

KENNETH A. BAERENKLAU, PH.D.
ASSOCIATE PROVOST & CHIEF OF STAFF
PROFESSOR OF ENVIRONMENTAL ECONOMICS & POLICY
UNIVERSITY OF CALIFORNIA, RIVERSIDE

EDUCATION

- Ph.D. Agricultural & Applied Economics, University of Wisconsin – Madison, 2002
Major field: Environmental and Natural Resource Economics; Minor field: Quantitative Methods
- M.S. Civil Engineering, Stanford University, 1995
Major Field: Environmental Engineering and Science
- B.S. Civil Engineering, Stanford University, 1993
Specialization: Environmental Engineering

AREAS OF SCHOLARLY EXPERTISE

- Water resource economics
- Non-point source pollution control
- Conservation technology adoption
- Non-market valuation
- Mathematical and statistical programming

HONORS, AWARDS & APPOINTMENTS

- Editorial Board member, *Water Economics and Policy*, 2014-2023
- Adjunct Fellow, Public Policy Institute of California, 2015-19
- Associate Editor, *Water Resources Research*, 2016-18
- Alumnus, Academy for Innovative Higher Education Leadership, 2016-17
- Six Experts to Watch on the Economics of California Water, *News Deeply* 2016
- Editorial Board member, *Land Economics*, 2009-16
- Editorial Council member, *Journal of Environmental Economics and Management*, 2009-12
- Outstanding Ph.D. Dissertation (Honorable Mention), American Agricultural Economics Assn., 2003
- Henry C. Taylor Doctoral Dissertation Award, Department of Agricultural & Applied Economics, University of Wisconsin – Madison, 2003
- University Dissertator Fellowship, University of Wisconsin – Madison, 2001-02
- Wisconsin Agricultural and Life Sciences Alumni Association travel fellowship, University of Wisconsin – Madison, 2001
- Science to Achieve Results Fellowship, United States Environmental Protection Agency, 1998-2001
- Vilas Professional Development Fellowship, University of Wisconsin – Madison, 1999
- Wisconsin Alumni Research Foundation Fellowship, University of Wisconsin – Madison, 1996-97
- Shell Foundation Fellowship, Department of Civil Engineering, Stanford University, 1993

EMPLOYMENT

University of California, Riverside, 2015-present.

Associate Provost & Chief of Staff. Campus leader who serves as a cabinet member for both the Chancellor and the Provost & Executive Vice Chancellor. Responsible for leading a variety of strategic, institutional, and academic planning efforts; coordinating faculty hiring and student success initiatives; assisting with capital planning, campus budgeting, and enrollment management; leading campus-level assessment activities and serving as the campus Accreditation Liaison Officer; supervising the UCR Palm Desert Center; liaising with deans, vice chancellors, and the Academic Senate; and working with the Provost & Executive Vice Chancellor on a range of issues both internal and external to the campus.

University of California, Riverside, 2002-present.

Assistant (2002-08), Associate (2008-20) and Full Professor (2020-present) of Environmental Economics and Policy. Appointed in the Department of Environmental Sciences from 2002-14 and in the School of Public Policy from 2014-present.

University of California, Riverside, 2022-23.

Vice Provost and Dean for Undergraduate Education (interim). Supervised 110 professional staff and an annual budget of \$25M in support of instructional innovation, student success programs, high impact practices, and the campus writing program. Reorganized to expand academic leadership, secured additional campus funding, hired new student success professionals, drafted a strategic plan, initiated enhancements to academic advising, and raised donor funds for student programming.

University of California, Riverside, 2008-12.

Associate Dean for Graduate Academic Affairs. Managed graduate student academic affairs including student employment, academic integrity, petitions, and grievances. Collaboratively developed new graduate student success programs and initiated new student outcomes assessment methods.

Booz-Allen & Hamilton, Inc., Energy & Chemicals Group, 1995-96.

Management Consultant. Provided management consulting services to corporations in the energy, chemicals, pharmaceuticals and natural resource industries.

Arthur Andersen & Co., Environmental Services Practice, 1995.

Management Consultant. Provided management consulting and financial services to corporations in the forest products and consumer electronics industries.

Canonie-Smith Environmental Services Corp., 1993 and 1994.

