

**BONNIE G. COLBY, Ph.D.**  
***WATER AND NATURAL RESOURCE ECONOMICS***  
*Professor of Agricultural & Resource Economics*  
*The University of Arizona*

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**Areas of Professional Expertise**

Natural Resource and Agricultural Economics  
Valuation of Water Rights and Water-Related Assets and Natural Amenities  
Economic Aspects of Water Litigation, Negotiations and Agreements

**Education**

B.S., Agricultural Economics, University of California, Davis, 1978.  
M.S., Agricultural Economics, University of Wisconsin-Madison, 1980.  
Ph.D., Agricultural Economics, University of Wisconsin-Madison, 1983.

**Awards and Recognitions**

Western Agricultural Economics Association, Distinguished Scholar Award, 2007  
Faculty, Kinship Conservation Fellows Leadership Training Program, 2007-08  
Hillman Foundation Travel Awards for International Water Economics Research, 2000, 2008  
Mortar Board Society Citation Award for distinguished academic accomplishments, 2003.  
University of Arizona Provost's Author Support Fund Award, 2002.  
Faculty, Kennedy School of Government, Executive Training Program in Environmental Economics,  
Harvard University, 2000-01.  
Governor's Water Commission, Technical Team, State of Arizona, 2000-01.  
National Research Council, Committee on Upper Mississippi River Economic Analysis, 2000-02.  
President's Council on Sustainable Development, Western Regional Team, 1994-96  
National Research Council, Glen Canyon Environmental Studies Review Committee,  
1991-1995  
Fellow, Udall Center for Studies in Public Policy, 1991-1992  
Board of Directors, Western Network, 1991-1998  
Outstanding Research Scientist Award, The University of Arizona College of Agriculture, 1990  
National Academy of Sciences, Water Science and Technology Board, Committee on Western Water  
Management, 1989-1993  
Western Agricultural Economics Association, Best Published Research Award, 1987

## **Professional Appointments**

- 2000-01 Visiting Faculty, Kennedy School of Government, Executive Training Program in Environmental Economics, Harvard University
- 1983 - present Professor, Department of Agricultural Economics, The University of Arizona
- 1978 - 1983 Research and Teaching Assistant, University of Wisconsin
- 1977 - 1978 Policy Analyst, Directors Office, California Dept. of Food and Agriculture

## **Selected Research Grants and Projects: Water Resource Economics and Management**

- “Urban Supply Reliability Under Climate Change: Policy, Economics and Water Management”, PI, National Atmospheric and Oceanic Administration SARP Competitive Grant, 2007-10
- “Economic Considerations in Using Colorado River System Conservation to Replace Bypass Flow”, PI, Cooperative Agreement, US Bureau of Reclamation, 2007-09
- “Water Management Innovations: 25 Years of Tribal Water Settlements”, NSF Science and Technology Center, Semi-Arid Regions, 2005-06.
- “Enhancing Water Supply Reliability Through Improved Predictive Capacity And Response,” Co-PI on grant funded by U.S. Bureau of Reclamation, 2004-2010.
- “Economic Strategies to Address Climate-related Water Supply Variability”, Co-principal investigator on grant from National Atmospheric and Oceanic Administration, 2002-2012.
- “Evaluating the Economic and Environmental Effects of Alternative Dispute Resolution Processes”, grant from Hewlett Foundation and U.S. Environmental Protection Agency, 2003-2005.
- “Measuring the Economic Value of Desert Riparian Habitat, grant from SAHRA, NSF Science and Technology Center, Semi-Arid Regions, 2002-03.
- “The Economic and Legal Implications of Tribal Water Litigation and Negotiation in the Western U.S.”, grant funded by the U.S. Geological Survey, 2001-2002.
- “New Approaches to Resolving Water Conflicts,” grant from NSF Science and Technology Center, 2000-02.
- “Restoring and Maintaining Riparian Ecosystem Integrity”, Competitive Grant Award From The National Science Foundation/U.S. Environmental Protection Agency, 1999-2001.
- “Evaluating The Relative Effectiveness of Conflict Resolution Processes: Applications to Southwestern Water Conflicts,” Udall Center for Studies in Public Policy, 1996–98
- "Indian Water Rights: Negotiating The Future", Ford Foundation Grant, 1993-1995.
- "Coping With Severe, Sustained Drought in the Southwestern U.S.", Multi-state project supported by U.S. Geological Survey and U.S. Army Corps of Engineers, 1992-1994.
- "Nature Based Tourism and the Economy of Southern Arizona." Cooperative Research Project with Arizona Nature Conservancy, Arizona Dept. of Game and Fish, Arizona Office of Tourism, and Bureau of Land Management, 1992.
- "The Economic Value of Instream Flows in Northern New Mexico", Cooperative Project with Bureau of Land Management, 1992-1993
- "Dry Year Option Contracts as a Drought-Response Mechanism", U.S. Army Corps of Engineers Research Grant, 1991-1993.

