

## *Curriculum Vitae*

### **GEORGE B. FRISVOLD**

#### **Education**

- Ph.D., 1989 University of California, Berkeley, Agricultural and Resource Economics
- B.S., 1983 University of California, Berkeley, Political Economy of Natural Resources

#### **Professional Experience**

- 2002-13 **Professor and Extension Specialist**, Department of Agricultural & Resource Economics, The University of Arizona, Tucson, AZ
- 1997-2002 **Associate Professor and Extension Specialist**, Department of Agricultural & Resource Economics, The University of Arizona, Tucson, AZ
- 1996-97 **Branch Chief**, Resource and Environmental Policy Branch, Natural Resources & Environment Division, Economic Research Service, USDA, Washington, DC
- 1995-96 **Senior Economist**, President's Council of Economic Advisers, Executive Office of the President, Washington, DC
- 1994 **Lecturer**, Department of Geography and Environmental Engineering, G.W.C. Whiting School of Engineering, The Johns Hopkins University, Baltimore, MD
- 1989-95 **Agricultural Economist**, Resources and Technology Division, Economic Research Service, USDA, Washington, DC
- 1986-87 **Visiting Research Scholar**, Department of Extension and Technology Transfer, National Institute of Rural Development, Hyderabad, India

#### **Honors / Awards**

- 2007 Award presented by the Intergovernmental Panel on Climate Change for contributing to its award of the 2007 Nobel Peace Prize
- 1997 Society for Technical Communication, Technical Communication Award for Scholarly / Professional Articles for Day, K. and **G. Frisvold**. "Cooperative Research Bolsters War on Cancer." *Forum for Applied Research and Public Policy* 11(1996), 60-64.
- 1996 Letter of appreciation from President William Jefferson Clinton for economic analysis of Everglades restoration policies
- 1992 USDA Economic Research Service Administrator's Special Merit Award for Superior Service for Outstanding Publications on Public Research Investment
- 1992 USDA Certificate of Appreciation for Sustained Superior Performance and Contributions to the Resources and Technology Division
- 1991 USDA Certificate of Merit Award for Extraordinary and Exemplary Performance in the Program of the Resources and Technology Division

## Honors / Awards (continued)

- 1991 USDA Certificate of Merit Award for Mentoring Minority Employees
- 1991 USDA Certificate of Merit Award for Staff Analysis

## Service to Professional Organizations

- Chairperson of the Cotton and Economics Marketing Technical Conference of the Beltwide Cotton Conferences, 2010-11
- Vice-Chair of the Cotton and Economics Marketing Technical Conference of the Beltwide Cotton Conferences, 2009-10
- Editorial Board Member, *AgBioForum*, 2004-present
- Co-Editor, *Review of Agricultural Economics*, 2004-9
- American Agricultural Economics (AAEA) membership committee, 2005-8
- Co-Editor, *Journal of Agricultural and Resource Economics*, 2001-3
- Associate Editor, *American Journal of Agricultural Economics*, 2000-2
- Editorial Board Member, *Choices*, 1998-2000
- AAEA selection committee for Quality of Communications Award. Member. 1999

## Intramural Service

- Chair, Advisory Board, The Jimmye S. & Helen F. Hillman Endowment for the Exchange of Scholars, University of Arizona.
- Chair, Graduate Committee, Department of Agricultural & Resource Economics, University of Arizona.
- Member, Committee on Global Change. The Committee administers the University of Arizona's Ph.D. minor on Global Change.

## Publications

### Books

- [2] Colby, B & **G Frisvold** (eds.) (2011) *Adaptation and Resilience: The Economics of ClimateWater-Energy Challenges in the Arid Southwest*. Washington, DC: Resources for the Future Press. Volume co-editor and co-author of eight chapters.
- [1] **Frisvold, G** & B Kuhn. (eds.) (1999) *Global Environmental Change and Agriculture*. Northampton, MA: Edward Elgar. 1999.