Engineering Intern. Designed soil and groundwater remediation systems for hazardous waste sites.

SCHOLARLY PUBLICATIONS

Pérez-Urdiales, M., and K.A. Baerenklau. 2020. "Assessing the Impacts of Urban Water-Use Restrictions at the District Level: Case Study of California's Drought Mandate." *Journal of Water Resources Planning and Management* 146(5): 05020004. doi: 10.1061/(ASCE)WR.1943-5452.0001169.

Sanchez, J., K.A. Baerenklau and A. González-Cabán. 2020. "How Sensitive are Estimates of Wilderness Recreation Values to Information about Hiking Destinations?" *Journal of Forest Economics* 35(1): 19-41. <http://dx.doi.org/10.1561/112.00000447>

Pérez-Urdiales, M., and K.A. Baerenklau. 2019. "Learning to live within your (water) budget: evidence from allocation based rates." *Resource & Energy Economics* 57: 205-221. doi: 10.1016/j.reseneeco.2019.06.002.

Pérez-Urdiales, M., and K.A. Baerenklau. 2019. "Additional effects of rebate programs in the residential water sector: indoor vs outdoor." *Water*, doi: 10.3390/w11061170.

Baerenklau, K.A. and M. Pérez-Urdiales. 2019. "Can Allocation-Based Rates Promote Water Conservation and Increase Welfare? A California Case Study." *Water Economics and Policy*, doi: 10.1142/S2382624X18500145.

Zhang, B., K.H. Fang, and K.A. Baerenklau 2017. "Have Chinese water pricing reforms reduced urban residential water demand?" *Water Resources Research* 53: 5057-5069. doi: 10.1002/2017WR020463.

Sanchez, J., K.A. Baerenklau, and A. González-Cabán. 2016. "Valuing hypothetical wildfire impacts with a Kuhn-Tucker model of recreation demand." *Forest Policy and Economics* 71: 63-70.

Baerenklau, K.A., T.P. Tomich, S. Daroub, V.R. Haden, C. Kling, T. Lang, C.-Y. Lin, C. Mitterhofer, D. Parker, T. Rosenstock, K. Schwabe, and J. Wang. 2016. "Responses: Policies and Institutions." Chapter 8 in The California Nitrogen Assessment, T.P. Tomich, S.B. Brodt, R.A. Dahlgren and K.M. Scow (eds.). University of California Press.

Marcos-Martínez, R., and K.A. Baerenklau. 2015. "Controlling for Misclassified Land Use Data: a Post-Classification Latent Multinomial Approach." *Remote Sensing of Environment* 170: 203-215.

Baerenklau, K.A., and J. Wang. 2015. "Model-Based Regulation of Nonpoint Source Emissions." Chapter 17 in Handbook of Water Economics, A. Dinar and K. Schwabe (eds.). Edward Elgar.

Schwabe, K.A., K.A. Baerenklau and A. Dinar. 2014. "Coping with Water Scarcity." *Policy Matters* 6(1).

Baerenklau, K.A., K.A. Schwabe and A. Dinar. 2014. "Allocation-Based Water Pricing Promotes Conservation while Keeping User Costs Low." *Agricultural and Resource Economics Update* 17(6): Jul/Aug.

Wang, J., and K.A. Baerenklau. 2014. "How Inefficient are Nutrient Application Limits? A Dynamic Analysis of Groundwater Nitrate Pollution from CAFOs." *Applied Economics Perspectives and Policy* 36(4), doi: 10.1093/aepp/ppu023.

Baerenklau, K.A., K.A. Schwabe, and A. Dinar. 2014. "Residential Water Demand Effect of Increasing Block Rate Water Budgets." *Land Economics* 90(4): 683-699.

Wang, J., and K.A. Baerenklau. 2014. "Crop Response Functions Integrating Water, Nitrogen, and Salinity." *Agricultural Water Management* 139:17-30.

Baerenklau, K.A. 2014. "Nonpoint Source Pollution." In Environmental and Natural Resource Economics: An Encyclopedia, J. Whitehead and T. Haab (eds.). Greenwood/Praeger.

