Ray G. Huffaker

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Education

- Ph.D., Agricultural Economics, University of California, Davis, 1983.
- J.D., University of California, Davis, School of Law, 1986.
- A.B., Economics and Italian, University of California, Davis, 1978.

Areas of Expertise

- Empirical nonlinear dynamics
- Echo State Neural Network AI
- Sustainability and resilience
- Biological systems modeling
- Biomathematical economics
- Economic dynamics
- Food system dynamics
- Water resource economics and policy
- Natural resource law and policy

Professional Experience

- Complex Systems Engineer, U.S. Forest Service ACES Program, 2024-present
- Professor Emeritus, Department of Agricultural and Biological Engineering, Institute of Food and Agricultural Sciences, University of Florida, 2023-present.
- Professor, Ecosystems Complexity Group, Department of Agricultural and Biological Engineering, Institute of Food and Agricultural Sciences, University of Florida, 2013-2023.
- Professor and Chair, Food and Resource Economics, University of Florida, 2008-2013.
- Professor, School of Economic Sciences, Washington State University, 2000-2008.
- Participating faculty, Interdisciplinary Training of Undergraduates in Biological and Mathematical Sciences, 2006-2008.
- Associate Professor, Department of Agricultural and Resource Economics, Washington State University, 1993-2000.
- Assistant Professor, Department of Agricultural and Resource Economics, Washington State University, 1990-1993.
- Adjunct Professor, Department of Natural Resource Sciences, Washington State University, Pullman, 1990-2008.
- Graduate Faculty, Environmental Science and Regional Planning Program, Washington State University, 1990-2008.
- Assistant Professor, Department of Agricultural Economics, University of Tennessee, Knoxville, 1987-1990.
- Lecturer and Post-Doctoral Researcher, Department of Agricultural Economics, University of California, Davis, 1984-1986.
- Parole Aid and Northern California Drug Abuse Coordinator, California Youth Authority, 1975-1978.

Courses Taught

- Biological Systems Modeling, doctoral level, 5 years
- Nonlinear Data Diagnostics, doctoral level, 5 years
- Global Water Resource Sustainability, 1 year
- Microeconomic Analysis, doctoral level, 5 years
- Macroeconomic Analysis, doctoral level, 4 years
- Natural Resource Economic Dynamics and Policy, doctoral level, 16 years
- Mathematical Optimization Techniques, doctoral level, 4 years
- Natural Resource Economics, master's level, 5 years
- Natural Resource Economics, junior/senior level, 1 year
- Natural Resource Law and Policy, junior/senior level, 6 years

Workshops Taught

- Data Diagnostics: Detecting and Characterizing Deterministic Structure in Time Series Data, University of Bonn, 2022.
- Economic Dynamics, University of Bologna, 2010, 2018
- Phase Space Reconstruction and Visual Recurrence Analysis, University of Bonn, 2010, 2018
- Singular Spectrum Analysis, University of Bonn, 2012
- Nonlinear Time Series Analysis, University of Nebraska, 2017
- Nonlinear Time Series Analysis, University de Louvain (Earth and Life Institute), Belgium , 2018.
- Reconstructing real-world system dynamics from time-series records, Public University of Navarra, Spain, 2019
- Module on "Nonlinear dynamics approach for soil moisture big data analysis," University of Cordoba, Spain, Workshop: Soil Moisture Training Network Course, 2019

Other Teaching Activities

- *IDEA Website: Internet Differential Equations Activities* (sponsored by a pair of two-year NSF grants). *IDEA* delivers ordinary and partial differential equations instructional material over the Internet to students and instructors worldwide. It encompasses Java-based classroom exercises from fields as diverse as mathematics, chemistry, agriculture, and economics (with Lofaro T., K.D. Cooper, and R. Poshusta). See http://www.sci.wsu.edu/idea/
- *Italy Study Abroad Program*. Semester long faculty-led program that allowed undergraduates to study global water issues in Florence, Italy (8 years)

Selected Professional Service and Honors

- Bonn International Fellow, Speaker: Distinguished Lecture Series "Innovation Pathways to Sustainability" (Transdisciplinary Research Area "Innovation and Technology for Sustainable Future), October 2022
- Visiting professorship, Public University of Navarre, Spain, Department of Engineering, January-July, 2022.
- Visiting professorship, Department of Agricultural Sciences, University of Bologna, January-July, 2015.
- Senior Visiting Fellowship in Nonlinear Dynamics, Institute of Advanced Studies, University of