### Journal Articles

- [52] Büyüktaktın, İE, Z Feng, AD Olsson, **G Frisvold**, & Ferenc Szidarovszky (2014) Invasive species control optimization as a dynamic spatial process: An application to buffelgrass (*Pennisetum ciliare*) in Arizona. *Invasive Plant Science and Management* 7 (In press).
- [51] Büyüktaktın, İE, Z Feng, **G Frisvold**, & F Szidarovszky (2013) Invasive species control based on a cooperative game. *Applied Mathematics* 4, 54–59.

- [50] **Frisvold, G** & S Deva (2013) Climate and choice of irrigation technology: implications for climate adaptation. *Journal of Natural Resources Policy Research* 5, 107–127.
- [49] **Frisvold, G** & K Konyar (2013) Climate change mitigation policies: Implications for agriculture and water resources. *Journal of Contemporary Water Research and Education* 150, 27–42.
- [48] **Frisvold, G** & T Marquez (2013) Water requirements for large-scale solar energy projects in the West. *Journal of Contemporary Water Research and Education*, 150, 106–116.
- [47] **Frisvold, G** & A Murugesan (2013) Use of weather information for agricultural decision making. *Weather, Climate & Society* 5, 55–69.
- [46] Norman, L, M Villarreal, R Niraula, T Meixner, **G Frisvold**, & W Labiosa (2013) Framing scenarios of binational water policy with a tool to visualize, quantify and value changes in ecosystem services. *Water* 5, 852–874.
- [45] **Frisvold, G** & S Deva (2012) Farm size, irrigation practices, and conservation program participation in the US Southwest. *Irrigation and Drainage* 61, 569–582.
- [44] **Frisvold, G.** & K Konyar (2012) Less water: How will agriculture in southern Mountain states adapt? *Water Resources Research* 48, W05534, doi:10.1029/2011WR011057.
- [43] Norsworthy, J, S Ward, D Shaw, R Llewellyn, R Nichols, T Webster, K Bradley, **G Frisvold**, S. Powles, N Burgos, W Witt, & M Barrett (2012) Reducing the risks of herbicide resistance: Best management practices and recommendations. *Weed Science* 60, 31–62.
- [42] Büyüktaktakın, İE, Z Feng, **G Frisvold**, F Szidarovszky, & A Olsson (2011) A dynamic model of controlling invasive species. *Computers & Mathematics with Applications* 62, 326–3333.
- [41] **Frisvold, G**, & J Reeves (2010) Resistance management and sustainable use of agricultural biotechnology. *AgBioForum* 13, 343–359.
- [40] Thompson, G, S Aradhyula, **G Frisvold**, & R Tronstad (2010) Does paying referees expedite reviews? Results of a natural experiment. *Southern Economic Journal* 76, 678–692.
- [39] **Frisvold, G**, A. Boor, & J Reeves (2009) Simultaneous diffusion of herbicide resistant cotton and conservation tillage. *AgBioForum*, 12, 249-257.
- [38] **Frisvold, G.**, T Hurley, & P Mitchell (2009) Adoption of best management practices to control weed resistance by corn, cotton, and soybean growers. *AgBioForum* 12, 370-381.
- [37] **Frisvold, G**, T Hurley, & P Mitchell (2009). Overview: Herbicide resistant crops—diffusion, benefits, pricing, and resistance management. *AgBioForum* 12, 244-248.