Knapp, K.C., K.A. Schwabe and K.A. Baerenklau. 2014. "Regional Economics and Management in Closed Drainage Basins." Chapter 14 in Salinity and Drainage in San Joaquin Valley, California: Science, Technology and Policy, A.C. Chang and D. Brawer Silva (eds.). Springer: Dordrecht, The Netherlands.

Baerenklau, K.A., E.A. Ellis, and R. Marcos-Martínez, 2012. "Economics of land use dynamics in two Mexican coffee agroforests: implications for the environment and inequality." *Investigación Económica* LXXI (279): 93-124.

Baerenklau, K.A., 2010. "A Latent Class Approach to Modeling Endogenous Spatial Sorting in Zonal Recreation Demand Models." *Land Economics* 86(4): 800-816.

Ellis, E.A., K.A. Baerenklau, R. Marcos-Martínez, and E. Chávez, 2010. "Land use/land cover change dynamics and drivers in a low-grade marginal coffee growing region of Veracruz, Mexico." *Agroforestry Systems* 80: 61-84, doi: 10.1007/s10457-010-9339-2.

Baerenklau, K.A., A. González-Cabán, C. Paez, and E. Chávez, 2010. "Spatial Allocation of Forest Recreation Value." *Journal of Forest Economics* 16: 113-126.

- Baerenklau, K.A., Cutter, W.B., A. DeWoody, R. Sharma and J. Lee, 2008. "Capturing Urban Stormwater Runoff: A Decentralized Market-Based Alternative." *Policy Matters* 2(3): 1-14.
- Cutter, W.B., K.A. Baerenklau, A. DeWoody, R. Sharma, and J. Lee, 2008. "Costs and Benefits of Capturing Urban Runoff with Competitive Bidding for Decentralized BMPs." *Water Resources Research* 44, W09410, doi:10.1029/2007WR006343.
- Baerenklau, K.A., N. Nergis and K. Schwabe, 2008. "Effects of Nutrient Restrictions on Confined Animal Facilities: Insights from a Structural Model." *Canadian Journal of Agricultural Economics* 56(2): 219-241.
- Schwabe, K.A., P.W. Schuhmann, K.A. Baerenklau, and N. Nergis, 2008. "Fundamentals of Estimating the Net Benefits of Ecosystem Preservation: The Case of the Salton Sea." *Hydrobiologia* 604: 181-195. Reprinted in The Salton Sea Centennial Symposium (pp.181-95), S. Hurlbert (ed.). Springer: Dordrecht, The Netherlands.
- Baerenklau, K.A. and K.C. Knapp, 2007. "Dynamics of Agricultural Technology Adoption: Age Structure, Reversibility and Uncertainty." *American Journal of Agricultural Economics* 89(1): 190-201.
- Knapp, K.C. and K.A. Baerenklau, 2006. "Groundwater Quantity and Quality Management: Agricultural Production and Aquifer Salinization over Long Time Scales." *Journal of Agricultural and Resource Economics* 31(3): 616-641.
- Baerenklau, K.A. and B. Provencher, 2005. "Static Modeling of Dynamic Recreation Behavior: Implications for Prediction and Welfare Estimation." *Journal of Environmental Economics and Management* 50(3): 617-636.
- Provencher, B and K.A. Baerenklau, 2005. "An Exposition of Structural Estimation of Discrete Dynamic Decision Processes." Chapter 15 in Applications of Simulation Methods in Environmental and Resource Economics, R. Scarpa and A. Alberini (eds.). Springer: Dordrecht, The Netherlands.
- Baerenklau, K.A., 2005a. "Some Simulation Results for a Green Insurance Mechanism." *Journal of Agricultural and Resource Economics* 30(1): 94-108.
- Baerenklau, K.A., 2005b. "Toward an Understanding of Technology Adoption: Risk, Learning and Neighborhood Effects." *Land Economics* 81(1): 1-19.
- Baerenklau, K.A., 2004. "Simulating the Effects of a Green Payment Program on the Diffusion Rate of a Conservation Technology." *Agricultural and Resource Economics Review* 33(1): 121-137.
- Baerenklau, K.A., 2002. "Green Payment Programs for Nonpoint Source Pollution Control: How Important is Targeting for Cost-Effectiveness?" *Journal of Agricultural and Resource Economics* 27(2): 406-419.
- Provencher, B., K.A. Baerenklau and R.C. Bishop, 2002. "A Finite-Mixture Logit Model of Recreational Angling with Serially Correlated Random Utility." *American Journal of Agricultural Economics* 84(4): 1066-1075.
- Stumborg, B.E., K.A. Baerenklau and R.C. Bishop, 2001. "Nonpoint Source Pollution and Present Values: A Contingent Valuation Study of Lake Mendota." *Review of Agricultural Economics* 23(1): 120-132.