Bologna, Summer 2011.
- Visiting Theodor-Brinkman Scholar, University of Bonn (2012, 2018).
- International Advisory Board, European Forum on System Dynamics and Innovation in Food Networks, University of Bonn, Germany, 2013 to present.
- Editorial Board, *Journal of Natural Resources Policy Research*, 2009 to present.
- Editorial Board, *Letters in Spatial and Resource Sciences*, 2010 to present.
- Scientific Advisory Board, *Economia Agro-Alimentare*, Societa' Italiana di Economia Agro-Alimentare (SIEA), 2012 to 2020
- Review panelist for NOAA Sectoral Applications Research Program (SARP), Climate and Water Resource Management Project, 2006.
- Review panelist for CEAP and Drainage Panel, USDA/ARS, 2006, 2007.
- Review panelist for the National Research Initiative Competitive Grants Program in the Water Resources Assessment and Protection Area, 1999-2002, 2005, 2006, 2008.
- Review panelist for the National Research Initiative Competitive Grants Program in the Water Quality Area, 2004.
- Faculty Hearing Committee Panel, Washington State University, 2006.
- Tenure and Promotion Committee, College of Agriculture, Human, and Natural Resource Sciences, Washington State University, 2003-2005.
- UCOWR Academic Advisory Committee established by the Army Corps of Engineers to develop a curriculum for a masters degree program in water resources planning, 2000.
- Advisory Board, *Choices*, American Agricultural Economics Association, 1996-2002.
- Editorial Council, *Journal of Agricultural and Resource Economics,* 1994-2002.
- Guest Co-Editor, *International Journal of Water Resources Development,* 1999-2000.
- Reviewer of state water legislation for Center of Environmental and Law and Policy, Seattle, Washington, 1997.
- Reviewer of state water legislation, Washington State Governor's Resource Policy Group, 1997.
- Secretary, Vice-Chair, Chair of W-190, Western Regional Project Technical Committee, "Water Management and Conservation in Western Irrigated Agriculture", 1995-1997.
- Reviewer of state water legislation for Washington State Senator Karen Frasier, 1996.
- Associate Editor, *Water Resources Research,* 1990-1993.
- President, Western Agricultural Economics Association, 2002-2003.
- Computational Science Award in Undergraduate Teaching, Ames Laboratory, United States Department of Energy, 1994.
- University Research Grant-In-Aid Award, Washington State University, 1992.
- Phi Beta Kappa, Phi Kappa Phi, University of California, Davis, 1977.
- Best Graduating Senior, Italian, University of California, Davis, 1978.

Publications (*paper arising out of dissertation/thesis/undergraduate project that I supervised

1. **Huffaker, R.**, R. Muñoz-Carpena, K. Migliaccio (2024). Sensor records can be used to forecast complex soil moisture dynamics with symbiosis of empirical nonlinear dynamics and echo neural network AI. *Computers and Electronics in Agriculture* 222 109031 https://doi.org/10.1016/j.compag.2024.109031 .
2. **Huffaker, R.**, M. Campo-Bescos, E. Luquin, J. Casali Sarasibar, R. Muñoz-Carpena (2024). Hydrologic records can be used to reconstruct the resilience of watersheds to climatic extremes. *Communications Earth & Environment*, 5:19 | https://doi.org/10.1038/s43247-023-01181-x |www.nature.com/commsenv .