- [36] Hurley, T, P Mitchell, & **G Frisvold** (2009) Characteristics of herbicides and weed-management programs most important to corn, cotton, and soybean growers. *AgBioForum* 12, 269-280.
- [35] Hurley, T, P Mitchell, & **G Frisvold** (2009) Effects of weed resistance concerns and resistance management practices on the value of Roundup Ready® crops. *AgBioForum* 12, 291-302.
- [34] Hurley, T, P Mitchell, & **G Frisvold** (2009). Weed management costs, weed best management practices, and the Roundup Ready® weed management program. *AgBioForum* 12, 281-290.
- [33] Innes, R and **G Frisvold** (2009) The Economics of endangered species. *Annual Review of Resource Economics* 1, 485-512.
- [32] **Frisvold, G** and K Day-Rubenstein (2008) Bioprospecting and biodiversity conservation: What happens when discoveries are made? *Arizona Law Review* 50, 545-576.
- [31] **Frisvold, G** and J Reeves (2008) The costs and benefits of refuge requirements: The case of Bt cotton. *Ecological Economics* 65, 87-97.
- [30] **Frisvold, G**, J Reeves, & R Tronstad (2006) Bt cotton adoption in the United States and China: International trade and welfare effects. *AgBioForum* 9, 69-78.
- [29] Huffman, W, G Norton, G. Traxler, **G. Frisvold**, & J Foltz (2006) Winners and losers: Formula versus competitive funding of agricultural research. *Choices* 24, 269-274.
- [28] **Frisvold, G**, J Reeves, & R Tronstad (2006) Bt Cotton Adoption in the United States and China: International Trade and Welfare Effects. *AgBioForum* 9, 69-78.
- [27] **Frisvold G** (2004) How federal farm programs affect water use, quality, and allocation among sectors. *Water Resources Research* 40, (2004), W12S05.
- [26] Day-Rubenstein, K, P Heisey, C Klotz-Ingram, & **G Frisvold** (2003) Competitive grants and the funding of agricultural research in the U.S. *Review of Agricultural Economics* 25, 352-368.
- [25] **Frisvold, G**, J Sullivan, & A. Raneses (2003) Genetic improvements in major U.S. crops: The size and distribution of benefits. *Agricultural Economics* 28, 109-199.
- [24] **Frisvold, G** & D Osgood (2002) Ambos Nogales: A tale of two cities and water management on the U.S.-Mexico Border. *Journal of Law and Border Studies* 2, 7-36.
- [23] Day-Rubenstein, K & **G Frisvold** (2001) Genetic prospecting and biodiversity development agreements. *Land Use Policy* 18, 205-219.

- [22] **Frisvold, G**, K Fernicola, & M Langworthy (2001) Market returns, infrastructure and the supply and demand for extension services. *American Journal of Agricultural Economics* 83, 758-763.
- [21] **Frisvold, G** & D Osgood (2001) Financing wastewater collection and treatment on the U.S.-Mexico border. *Water Resources Update* 121, 40-49.
- [20] Day-Rubenstein, K, M Stuart, & **G Frisvold** (2000) Agricultural land use in tropical countries: Patterns, determinants, and implications for biodiversity loss. *World Resources Review* 12, 621-650.
- [19] **Frisvold, G** (2000) Data, information, and rural environmental policy: What will the next ten years bring? *Review of Agricultural Economics* 22, 238-45.
- [18] **Frisvold, G** & M Caswell (2000) Transboundary water management: Game-theoretic lessons for projects on the U.S.– Mexico border. *Agricultural Economics* 24, 101-111.
- [17] **Frisvold, G**, J Sullivan, & A Ranases (1999) Who benefits from genetic improvements in U.S. crops? *AgBioForum* 2, 226-35.
- [16] **Frisvold, G** & P Condon (1998) The Convention on Biological Diversity and agriculture: Implications and unresolved debates. *World Development* 26, 551-70.
- [15] Winters, P, R Murgai, A de Janvry, E Sadoulet, & **G Frisvold** (1998) Economic and welfare impacts of climate change on developing countries. *Environmental and Resource Economics* 12, 1-12.
- [14] **Frisvold, G**, K Fuglie, & C Klotz-Ingram (1998) Growth of private agricultural research. *Choices* 13, 22-3.
- [13] Day, K & **G Frisvold** (1996) Cooperative research bolsters war on cancer. *Forum for Applied Research & Public Policy* 11, 60-64.
- [12] Larson, B & **G Frisvold** (1996) Fertilizer use in Sub-Saharan Africa: What is needed and why. *Food Policy* 21, 509-525.
- [11] Larson, B & **G Frisvold** (1996) Uncertainty over future environmental taxes: Impacts on current investment in resource conservation. *Environmental & Resource Economics* 8, 461-471.
- [10] **Frisvold, G** & P Condon (1995) The Convention on Biological Diversity: Implications for agriculture. *Technological Forecasting and Social Change* 50, 41-54.
- [9] **Frisvold, G** & K Ingram (1995) Sources of agricultural productivity growth and stagnation in Sub-Saharan Africa. *Agricultural Economics* 13, 51-61.