TECHNICAL REPORTS AND PROCEEDINGS

Mount, J., E. Hanak, K. Baerenklau, V. Butsic, C. Chappelle, A. Escrive-Bou, G. Fogg, G. Gartrell, T. Grantham, B. Gray, S. Green, T. Harter, D. Jassby, J. Jezdimirovic, Y. Jin, J. Lund, H. McCann, J. Medellín-Asuara, D. Mitchell, P. Moyle, A. Rhoades, K. Schwabe, N. Seavy, S. Stephens, D. Swain, L. Szeptycki, B. Thompson, P. Ullrich, J. Viers, and Z. Xu. 2018. "Managing Drought in a Changing Climate: Four Essential Reforms." Public Policy Institute of California.

Schwabe, K.A., K.A. Baerenklau, M. Pérez-Urdiales, and Y. Xiong. 2017. "Water Conservation Study – Phase III Summary Report." Report to Moulton Niguel Water District. September. School of Public Policy, University of California, Riverside.

Mitchell, D., E. Hanak, K. Baerenklau, A. Escrive-Bou, H. McCann, M. Pérez-Urdiales, K. Schwabe. 2017. "Building Drought Resilience in California's Cities and Suburbs. Public Policy Institute of California."

M. Pérez-Urdiales, K. Baerenklau, K. Schwabe, D. Mitchell. 2017. "Building Drought Resilience in California's Cities and Suburbs: Technical Appendix C: Water Use Patterns and Trends within the Service Areas of California Water Service." Public Policy Institute of California.

A. Escrive-Bou, D. Mitchell, K. Baerenklau, E. Hanak, H. McCann, M. Pérez-Urdiales, K. Schwabe. 2017. "Building Drought Resilience in California's Cities and Suburbs: Technical Appendix A: Urban Water Use Patterns and Trends in California from 2013 to 2016." Public Policy Institute of California.

Schwabe, K.A. and K.A. Baerenklau, 2017. "Water Conservation Study – Phase II Summary Report." Report to Moulton Niguel Water District. February. School of Public Policy, University of California, Riverside.

Hanak, E., K. Baerenklau, C. Chappelle, B. Gray, J. Lund, D. Mischynski, K. Jessoe, D. Mitchell. 2016. "Paying for Water." In California's Water. San Francisco. Public Policy Institute of California.

Hanak, E., K. Baerenklau, A. Escrive-Bou, J. Lund, K. Schwabe, N. Ajami, J. DeShazo, D. Mitchell, J. Saphores, D. Sedlak, C. Wichman. 2016. "Water for Cities." In California's Water. San Francisco. Public Policy Institute of California.

Schwabe, K.A. and K.A. Baerenklau, 2016. "Water Conservation Study – Phase I Summary Report." Report to Moulton Niguel Water District. March. School of Public Policy, University of California, Riverside.

Baerenklau, K.A., D. Jenerette and K. Schwabe. 2015. "Assessing the Effects of Local Water District Policies on Urban Forests and their Implications Across Socioeconomic Groups." Report to U.S. Forest Service Pacific Southwest Research Station. September. School of Public Policy, University of California, Riverside.

Hanak, E., J. Lund, N. Ajamil, K. Baerenklau, J.R. DeShazo, J.D. Saphores, K. Schwabe, D. Sedlak, 2015. "Water for Cities." In California's Water. San Francisco. Public Policy Institute of California.

Case III, H.L., J. Boles, A. Delgado, T. Nguyen, D. Osugi, D.A. Barnum, D. Decker, S. Steinberg, S. Steinberg, C. Keene, K. White, T. Lupo, S. Gen, K.A. Baerenklau. 2013. "Salton Sea ecosystem monitoring and assessment plan." U.S. Geological Survey Open-File Report 2013-1133. California Department of Water Resources. 220p.