3. Perondi, D. C. Fraisse, J. Watson, K. Boote, L. Zotarelli, and **R. Huffaker** (2023). Assessing the impact of sowing dates and ENSO in a drought index-based insurance for soybean. *Climate and Risk Management*, https://doi.org/10.1016/j.crm.2023.100544 .
4. Carter, J., **R. Huffaker**, A. Singh, and E. Bean (2023). HUM: A review of hydrochemical analysis using ultraviolet-visible absorption spectroscopy and machine learning. *Sci. Total Environ*. 901 165828, https://doi.org/10.1016/j.scitotenv.2023.165826 .
5. Mustafa, Z., G. Vitelli, **R. Huffaker**, and M. Canavari **(**2023). A systematic review of price volatility in agriculture. *Journal of Economic Surveys*, DOI: 10.1111/joes.12549.
6. Morgan, S.,* **R. Huffaker**, Rafael Giménez, M. Campo-Bescos, R. Muñoz-Carpena, and G. Govers (2022). Experimental evidence that rill-bed morphology is governed by emergent nonlinear spatial dynamics. *Scientific Reports* 12.21500, https://doi.org/10.1038/s41598-022-26114-0.
7. Medina, M., D. Kaplan, E. Milbrandt, D. Tomasko, **R. Huffaker**, and C. Angelini (2022). Nitrogen-enriched discharges from a highly managed watershed intensify red tide (Karenia brevis) blooms in southwest Florida. *Sci. Total Environ*. 827:154149. doi: 10.1016/j.scitotenv.2022.154149.
8. Emaminejad, S., V. Morgan, K. Kumar, A. Kavathekar, C. Ragush, W. Shuai, Z. Jia, **R. Huffaker**, G. Wells, R. Cusick (2022). Statistical and microbial analysis of bio-electrochemical sensors used for carbon monitoring at water resource recovery facilities, *Environmental Science: Water Resource & Technology* DOI: 10.1039/d1ew00653c.
9. **Huffaker, R.**, G. Griffith, C. Dambui, M. Canavari (2021). Empirical detection and quantification of price transmission in endogenously unstable markets: The case of the global-domestic coffee supply chain in Papua New Guinea. *Sustainability* 13, 9172. https://doi.org/10.3390/sul13169172 .
10. **Huffaker, R.** and M. Hartmann (2021). Reconstructing dynamics of foodborne disease outbreaks in the US cattle market from monitoring data. *PLOS ONE* 16(1):e0245867.
11. Medina, M.,* **R. Huffaker**, R. Muñoz-Carpena, and G. Kiker (2021). An empirical nonlinear dynamics approach to analyzing emergent behavior of agent-based models. *AIP Advances*, https://doi.org/10.1063/5.0023116 .
12. Medina, M.,* **R. Huffaker**, J. Jawitz, and R. Muñoz-Carpena (2020). Seasonal dynamics of terrestrially sourced nitrogen influenced *Karenia brevis* blooms off Florida's southern Gulf Coast. *Harmful Algae* 98, https://doi.org/10.1016/j.hal.2020.101900 .
13. **Huffaker, R.** and E. McLamore (2020). A protocol for reconstructing the dynamics of real-world systems from observational data: Application for establishing a digital proxy of a bioreactor (DIYBOT). *Protocol Exchange* DOI: 10.21203/rs.3.pex-1052/v1.
14. McLamore, E., **R. Huffaker**, M. Shupler, K. Ward, S. Palit, A. Datta, M. Banks, G. Casaburi, J. Babilonia, and J. Foster (2020). Digital proxy of a bio-reactor (DIYBOT) combines sensor data and data analytics to improve greywater treatment and wastewater management systems. *Scientific Reports* 10.8015, https://doi.org/10.1038/s41598-020-64789-5.
15. Medina, M.,* **R. Huffaker**, J. Jawitz, and R. Muñoz-Carpena (2019). Nonlinear dynamics in treatment wetlands: Identifying systematic drivers of non-equilibrium outlet concentrations in Everglades STASs. *Water Resources Research*, 55. https://doi.org/10.1029/2018WR024427
16. **Huffaker, R.**, and A. Fearne (2019). Reconstructing systematic persistent impacts of promotional marketing with empirical nonlinear dynamics. *PLOS ONE* 14(9):e0221167 https://doi.org/10.1371/journal.pone.0221167 .
17. Bean, E., **R. Huffaker**, and K. Migliaccio (2018). Estimating field capacity from volumetric soil water content time series using automated processing algorithms. *Vadose Zone Journal* 17:180073. doi:10.2136/vzj2018.04.0073 https://dl.sciencesocieties.org/publications/vzj/pdfs/17/1/180073
18. **Huffaker, R.**, M. Canavari and R. Muñoz-Carpena (2018). "Distinguishing between Endogenous and Exogenous Price Volatility in Food Security Assessment: An Empirical Nonlinear Dynamics Approach." *Agricultural Systems* 160:98-109.
19. **Huffaker, R.**, E. Berg, and M. Canavari (2018). Reconstructing deterministic economic dynamics

from volatile time series data in the Routledge Handbook of Agricultural Economics, edited by G. Cramer, K. Paudel, and A. Schmitz. Routledge press, Taylor and Francis Group, London, UK.