- [8] Westenbarger, D & **G Frisvold** (1995) Air pollution and farm-level crop yields: An empirical analysis of corn and soybeans. *Agricultural and Resource Economics Review* 24, 156-165.
- [7] **Frisvold, G** (1994) Does supervision matter? Some hypothesis tests using Indian farm-level data. *Journal of Development Economics* 43, 217-238.
- [6] **Frisvold, G** & P Condon (1994) Biodiversity conservation and biotechnology development agreements. *Contemporary Economic Policy* 12, 1-9.
- [5] Westenbarger, D & **G Frisvold** (1994) Agricultural exposure to ozone and acid precipitation. *Atmospheric Environment* 28, 2895-2907.
- [4] Day, K & **G Frisvold** (1993) Medical research and genetic resources management: The case of taxol. *Contemporary Policy Issues* 11, 1-11.
- [3] Day, K & **G Frisvold** (1993) What Happened to Natural Resources and Environmental Research in the US? *Evolutionary Trends in Plants* 1, 1-4.
- [2] **Frisvold, G** (1991) Emerging issues in the allocation of public agricultural research funds. *American Journal of Agricultural Economics* 73, 876-881.
- [1] **Frisvold, G**, R Mines & J Perloff (1988) Effects of job site sanitation and living conditions on the health and welfare of agricultural workers. *American Journal of Agricultural Economics* 70, 873-885.

#### Chapters in Books and Monographs

- [29] Colby, B, **G Frisvold** & M Mealy (in press) Reallocating climate risks through water trading. In *Handbook of Water Economics*. J Roumasset (ed.) Dordrecht, The Netherlands: Springer.
- [28] **Frisvold, G** (in press) Herbicide resistant crops. In *Encyclopedia of Food and Agricultural Ethics*. P Thompson & D Kaplan (eds.) Dordrecht, The Netherlands: Springer.
- [27] **Frisvold, G** & J Reeves (in press) Herbicide resistant crops and weeds: Implications for herbicide use and weed management. In *Integrated Pest Management: Pesticide Problems, Vol. 3*. D Pimentel & R Peshin (eds.) Dordrecht, The Netherlands: Springer.
- [26] **Frisvold, G** & J Reeves (in press) IPM, Bt crops, and insecticide use: The U.S. experience. In *Integrated Pest Management: Experiences with Implementation, Vol. 4*. R Peshin & D Pimentel (eds.) Dordrecht, The Netherlands: Springer.