Sanchez, J., K.A. Baerenklau, A. González-Cabán, K.A. Schwabe, 2013. "Economics of Forest Fire Management: Spatial Accounting of Costs and Benefits." Proceedings of the Fourth International Symposium on Fire Economics, Planning and Policy: Climate Change and Wildfires. Mexico City, Mexico. Gen. Tech. Rep. PSW-GTR-245. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

Baerenklau, K.A., K.A. Schwabe, and A. Dinar, 2013. "Eastern Municipal Water District Water Pricing Study - Final Report." Report to Eastern Municipal Water District. April. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., K.A. Schwabe, and A. Dinar, 2013. "Eastern Municipal Water District Water Pricing Study - Interim Final Report #2." Report to Eastern Municipal Water District. February. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., K.A. Schwabe, and A. Dinar, 2012. "Eastern Municipal Water District Water Pricing Study - Interim Final Report #1." Report to Eastern Municipal Water District. October. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., 2010. "Review of 'A Study of the Economic Value of Public Beach Land in Solana Beach' by CIC Research, Inc." Report to the Surfrider Foundation. June. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., A. González-Cabán, C.I. Paez, and E. Chávez, 2009. "A GIS-based Framework for Evaluating Investments in Fire Management: Spatial Allocation of Recreation Value." Pp. 304-313 in Proceedings of the third international symposium on fire economics, planning, and policy: common problems and approaches. Gen. Tech. Rep. PSW-GTR-227. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

Schwabe, K.A., K.A. Baerenklau and K.C. Knapp, 2008. "Groundwater salinity management in California's Central Valley: a common property evaluation." Proceedings of the 2nd International Salinity Forum. Australian Government, Department of Agriculture, Fisheries, and Forestry.

Cutter, W.B. and K.A. Baerenklau, 2007. "Implementing the Los Angeles River Metals TMDL through Financial Incentives: A Sun Valley Case Study." Report to the City of Los Angeles, Dept. of Public Works. June. Department of Environmental Sciences, University of California, Riverside.

K2 Economics, 2007. "A Preliminary Investigation of the Potential Non-Market Benefits Provided by the Salton Sea." Report to the Salton Sea Authority. January. Riverside, CA. Prepared by K.A. Schwabe and K.A. Baerenklau.

Baerenklau, K.A. and W.B. Cutter, 2006. "Incentives for Voluntary Installation of Stormwater BMPs." Report to the City of Los Angeles, Department of Public Works. December. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., 2006. "Synthesis of Economic Valuation Studies of Forest Landscape Disturbances." Report to the United States Forest Service, Forest Biomass Energy Life Cycle Assessment Project Team. June. Department of Environmental Sciences, University of California, Riverside.

Baerenklau, K.A., 2005. "Cost-effectiveness of the Conservation Reserve Program: Discussion." Proceedings of the Annual Meetings of the American Agricultural Economics Association. *American Journal of Agricultural Economics* 87(5): 1256-1257.

Global Sustainable Systems Research, 2003. "An Analysis of the Cost-Effectiveness of Future Compliance with Proposed 2007 Emission Limits for Distributed Generation." Report to the Energy Foundation. September. Riverside, CA. Prepared by N. Nikkila, K. Davidson, E. Garvey, K. Schwabe, K. Baerenklau, and J. Lents.

PROFESSIONAL SERVICE – SELECTED

- Reviewer for *Journal of Environmental Economics and Management*, *Land Economics*, *Journal of Public Economics*, *American Journal of Agricultural Economics*, *Environmental & Resource Economics*, *Journal of Agricultural and Resource Economics*, *Resource and Energy Economics*, *Water Resources Research*, *Journal of Agricultural Economics*, *Journal of Agricultural & Applied Economics*, *Review of Agricultural Economics*, *Agricultural and Resource Economics Review*, *Australian Journal of Agricultural and Resource Economics*, *Agricultural Water Management*, *Journal of Environmental Management*, *Review of International Economics*, *Forest Policy and Economics*, *Journal of Water Resources Planning and Management*, *Water Science and Technology*, *Water Resources and Economics*, *Water Policy*, *Environmental Science and Technology*, *Water Economics and Policy*, *Journal of Policy Analysis and Management*, National Institutes for Water Resources, United States Environmental Protection Agency, and United States-Israel Binational Agricultural Research and Development Fund.
- Past or current member of American Economic Association, Agricultural and Applied Economics Association, Association of Environmental and Resource Economists, European Association of Environmental and Resource Economists, and Giannini Foundation of Agricultural Economics.