20. **Huffaker, R.**, M. Bittelli and R. Rosa (2017). Nonlinear Time Series Analysis with R. Oxford University Press. Oxford, UK.
21. Muneepeerakul, C., R. Muneepeerakul, and **R. Huffaker** (2017). Rainfall Intensity and Frequency Explain Production Basis Risk in Cumulative Rain Index Insurance. *Earth's Future* https://doi.org/10.1002/2017EF000661.
22. George, M., R. Hotchkiss and **R. Huffaker** (2016). "Reservoir Sustainability and Sediment Management," *Journal of Water Resources and Planning.* DOI: 10.1061/(ASCE)WR.1943-5452.0000720.
23. **Huffaker, R.**, R Munoz-Carpena, M. Campos-Bescos and J. Southworth. "Demonstrating Correspondence between decision-support models and dynamics of real-world environmental systems," *Environmental Modelling and Software* 83(2016)74-87.
24. **Huffaker, R.** (2016). "Institutional aspects and policy background of water scarcity problems in the United States" in Competition for Water Resources: Experiences and Management Approaches in the US and Europe, edited by J. Ziolkowska and J. Peterson, Elsevier, N.Y.
25. **Huffaker, R.** "Building Economic Models for the Real World." *Applied Economic Perspectives and Policy* (2015), doi:10.1093.
26. Berg, E. and **R. Huffaker**. "What drives the German hog cycle? Diagnostic modeling of a nonlinear dynamic system." *Int. J. Food System Dynamics* 6(2015):64-80.
27. **Huffaker R** and M. Bittelli. "A Nonlinear Dynamics Approach for Incorporating Wind-Speed Patterns into Wind-Power Project Evaluation." *PLOS ONE* 10(2015): e0115123. doi:10.1371/journal. pone.0115123
28. **Huffaker, R.** (2015). "Tradeoffs: fish, farmers, and energy on the Columbia" in Routledge Handbook of Water Economics and Institutions, edited by K. Burnett, R. Howitt, J. Roumasset, and C. Wada, Routledge, N.Y.
29. **Huffaker, R.**, and Bittelli, M. Can Siting New Wind Farms Be Simply About Finding the Right Supply-Demand Match? *Renewable Energy World* (Tuesday, December 16, 2014). Also appearing in *The Energy Development Center*, *Global Energy News*, *Renewable Energy News*, and *Windpower Engineering & Development.*
30. Larkin, S., **R. Huffaker**, and R. Clouser. "Negative Externalities and Oil Spills: A Case for Reduced Brand Value to the State of Florida." *Journal of Agricultural & Applied Economics* 45(2013): 389-399.
31. McCullough, M.,* T. Marsh, and **R. Huffaker**. "Reconstructing Market Reactions to Consumption Harms." *Applied Economic Letters* 20(2013):173-179.
32. Benson, A.,* and **R. Huffaker**. "The Impact of Agricultural Water Conservation Policy on Economic Growth." *The Open Hydrology Journal* 6(2012): 112-117 doi 10.2174/1874378101206010112.
33. McCullough, M.,* **R. Huffaker**, and T. Marsh. "Endogenously Determined Cycles: Empirical Evidence from Livestock Industries." *Nonlinear Dynamics, Psychology, and Life Sciences* 16(2012):205-231.
34. **Huffaker, R.** "Dynamic Analysis." Chapter 2 in Dynamic Analysis Research Tools in Natural Resource and Environmental Economics, eds. A. Batabyal and P. Nijkamp, World Scientific Publishing Co. Pte. Ltd., London (2011) .
35. **Huffaker, R.**, D. Rider,* and R. Hotchkiss. "Stability and Bifurcation Analysis of Reservoir Sedimentation Management." *The Open Hydrology Journal* 4(2010):184-193.
36. **Huffaker, R.** "Phase Space Reconstruction from Economic Time Series Data: Improving Models of Complex Real-World Dynamic Systems." *International Journal on Food System Dynamics* 3(2010):184-193.