- [25] Hecht, S & **G Frisvold** (in press) Insurance and resilience to climate change. In *Warming to Climate Change: Adaptation in Places On The Edge*. C Bauer & L Gunderson (eds.) Tucson: University of Arizona Press.
- [24] **Frisvold, G**, L Jackson, J Pritchett, & J Ritten (2013) Agriculture and ranching. In *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, G Garfin, A Jardine, R Merideth, M Black, & S LeRoy (eds.) A report by the Southwest Climate Alliance. Washington, DC: Island Press.
- [23] **Frisvold, G** (2012) A social science perspective on weed management practices. In *National Summit on Strategies to Manage Herbicide-Resistant Weeds: Proceedings of a Symposium*. National Research Council (ed.) Washington, DC. National Academies Press.
- [22] **Frisvold, G** (2009) Can transgenic crops and IPM be compatible? In *Dissemination of IPM technology: Theory and Practice*. R Peshin (ed.) New York: Springer-Verlag.
- [21] **Frisvold, G** (2008) Strategic behaviour in transboundary water and environmental management. In *Game Theory and Policy Making in Natural Resources and the Environment*. A Dinar, J Albiac, J Sánchez-Soriano (eds.) London: Routledge.
- [20] **Frisvold, G**, R Tronstad, R Nichols, M Watson, & E. Hequet. Scope and economic impact of sticky cotton In *Sticky Cotton: Causes, Impacts, and Prevention*. E Hequet, T Henneberry & R Nichols (eds.) Washington, DC: USDA Agricultural Research Service.
- [19] **Frisvold, G** & K Emerick (2008) Rural-urban water transfers with applications to the U.S.-Mexico border region. In *Game Theory and Policy Making in Natural Resources and the Environment*. A Dinar, J Albiac, & J Sanchez-Soriano (eds.) New York: Routledge Press.
- [18] Morehouse, B, **G Frisvold**, & Bark-Hodgins (2007). How can tourism research benefit from multi-disciplinary assessments of climate change? Lessons from the US Southwest. In *Developments in Tourism Climatology*. A Matzarakis, CR de Freitas, & D. Scott (eds.) Freiburg: Commission on Climate, Tourism and Recreation, International Society of Biometeorology.
- [17] **Frisvold, G** (2006) Bt resistance management: The economics of refuges. In *Economics of Regulation of Agricultural Biotechnologies*. R Just, D Zilberman, & J Alston (eds.) Norwell, MA: Springer.
- [16] **Frisvold, G**, P Wilson, & R Needham (2006) Implications of federal farm policy and state regulation for agricultural water use. In *Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region*. B Colby & K Jacobs (eds.) Washington, DC: Resources for the Future Press.
- [15] **Frisvold, G**, R Tronstad, & J Reeves (2006) International impacts of Bt cotton adoption. In *International Trade and Policies for Genetically Modified Products*. R Evenson & V Santaniello (eds.) Wallingford, Oxfordshire, UK: CABI Publishing.

- [14] **Frisvold, G** (2005) Agriculture, federal farm programs and water use in the western United States. In *Negotiating Tribal Water Rights: Fulfilling Promises in the Arid West*. B Colby, J Thorson, & S Britton (eds.) Tucson: University of Arizona Press.
- [13] **Frisvold, G** & M Caswell (2002) Planning and financing water projects on the U.S.-Mexico border: The Economics of Cooperation. In *Both Sides of the Border: Transboundary Environmental Management Issues Facing Mexico and the United States*. L Fernandez & R Carson (eds.) Boston: Kluwer Academic Publishers.
- [12] **Frisvold, G** & R Tronstad (2002) Economic impacts of Bt cotton adoption in the United States. In *Economic and Environmental Impacts of Agbiotech: A Global Perspective*. N Kalaitzandonakes (ed.) New York: Kluwer-Plenum Academic Publishers.
- [11] **Frisvold, G** & J Hillman (2002) Inspection, quarantine and quality control. *Encyclopedia of Life Support Systems*. New York: UNESCO.
- [10] Erda, L, C Clemente, **G Frisvold**, K Minami, O Doering, N Sampson, P Waggoner (2000) Agricultural sector. In *Methodological and Technological Issues in Technology Transfer: A Special Report of IPCC Working Group III*. B Metz, O Davidson, J Martens, S van Rooijen, & L McGrory (eds.) Cambridge: Cambridge University Press.
- [9] **Frisvold, G** & S Vogel (2000) Financing agricultural research with prior distortionary taxes and subsidies. In *Public-Private Collaboration in Agricultural Research*. K Fuglie & D Schimmelpfennig (eds.) Ames, IA: Iowa State University Press. 2000.
- [8] Leones, J & **G Frisvold** (2000) Park planning beyond park boundaries: A Grand Canyon case study. In *National Parks and Rural Development: Practice and Policy in the United States*. G Machlis & D Field (eds.) Washington, DC: Island Press.
- [7] Winters, P, R Murgai, A de Janvry, E Sadoulet, & **G Frisvold** (1999) Climate change and agriculture: Effects on developing countries. In *Global Environmental Change and Agriculture*. Frisvold, G & B Kuhn (eds.) Northampton, MA: Edward Elgar.
- [6] **Frisvold, G** & D Schimmelpfennig (1998) Potential for sustainability and self-enforcement of trans-boundary water agreements. In *Conflict and Cooperation on Trans-Boundary Water Resources*. R. Just and S. Netanyahu (eds.) Norwell, MA: Kluwer Academic Publishers
- [5] Just, R, **G Frisvold**, V Harrison, J Oppenheimer, & D. Zilberman (1998) Using Bargaining Theory and Economic Analysis as an Aid to Trans-boundary Water Cooperation. In *Conflict and Cooperation on Transboundary Water Resources*. R. Just & S. Netanyahu (eds.) Norwell, MA: Kluwer Academic Publishers.
- [4] **Frisvold, G** (1997) Multimarket effects of agricultural research with technological spillovers. In *Global Trade Analysis*. Tom Hertel (ed.) Cambridge: Cambridge University Press.