"Water Management and Conservation in Western Irrigated Agriculture." Western Regional Project W-178. U.S. Department of Agriculture, 1985-1995.

"Instream Flows and Economic Development: Opportunities for the Wind River Reservation", Research Contract with Arapaho and Shoshone Tribes, Wind River Reservation, Wyoming, 1991.

"Economic Development and Water Use Alternatives for the Tohono O'Odham Nation." Research Contract with Tohono O'Odham Nation, 1991.

"Management of Conserved Water -- Market Development, Efficiency Gains and Distributive Consequences". U.S. Geological Survey Research Grant, 1990-1992.

"U.S. Water Values in Alternative Uses." U.S. Forest Service Research Contract, 1988-1989.

"Southwestern Water Markets as Indicators of Value", U.S. Dept. of Agriculture--Forest Service, Rocky Mountain Experiment Station Research Grant, 1984-1985.

### **Selected Papers and Publications: Water Resource Economics**

Colby, B. and G. Frisvold, *Risk and Resilience: The Economics Of Climate-Water-Energy Challenges In The Arid Southwest*, Resources for the Future Press, forthcoming, 2010.

Bark R.H., Colby B.G. and Dominguez F. Snow Days? Snowmaking adaptation and the future of low latitude, high elevation skiing in Arizona, USA. *Climatic Change*, 2009.

Colby B. and R. Bark (2009). Chapter 41: Inter-sectoral water trading as a climate change adaptation strategy, in *WATER RESOURCES PLANNING AND MANAGEMENT*, Editors Q. Grafton and K. Hussey, Cambridge University Press, 2009.

Bark R.H., Osgood D.E., Colby B.G., Katz G., and Stromberg J. Understanding preferences for environmental characteristics: can homebuyers distinguish between degraded greenspace and healthy habitat? *Ecological Economics*, 2008.

Colby, B. and J Pullen, "Influence of Climate Variability on the Market Price of Water in the Gila-San Francisco Basin." *Journal of Agric. and Resource Economics*, 2008

John Thorson, S. Britton and B.G. Colby. *Law, Economics and Policy: Essays on Tribal Water*. University of Arizona Press, 2007.

Colby, B.G., "Economic Aspects of Water Right Adjudications", *University of Denver Law Review*, 2007.

Bark-Hodgins R.H. and Colby B.G. An Economic Assessment of the Sonoran Desert Conservation Plan. *Natural Resources Journal*, 46(3):709-725, 2006.

R. Bark-Hodgins, D. Osgood and B. Colby, "Remotely Sensed Proxies For Environmental Amenities In Hedonic Analysis: What Does Green Mean?", in *Environmental Valuation: Intraregional And Interregional Perspectives*, Edited J. I. Carruthers and B. Mundy. Ashgate, 2006.

Colby, B.G. and Kathy Jacobs, *Water Policy for Urbanizing Arid Regions*, Resources for the Future Press, 2006.

Colby, B.G., John Thorson and Sarah Britton. *Negotiations Over Tribal Water Rights*. University of Arizona Press, 2005.

McCann, L. and Colby, B.G "Transaction Cost Measurement Related to Environmental and Natural Resource Policies", *Ecological Economics*, 2005.

Pullen, J. and B. Colby, "The Impact of Drought on Water Prices in the Southwestern United States," conference proceedings the Arizona Hydrological Society Symposium, September 2004, Tucson, Arizona

Pullen, J. and B. Colby, "Comparative Analysis of Drought Implications in the Colorado Big Thompson and Arizona Water Markets," conference proceedings for the Arizona Hydrological Society Symposium, September 2005, Flagstaff, Arizona

Ganderton, David Brookshire, Bonnie Colby and Mary Ewers, "Market Prices for Water in the Semi-Arid West", *Water Resources Research*, 2004.