37. **Huffaker, R.** "Impacts of Biofuels on Water Supply: Proposed Cures May Worsen the Disease." *Choices* 3(2010):7-10.
38. **Huffaker, R.** "Protecting Water Resources in Biofuels Production." *Water Policy* 12(2009):129-34.
39. **Huffaker, R.** "The Conservation Potential of Agricultural Water Conservation Subsidies." *Water Resources Research,* 44, W00E01, doi:10.1029/2007WR006183 (2008).
40. Cembali, T., R.J. Folwell, **R. Huffaker**, J. McCluskey, and P. Wandschneider. "Economic Evaluation of Selective Mechanical Harvesting for Asparagus." *Acta Hort*. (ISHS, 2008) 776:33-44.
41. Bhat, M., and **R. Huffaker**. "Optimal Management of a Transboundary Migratory Wildlife Population: A Self-Enforcing Cooperative Agreement with Renegotiation and Variable Transfer Payments." *Journal of Environmental Economics and Management* 53(2007):54-67.
42. Cembali, T., Raymond J. Folwell, **R. Huffaker**, Jill McCluskey, and Philip Wandschneider. "Economics of Alternative Simulated Manual Asparagus Harvesting Strategies." *Agricultural Systems* 92(2007): 266-294.
43. **Huffaker, R.**, and J. Hamilton. "Conflict in U.S. Irrigation." Chapter 1 (pp. 3-22) in Irrigation of Agricultural Crops Monograph, eds. R. Lascano and R. Sojka, American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America (2007).
44. Cembali, T., Raymond J. Folwell, Jill McCluskey, **R. Huffaker**, and Philip Wandschneider, 2006. "Economic Analysis of the Inter-year Effect of Alternative Harvesting Strategies for Asparagus." *Journal of Vegetable Science* 12(2006): 29-50.
45. **Huffaker, R.**, and R. Hotchkiss. "Economic Dynamics of Reservoir Sedimentation Management: Optimal Control with Singularly Perturbed Equations of Motion." *Journal of Economic Dynamics and Control* 30(2006):2553-2575.
46. Grimsrud, K.,* and **R. Huffaker**. "Solving Multidimensional Bioeconomic Problems with Singular-Perturbation Reduction Methods: Application to Managing Pest Resistance to Pesticidal Crops." *Journal of Environmental Economics and Management* 51(May 2006):336-353.
47. Thimmes, A.,* **R. Huffaker**, and R. Hotchkiss. "A Law and Economics Approach to Resolving Reservoir Sediment Management Conflicts*." Journal of American Water Resources Association* 41(December 2005):1449-1456.
48. **Huffaker, R**. "Finding a Modern Role for the Prior Appropriation Doctrine in the American West," in Water Resources Management-Structure, Evolution, and Performance of Water Institutions. Editors: C. Gopalakrisnan, C. Tortajada, A. Biswas, Springer-Verlag, pp. 187-198, 2005.
49. Chouinard, H., **R. Huffaker**, T. Heckelie, and T. Wahl (senior authorship not assigned among first two authors). "Managing the Bill Emerson Humanitarian Trust as a Successful Marriage between Farm-Support and Humanitarian Interests." *The Journal of Humanitarian Assistance* (June 2004): http://www.jha.ac/articles/a136.htm.
50. **Huffaker, R**., R. Mittelhammer, P. Barkley, and R. Folwell. "Community Dynamics in a University Environment." *Nonlinear Dynamics, Psychology, and Life Sciences* 7(April 2003):181-203.
51. **Huffaker, R.**, and N. Whittlesey. "A Theoretical Analysis of Economic Incentive Policies Encouraging Agricultural Water Conservation." *International Journal of Water Resources Development* 19(March 2003):37-53.
52. **Huffaker, R.**, N. Whittlesey, and J. Hamilton. "Irrigated Agriculture and Endangered Species Policy." Encyclopedia of Water Science. Marcel Dekker, Inc. 2003.
53. McCluskey, J., **R. Huffaker**, and G. Rausser. "Neighborhood Effects and Compensation for Property Value Diminution." *Law & Policy* 24(January 2002):36-50.
54. **Huffaker, R.**, and R. Mittelhammer. "A Case for Adopting Appellate Review into AAEA Editorial Policy." *Review of Agricultural Economics* 24(Fall/Winter 2002):551-554.
55. **Huffaker, R.**, and R. Mittelhammer. "Response: What's Good for the Goose is Good for the Gander." *Review of Agricultural Economics* 24(Fall/Winter 2002):555-558.
56. Leigh, D, **R. Huffaker**, and R. Shumway. "A Long Road to Merger of Existing Programs at

Washington State University." *American Journal of Agricultural Economics* 84(August 2002):854-859.