- [3] **Frisvold, G** & M Caswell (1997) Transboundary water agreements and development assistance. In *Decentralization and Coordination in Water Resource Management*. D Parker & Y Tsur (eds.) Norwell, MA: Kluwer Academic Publishers.
- [2] Tsigas, M, **G Frisvold**, & B Kuhn (1997) Global climate change and agriculture. In *Global Trade Analysis*. Tom Hertel (ed.) Cambridge: Cambridge University Press. 1997.
- [1] **Frisvold, G** & M Caswell (1995) A bargaining model of water quality and quantity. In *Water Quantity / Quality Management and Conflict Resolution*. A Dinar & Edna Loehman (eds.) Westport, CT: Praeger.

#### Government Documents

- [9] Rubenstein, K, P Heisey, R Shoemaker, J Sullivan, & **G Frisvold** (2005). Crop Genetic Resources: An Economic Appraisal. *Economic Information Bulletin*. Number 2. Washington, DC: USDA, Economic Research Service.
- [8] (with Marius Schwarz & Michael Toman) (1996) Chapter 5, Economic Efficiency and Regulatory Reform. *Economic Report of the President 1996*. Washington, DC: U.S. Government Printing Office
- [7] Fuglie, K, K Day, **G Frisvold** & C Klotz (1995) Agricultural Research. *AREI Updates*. No. 5. Washington, DC: USDA, Economic Research Service.
- [6] **Frisvold, G**, J Yee, & K Day (1994) Private and Public Financing of R&D. *Agricultural Information Bulletin* No. 664-69. Washington, DC: USDA, Economic Research Service.
- [5] Ingram, K & **G Frisvold** (1994) Productivity in African agriculture: Sources of growth and stagnation. *International Agricultural and Trade Reports: Africa and Middle East Situation and Outlook Series*. Washington, DC: USDA, Economic Research Service.
- [4] **Frisvold, G** (1991) Endogenous Technological Change in U.S. Agriculture. A Direct Test of the Induced Innovation Hypothesis. *Technical Bulletin* No. 1790, Washington DC: USDA, Economic Research Service.
- [3] **Frisvold, G** & E Lomax (1991) Differences in Agricultural Research and Productivity Among 26 Countries. *Agricultural Economic Report*. Number 644. Washington DC: USDA, Economic Research Service.
- [2] Heck, W, D Ratloff, & **G Frisvold** (1991). Air quality and the productivity of crops and forests. In *Agriculture and the Environment: 1991 Yearbook of Agriculture*. Washington, DC: U.S. Government Printing Office.
- [1] Knudson, M & **G Frisvold** (1989) Patents may boost plant research. *Agricultural Outlook* AO-158, November, 25-6.