Brookshire, D., B. Colby, M. Ewers, and P. Ganderton, "Water Markets in the Southwest, *Southwest Hydrology*, 2004.

Colby, B. G., "The Role of Markets in Reallocating Irrigation Water", chapter in *Encyclopedia of Water Science*, New York: Marcel Dekker, forthcoming in 2003.

Colby, B.G. "Economics of Urban Water Demand and Supply," chapter in *Managing Urban Water Demand*, N. Buras, editor, Kluwer Academic Publishers, 2003.

Colby, B. G. and Steve Wishart, "Quantifying the Influence of Desert Riparian Areas on Residential Property Values", *The Appraisal Journal*, July 2002.

Colby, B. G., "Resolving Interjurisdictional Disputes over Water and Environmental Quality," *Water Resources Update 118*: 20-28 , 2000.

Colby, B. G., "Evaluating Market Transactions, Litigation and Regulation as Tools for Implementing Environmental Restoration," *Arizona Law Review 42*: 381-394, 2000.

Leones, Julie, Bonnie Colby, Dennis Cory, and Liz Ryan "Measuring Regional Economic Impacts of Stream Flow Depletions," *Water Resources Research*, 33:831-838, 1997.

Booker, J. and Colby B.G. "Competing Water Uses in the Southwestern U.S.: Valuing Drought Damages," *Water Resources Bulletin 31*, pp. 877-888, 1995.

Colby, Bonnie G. "Applying Fair Market Value Concepts to Water Rights", *Real Estate Issues 18*: 8-14, 1993.

Colby, Bonnie G., K. Crandall and D. Bush. "Water Right Transactions, Market Values and Price Dispersion", *Water Resources Research 29*(1993):1565-1572.

Crandall, K., Bonnie Colby and K. A. Rait. "Valuing Riparian Preserves: A Southwestern Case Study", *Rivers 3*(1992):88-98.

Colby, Bonnie G. "Southwestern Water Values and Market Activity", *Appraisal Journal 59*(1991):488-500.

Colby, Bonnie G. "Alternative Approaches to Valuing Water Rights", *Appraisal Journal 57*(1989):180-196.

Colby, Bonnie G. "Estimating the Value of Water in Alternative Uses", *Natural Resources Journal 29*(1989):511-527.

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**Examples of Previous Water Economics Consulting Work**

Analyzing economic values for water in lower Colorado River Basin agriculture and in urban and industrial use, client: U.S. Department of Justice (*Arizona v California*).

Evaluating uses of water supplies in Missouri River Basin, client: Western Network, consultant to Fort Peck Assiniboine and Sioux Tribes.

Quantifying the economic value of water for municipal, industrial and agricultural use in ten U.S. Forest Service regions, encompassing the mainland United States, client: U.S. Forest Service.

Comparing the performance of six regional water markets, client: National Research Council.

Estimating economic returns to alternative water uses on tribal lands, clients: US Dept of Justice, Hopi Tribe, Hualapai Tribe, Colorado River Indian Tribes, Tohono O'Odham Nation, Wind River Arapaho and Shoshone Tribes.

Analyzing the economic impacts of water-based recreation in regional economy, clients: Wind River Arapaho and Shoshone Tribes.

Designing new regional water market mechanisms to accommodate urban development and endangered species water needs, State of Texas, client: large urban water purveyor.

Identifying mechanisms to acquire water for fish, wildlife and water quality needs, client: U.S. EPA.

Analyzing the effectiveness of water transactions in Nevada, client: municipal water supplier.

Developing and presenting workshop for judges and water masters on economic methodologies used in water right proceedings, client: foundation-supported professional development program for judges and water masters.

Valuing water rights and alternative water supplies in support of water settlement negotiations, client: consortium of tribal governments, New Mexico *Aamodt* case.

Valuing alternative water uses and supply alternatives in Oregon, client: inter-agency federal project.

Valuing water rights in support of client hearings before Internal Revenue Service, clients: private firms.

Valuing water-related assets involved in condemnation proceedings; State of Washington, client: consortium of municipalities.

Economic expertise in support of designing a demonstration program for voluntary water transactions with senior agricultural water users, client: US Bureau of Reclamation.

Economic expertise in support of client's voluntary water acquisition program and for condemnation proceedings; State of New Mexico, client: law firm representing regional water authority.