57. **Huffaker, R.**, A. Michelsen, J. Hamilton, and M. Frasier. "The Uneasy Hierarchy of Federal and State Water Laws and Policies." *Water Resources Update* 118(January 2001):3-10.
58. **Huffaker, R.** and N.K. Whittlesey. "The Allocative Efficiency and Conservation Potential of Water Laws Encouraging Investments in On-Farm Irrigation Technology." *Agricultural Economics* 24(2000):47-60.
59. Marsh, T.L.,* **R. Huffaker** and G. Long. "Optimal Control of Vector-Virus-Plant Interactions in the Production of a Storable Commodity: The Case of PLRV Net Necrosis." *American Journal of Agricultural Economics* 83(August 2000):556-569.
60. Marsh, T.L.,* R.C. Mittelhammer, **R. Huffaker**. "Model-Driven Approach to Test and Correct Field Experiment Data for Spatial Correlation by Plot." *Journal of Agricultural, Biological and Environmental Statistics* 5(2000):22-36.
61. **Huffaker, R.**, N.K. Whittlesey and J. Hamilton. "The Role of Prior Appropriation in Allocating Water Resources into the 21st Century." *International Journal of Water Resources Development* 16(June 2000):265-275.
62. **Huffaker, R.**, M. Frasier and J. Hamilton. "The 'Intrastate-Trade-Restriction' Defense in Commerce-Clause Challenges of State-Imposed Restrictions on Water Exports to Neighboring States." *International Journal of Water Resources Development* 16(June 2000):275-279.
63. Gopalakrishnan, C., and **R. Huffaker**. "Water and Agriculture in the American West." *International Journal of Water Resource Development* 16(June 2000):173-176.
64. Taylor, R.G., A.M. Michelsen, and **R. Huffaker**. "Why the Price Chain for Federally-Developed Irrigation Water Doesn't Promote Conservation." *Choices* (Third Quarter 2000):13-16.
65. Michelsen, A., R.G. Taylor, **R. Huffaker** and T. McGuckin. "Emerging Price Conservation Programs in Agricultural Water Use." *Journal of Agriculture and Resource Economics* 24(July 1999):222-238.
66. Frasier, M., A. Michelsen, R. Taylor, J. Booker, and **R. Huffaker**. "Evaluating Economic and Institutional Alternatives for Meeting Interstate ESA Instream Flow Requirements in the Platte River Basin." *American Journal of Agricultural Economics* 81(December 1999):1257-1261.
67. Tozer, P.,* and **R. Huffaker**. "Dynamics of Optimal Interactions Between Pasture Production and Milk Yield of Australian Dairy Farms." *Journal of Agricultural and Resource Economics* 24(July 1999):155-172.
68. Tozer, P.,* and **R. Huffaker**. "Mathematical Equations to Describe Lactation Curves for Holstein-Friesian Cows in New South Wales." *Australian Journal of Agricultural Research* 50(March 1999):431-40.
69. **Huffaker, R.**, K. Cooper and T. Lofaro. "Small Mammal Dispersion." *The UMAP Journal* 20.1(1999):47-65.
70. Cooper, K., **R. Huffaker** and T. Lofaro. "Rangeland Ecosystems." *The UMAP Journal* 20.1(1999):29-45.
71. **Huffaker, R.** and S. Levin (1999). "A Framework for Analyzing Regulatory Takings Issues: The Case of Grass Burning Restrictions in Eastern Washington State," in *The Economics of Environmental Regulation and Technology Adoption in Agriculture*, eds. F. Casey, A. Schmitz, S. Swinton and D. Zilberman, Kluwer Academic Press, pp. 307-322.
72. **Huffaker, R.**, N.K. Whittlesey, A. Michelsen, R.G. Taylor and T. McGuckin. "Evaluating the Effectiveness of Conservation Water-Pricing Programs: Reply." *Journal of Agriculture and Resource Economics* 23(July1998):12-19.
73. **Huffaker, R.** "Deterministic Modeling Without (Unwarranted) Apology." *Review of Agricultural Economics* 20(Fall/Winter 1998):500-510.
74. Marsh, T.L.,* **R. Huffaker**, R.C. Mittelhammer, R.J. Folwell, G.E. Long, D.R. Horton, and H.H.

Toba. "Potato Leaf Roll Virus Net Necrosis in Tubers: Identifying Pest Management Tradeoffs between the Inoculation Interval, Storage Length, and Tuber Weight." *Journal of Economic Entomology* 91(August 1998):923-932.

