts of Development Projects," World Bank, 1991-1993, \$115,000.

"Designing Protective Buffer Zones for National Parks: The Case of the Mantadia National Park in Madagascar," Josiah Charles Trent Memorial Foundation (with P. Shyamsundar), 1991-1992, \$1,500.

"Biodiversity: Measuring, Monetizing, and Managing an Elusive Resource," Center for Tropical Conservation and U.S. Agency for International Development, (with Carel van Schaik), 1991-1994, \$110,000.

"Economic Valuation of Forested Ecosystem Damages Resulting from Hurricane Hugo," U.S. Forest Service, 1991-1993, \$43,000.

"Economic Valuation of the Environmental Impacts of Development Projects: Project Preparation," World Bank, 1990, \$22,000.

"Economic Analysis of a Proposed Agricultural Wetlands Reserve Program" (with Peter Parks), U.S. Department of Agriculture, 1990-1992, \$25,000.

"Economic Valuation of Forest Quality: Measurement and Assessment," U.S. Forest Service, 1990-1992, \$16,000.

"A Household Production Model of Developing Country Urban Fuelwood Demand and Supply," Josiah Charles Trent Memorial Foundation (with D.E. Mercer), 1989-1990, \$3,000.

"Economic Valuation of Forest Damage From Air Pollution: Method Development," U.S. Forest Service, 1989-1991, \$13,000.

"Management of Agricultural Nitrate Pollution of Surface and Ground Water," Virginia Department of Conservation and Historic Resources (with S.S. Batie, C.D. Heatwole, and T.A. Dillaha), 1987-1988, \$39,000.

"Effectiveness and Impacts of Agricultural BMPs Applicable to Virginia: A Comprehensive Assessment," Virginia Water Resources Research Center (with C.D. Heatwole, T.A. Dillaha, S. Mostaghimi, and F.B. Givens), 1987-1988, \$33,000.

"Economic and Legal Analysis of Strategies for Managing Agricultural Pollution of Groundwater," U.S. Geological Survey (with S.S. Batie and W.E. Cox), 1986-1988, \$118,000.

"Managing Environmental Risk: The Case of Agricultural Nonpoint Source Pollution of Groundwater," National Center for Food and Agricultural Policy, Resources for the Future (with S.S. Batie), 1985-1987, \$23,000.

"Evaluation of Federal Crop Insurance Based on Farmers' Subjective Probabilities," U.S. Department of Agriculture (with J.M. Moore), 1985-1987, \$77,000.

"Farmers' Conservation Behavior and Its Effects on Soil Productivity: An Application to the Piedmont Bright Leaf Erosion Control Area," U.S. Soil Conservation Service (with S.S. Batie and D.B. Taylor), 1983-1986, \$75,000.

"An Economic Evaluation of the Impacts of Reducing Non-point Pollution with Alternative Control Procedures on an Agricultural River Basin in Virginia," Virginia State Water Control Board (with W. Kerns), 1980-1982, \$68,000.