UNIVERSITY SERVICE – SELECTED

- Cooperating Faculty Member, Department of Environmental Sciences, 2014-24
- Cooperating Faculty Member, Department of Economics, 2004-24
- Chair, Academic Senate Committee on Educational Policy, 2014-15
- Graduate Advisor, Master's Program in Public Policy, 2014-15
- Faculty Affiliate, Center for Sustainable Suburban Development, 2005-15
- Faculty Affiliate, Center for Conservation Biology, 2004-15
- Conference Organizer, Urban Water Management Workshop, 2014
- Faculty Affiliate, Water Science & Policy Center, 2008-13
- Member, Strategic Planning Implementation Advisory Committee, 2010-12
- Vice Chair, Strategic Planning Committee on Excellence in Graduate Education, 2009-10
- Coordinating Committee Member, UC Center for Water Resources, 2008-09
- Graduate Advisor, Environmental Sciences Graduate Program, 2008
- Member, Academic Planning and Budget Committee on Sales and Service Activities, 2007-08
- Chair, Department of Environmental Sciences Budget Committee, 2007-08
- Chair, CNAS Scholarships & Honors committee, 2003-06
- Department Representative, CNAS Executive Committee, 2003-06

TEACHING AND OUTREACH – SELECTED

- *Environmental Economics* (required graduate course)
- *Environmental Economics* (required upper division course)
- *Introduction to Environmental Economics* (lower division survey course)
- Presented more than 40 invited scholarly talks
- Advisor/committee member for 11 Ph.D. students, 4 M.S. students and 2 postdoctoral scholars

RESEARCH FUNDING AND GRANTS – SELECTED (TOTAL: \$1.3M)

- Public Policy Institute of California: \$22,500 from 2016-17
- Moulton Niguel Water District: \$184,400 from 2015-17
- University of California Agricultural Experiment Station (USDA Hatch): \$50,000 from 2014-16
- Western Municipal Water District: \$30,750 from 2013-14
- Giannini Foundation of Agricultural Economics: \$27,000 from 2013-14
- University of California Agricultural Experiment Station (USDA Hatch): \$35,000 from 2012-14
- United States Department of Agriculture, Forest Service: \$64,000 from 2011-14
- Metropolitan Water District of Southern California: \$10,000 from 2012-13
- Giannini Foundation of Agricultural Economics: \$24,750 from 2011-13
- United States Department of Agriculture, Forest Service: \$16,500 from 2011-12
- Eastern Municipal Water District: \$28,000 from 2011-12
- United States Department of Education: \$300,000 from 2009-12
- University of California Agricultural Experiment Station (USDA Hatch): \$125,000 from 2007-12
- United States Department of Agriculture, Forest Service: \$52,500 from 2007-10
- Giannini Foundation of Agricultural Economics: \$10,000 from 2007-08
- University of California Institute for Mexico and the United States: \$25,000 from 2006-08
- United States Department of Agriculture, Forest Service: \$40,000 from 2005-07
- University of California Agricultural Experiment Station (USDA Hatch): \$125,000 from 2002-07
- United States Environmental Protection Agency: \$62,000 from 2005-06
- University of California Center for Water Resources: \$56,500 from 2004-06

CONSULTING – SELECTED

- Public Policy Institute of California: drought preparedness, 2015-17
- Western Municipal Water District: assessment of allocation-based water rates, 2015
- Santa Ana Watershed Project Authority: adoption of allocation-based water rates, 2015
- Cardno ENTRIX: oil spill impact assessment, 2012
- Surfrider Foundation: coastal access, preservation and valuation, 2009 and 2012
- United States Geological Survey: Salton Sea restoration plan, 2007-08
- United States Forest Service: valuation of forest landscape disturbances, 2006
- Salton Sea Authority: valuation of ecosystem benefits, 2006