75. **Huffaker, R.** Evaluating the Effectiveness of Conservation Water-Pricing Programs: Reply. *Journal of Agriculture and Resource Economics* 23(December 1998):571-72.
76. **Huffaker, R.**, N.K. Whittlesey, A. Michelsen, R.G. Taylor and T. McGuckin. "Evaluating the Effectiveness of Conservation Water-Pricing Programs." *Journal of Agriculture and Resource Economics* 23(July1998):12-19.
77. Roosen, J.,* **R. Huffaker**, R.J. Folwell, T.L. Marsh and R.C. Mittelhammer. "The Relation of Potato Leaf Roll Virus Net Necrosis in Potato Tubers to Time of Inoculation and Storage Length." *Crop Protection* 16(6):533-539 (1997).
78. Cooper, K.D., and **R. Huffaker**. "The Long-Term Bioeconomic Impacts of Grazing on Plant Succession in a Rangeland Ecosystem." *Ecological Modeling* 97(1997):59-73.
79. Bhat, M.G.,* and **R. Huffaker**. "Controlling Transboundary Wildlife Damage: Modeling Under Alternative Management Scenarios." *Ecological Modeling* 92(1996):215-224.
80. **Huffaker, R.**, K. D. Cooper, and T. LoFaro. "Small Mammal Dispersion." *CODEE* (Consortium for Ordinary Differential Equation Experiments) (Winter 1996):5-8.
81. **Huffaker, R.**, and K.D. Cooper. "Plant Succession as a Natural Range Restoration Factor in Private Livestock Enterprises." *American Journal of Agricultural Economics* 77(November 1995):901-913.
82. Whittlesey, N.K., and **R. Huffaker**. "Water Policy Issues for the 21st Century." *American Journal of Agricultural Economics* 77(December 1995):1199-1203.
83. **Huffaker, R.** "Encouraging Water Marketing Within the Prior Appropriation System." *Illahee* 11 (Spring-Summer 1995):87-93. Institute for Environmental Studies, University of Washington.
84. **Huffaker, R.**, and N.K. Whittlesey. "Agricultural conservation legislation: Will it Save Water?" *Choices* (Fourth Quarter 1995):24-28.
85. Cooper, K. D., **R. Huffaker**, and T. LoFaro. "Rangeland Ecosystems." *CODEE* (Consortium for Ordinary Differential Equation Experiments) (Winter 1995):11-13.
86. LoFaro,T., K. Cooper, and **R. Huffaker**. "Model Neurons and Fast-Slow Systems." *CODEE* (Consortium for Ordinary Differential Equation Experiments) (Spring 1995):13-14.
87. Bhat, M.G.,* **R. Huffaker** and S.M. Lenhart. "Controlling Forest Damage by Dispersive Beaver Populations." *Ecological Applications* 3(3):518-530, 1993, Ecological Society of America.
88. **Huffaker, R.** "Optimal Management of Game and Forage Resources in a Private Fee-Hunting Enterprise." *American Journal of Agricultural Economics* 75(August 1993):696-710.
89. Bhat, M.G.,* and **R. Huffaker**. "Private Property Rights and Forest Preservation in Karnataka Western Ghats, India: Reply." *American Journal of Agricultural Economics* 75(May 1993):496-498.
90. **Huffaker, R.**, N.K. Whittlesey and P.R. Wandschneider. "Institutional Feasibility of Contingent Water Marketing to Increase Migratory Flows for Salmon on the Upper Snake River." *Natural Resources Journal* 33 (Summer 1993):671-696.
91. Whittlesey, N.K., **R. Huffaker** and W.R. Butcher. "Grazing Policy on Public Lands." *Choices* (Third Quarter 1993):15-19.
92. **Huffaker, R.**, M.G. Bhat and S.M. Lenhart. "Optimal Trapping Strategies for Diffusing Nuisance-Beaver Populations." *Natural Resource Modeling* 6(Winter 1992):71-98, Rocky Mountain Mathematics Consortium.
93. **Huffaker, R.,** and J.E. Wilen. "Animal Stocking Under Conditions of Declining Forage Nutrients." *American Journal of Agricultural Economics* 73(November 1991):1213-1223.
94. Bhat, M.G.,* and **R. Huffaker**. "Private Property Rights and Forest Preservation in Karnataka Western Ghats, India." *American Journal of Agricultural Economics* 73(May 1991):375-87.
95. **Huffaker, R.** and G.K. Pompelli. "State Native-Wine Laws: A Commerce-Clause Resistant Strain of Economic Protectionism?" *Journal of Agricultural Taxation and Law* 3(Summer 1991):148-61.

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98. **Huffaker, R.**, J.E. Wilen, and B.D. Gardner. "Multiple-use Benefits on Public Rangelands: An Incentive-based System." *American Journal of Agricultural Economics* 71(August 1989):670-678.
99. **Huffaker, R.** "Market-based Policies to Increase Home Mortgage Credit in Declining Urban Neighborhoods." *The Banking Law Journal* 106(November-December 1989):538-549.
100. Gardner, B.D., and **R. Huffaker**. "Cutting the Loss from the Federal Water Subsidy: Reply." *Choices* (First Quarter 1989):40-41.
101. Gardner, B.D., and **R. Huffaker**. "Cutting the Loss from the Federal Water Subsidy." *Choices* (Fourth Quarter 1988): 24-26.
102. **Huffaker, R.**, and B.D. Gardner. "Rancher Stewardship on Public Lands: A Recent Court Decision." *Natural Resources Journal* 27(Fall 1987):887-98.
103. **Huffaker, R.**, and B.D. Gardner. "The Distribution of Economic Rents Arising from Subsidized Water When Land is Leased." *American Journal of Agricultural Economics* 68(May 1986):306-312.
104. **Huffaker, R.**, and B.D. Gardner. "The Hammer Clause of the Reclamation Reform Act of 1982." *Natural Resources Journal* 26(January 1986):41-69.
105. **Huffaker, R.** "The Hammer Clause: Reclamation Reform Act of 1982." *Environs* 9(2):1-4, 1985.

Grant and Contract Awards

A Controlled Environment Agriculture Platform for Cultivation of Salt-Tolerant Crops with Integrated Saline Water Irrigation and Salinity Management, NIFA/USDA, $2,124,891, 2023-2027. (Huffaker role: Collaborator, 1.5 months, $22,888)

Symbiosis of machine learning, nonlinear time series analysis, and novel supercomputing to reconstruct soil-biome nonlinear dynamics from field and remote-sensing large data, UF Research, Artificial Intelligence Research Catalyst Fund, $50,000, 1/1/2021 to 1/1/2022.

A nonlinear dynamics approach to data-enabled science: Reconstructing soil-moisture dynamics from big data collected by wireless sensor networks, UFII (UF Informatics Institute) SEED Fund, $13,000, 06/01/2019 – 06/01/2020

Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development, USDA/NIFA Hispanic Serving Institutions Education Grants, $63,503.71, 2015.

Calculating indirect and passive-use damages to Florida from the Deepwater Horizon Disaster, Office of Economic and Demographic Research of the Florida Legislature, $750,000, 2011-12.

Integrated Education and Research for Sustainable Development: Linking Engineering and Economic Sciences, USDA Food and Agricultural Sciences National Needs Graduate Fellowship Program, Contract No: 2008-38420-04761, 9/1/2008-8/31/2013, $258,000.

UBM: Foundation in mathematical biology through interdisciplinary research, training, and curriculum development," National Science Foundation, 2005-2010, $905,000 (I am a participant on this grant drawing a month of summer salary for directing undergraduate research projects in biomathematics).

Maximizing Study Abroad Assessment Program, Washington State University Undergraduate Teaching and Learning Assessment Initiative, 2005-2006, $22,000.

Tradeoffs and Resource Allocation Effects for Alternative IS Management Policies. Resource Implications of Invasive Species Policy and Program Alternatives, NRI, USDA. 2003-2005, $141,518.

Alternative Water Institutional Structures to Mitigate Producer Impacts Due to Drought and/or Federal Decisions Restricting Water for Irrigation. Cooperative Agreement 43-3AEL-2-80094. USDA-ERS.

2002-2005, $25,000.

Meeting Time-Dependent Instream Flow Requirements in a Fully Appropriated Multi-State River Basin, Water Resources Center, Regional Competitive Grants Program, October 1998 to October 2000, $291,932.

IDEA: Internet Differential Equations Activities, Renewal of NSF Grant No. DUE-9555228, April 1998 to March 31 2000, $99,977.

Effectiveness of Irrigation District Conservation Price Programs, Water Resources Center, Regional Competitive Grants Program, September 1996 to September 1998, $74,725.

Dynamic Interactions Between Pasture Production, Milk Yields and Economic Viability of NSW Dairy Farms, Dairy Research and Development Program and the University of New England, Armidale, NSW, Australia, 1996-1998, $25,000.

IDEA: Internet Differential Equations Activities, NSF Grant No. DUE-9555228, April 1996 to April 1998, $93,322.

Optimal Control of Vegetation-Ungulate-Hunter Interactions in a Private Fee-Hunting Enterprise, Research Grant-In-Aid Award, WSU, 1992-1993, $14,000.

Legal and Economic Problems of Converting Irrigation Water to Fish Production in the Upper Snake River, State of Washington Water Research Center, Project no. A-175-WASH, Grant no. G-2053, May 1991 to May 1992, $15,000.

Major Professor in Supervision and Training of Graduate Students

(**Note:** Did not supervise doctoral students 2008-2013 while serving as Chair of the Department of Food and Resource Economics, University of Florida.)

- Savannah Morgan, PhD., Agricultural and Biological Engineering, 2023.
- Miles Medina, Ph.D., Agricultural and Biological Engineering, 2019.
- Michael McCullough, Ph.D., Economics, 2008.
- Aaron Benson, Ph.D., Economics, 2008.
- Amanda Thimmes, M.A., Agricultural Economics, 2003.
- Gordon Card, M.A., Agricultural Economics, 2003.
- Kristine Grimsrud, Ph.D., Agricultural Economics, 2002.
- Bruce Heckman, M.S., Environmental Science and Regional Planning, 2002.
- Tom Marsh, Ph.D., Agricultural Economics, 1998.
- Peter Tozer, Ph.D., Agricultural Economics, 1998.
- Jutta Roosen, M.A., Agricultural Economics, 1996.
- Stina Levin, M.A., Agricultural Economics, 1995.
- Tom Guertler, M.A., Economics, 1995.
- Donald Yule, M.A., Economics, 1995.
- Robert Funk, M.A., Economics, 1993.
- Mohadev Bhat, Ph.D., Agricultural Economics, University of Tennessee, 1990.
- Gary Cole, Ph.D., Agricultural Economics, University of Tennessee, 1990.

Positions Taken by Ph.D. Students

- Miles Medina, Environmental Engineering, Wood International.
- Aaron Benson, Department of Agricultural Economics, Texas Tech University.
- Michael McCullough, Department of Agribusiness, Cal Poly, SLO.
- Kristine Grimsrud, Department of Economics, University of New Mexico.

- Tom Marsh, Department of Agricultural and Resource Economics, Kansas State University.
- Peter Tozer, Department of Animal Science, Pennsylvania State University.
- Gary Cole, United States Environmental Protection Agency.
- Mohadev Bhat, Department of Natural Resource Sciences, Florida International University.