

**UNIVERSITY OF WYOMING  
COLLEGE OF BUSINESS  
CURRICULUM VITAE  
DATE 1/30/18**

**NAME:**           David C. Finnoff

**WORK ADDRESS**

Department of Economics  
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**HOME ADDRESS**

**EDUCATION**

2001	Ph.D.	Economics	University of Wyoming	Laramie, WY
1994	B.S.	Economics	University of Wyoming	Laramie, WY

**ACADEMIC POSITIONS**

2010-	Associate Professor, Department of Economics and Finance, University of Wyoming
2004- 2010	Assistant Professor, Department of Economics and Finance, University of Wyoming
2001-2004	Assistant Professor, Department of Economics, University of Central Florida

**BUSINESS EXPERIENCE**

**CURRENT JOB DESCRIPTION**

37.5% Teaching    45% Research    5% Service    0% Admin    12.5% Advising

**RESEARCH INTERESTS:**

Applied Microeconomic Theory including:  
Management of renewable and non-renewable resources, endogenous risk, coupled human and natural systems, invasive species, native pests, endemic human diseases, emerging infectious diseases, regulation, optimal control theory, real options, computable general equilibrium

**TEACHING INTERESTS:**

Applied Microeconomic Theory including:

Introductory, intermediate, and advanced microeconomic theory

Natural resource economics

Environmental economics

Dynamic optimization

Public economics

Mathematical economics

History of economic thought

**TEACHING**

List all courses taught at UW during the last 5 years. Include labs and independent study courses.

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2018	Fall	ECON 4320 Math Economics	3	14
2017	Spring	ECON 4240 Hist Economic Thought	3	45
2017	Spring	ECON 5130 Dynamic Optimization	3	5
2016	Fall	ECON 4410 Natural Resource Economics	3	28
2016	Fall	ECON 3020 Intermediate Microeconomics	3	1
2016	Spring	ECON 4240 Hist Economic Thought	3	38
2016	Spring	ECON 5120 Advanced Microeconomics II	3	8
2015	Fall	ECON 1020 Principles of Microeconomics	3	116
2015	Spring	ECON 4240 Hist Economic Thought	3	28
2015	Spring	ECON 5120 Advanced Microeconomics II	3	6
2014	Fall	ECON 4410 Natural Resource Economics	3	13
2014	Spring	ECON 4240 Hist Economic Thought	3	35
2014	Spring	ECON 5120 Advanced Microeconomics II	3	5
2013	Fall	ECON 4410 Natural Resource Economics	3	18
2013	Spring	ECON 4240 Hist Economic Thought	3	26
2013	Spring	ECON 5130 Dynamic Optimization	3	9
2012	Fall	ECON 4410 Natural Resource Economics	3	14
2012	Spring	ECON 4240 Hist Economic Thought	3	24
2012	Spring	ECON 5130 Dynamic Optimization	3	13
2011	Fall	ECON 4520 Public Economics	3	11
2011	Spring	ECON 4240 Hist Economic Thought	3	20
2011	Spring	ECON 5130 Dynamic Optimization	3	11
2010	Fall	ECON 4320 Math Economics	3	10
2010	Spring	ECON 4240 Hist Economic Thought	3	25
2010	Spring	ECON 5130 Dynamic Optimization	3	15
2009	Fall	ECON 4320 Math Economics	3	25
2009	Spring	ECON 4240 Hist Economic Thought	3	8
2009	Spring	ECON 5130 Dynamic Optimization	3	30
2008	Fall	ECON 4320 Math Economics	3	11
2008	Spring	ECON 5120 Advanced Microeconomics II	3	6
2008	Spring	ECON 4240 Hist Economic Thought	3	29
2007	Fall	ECON 3020 Intermediate Microeconomics	3	33
2007	Fall	ECON 4320 Math Economics	3	6
2007	Spring	ECON 5120 Advanced Microeconomics II	3	9

2007	Spring	ECON 4240 Hist Economic Thought	3	49
2006	Fall	ECON 3020 Intermediate Microeconomics	3	39
2006	Fall	BADM e5100 Fnd.s in Quant. An.(web)	3	13
2006	Spring	ECON 5120 Advanced Microeconomics II	3	6
2006	Spring	ECON 3020 Intermediate Microeconomics	3	41
2005	Fall	ECON 3020 Intermediate Microeconomics	3	33
2005	Fall	BADM e5100 Fnd.s in Quant. An.(web)	3	8
2005	Spring	ECON 5120 Advanced Microeconomics II	3	9
2005	Spring	ECON 3020 Intermediate Microeconomics	3	42
2004	Fall	BADM 5100 Fnd.s in Quant. An.	3	5
2004	Fall	BADM e5100 Fnd.s in Quant. An.(web)	3	7
2004*	Spring	Economic Analysis of The Firm (MBA)	3	80
2004*	Spring	Quantitative Business Tools (Honors)	3	7
2003*	Fall	Economics of the Environment	3	10
2003*	Fall	Quantitative Business Tools (Honors)	3	12
2003*	Spring	Quantitative Business Tools	3	44
2002*	Fall	Economics of the Environment	3	17
2002*	Fall	Quantitative Business Tools	3	79
2002*	Spring	Quantitative Business Tools	3	54
2002*	Spring	Quantitative Business Tools	3	72
2001*	Fall	Principles of Microeconomics	3	90
2001*	Fall	Quantitative Business Tools	3	49
2000	Fall	Principles of Microeconomics	3	?
2000	Fall	Money and Banking	3	?
2000	Spring	Principles of Microeconomics	3	?
1999	Fall	Intermediate Microeconomics	3	?
1997	Fall	Money and Banking	3	?

\*At the University of Central Florida

## **PUBLICATIONS**

### **Refereed Journal Articles:**

#### **Accepted, Forthcoming and Published (list from newest to oldest)**

- Horan, R. **D. Finnoff**, J.F. Shogren, C. Reeling and K. Berry. 2018. “Managing Wildlife Faced with Pathogen Risks Involving Multi-Stable Outcomes,” accepted for publication, *Environmental and Resource Economics*.
- Lee, K.D., **D. Finnoff** and P. Daszak. 2017. “Impacts of pathogen introduction risk on importer behavior and gains from trade in the livestock industry,” accepted for publication, *EcoHealth*.
- Horan, R, E. Fenichel, **D. Finnoff** and C. Reeling. 2017 “A Portfolio-Balancing Approach to Natural Capital and Liabilities: Managing Livestock and Wildlife Diseases with Cross Species Transmission and Trade,” *Environment and Resource Economics*, published online

May 2017.

- Berry, K. C., **D. Finnoff**, Richard D Horan and McDermott, S. 2017. “The role of restoration in the prevention of a large-scale native species loss: Case study of the invasive emerald ash borer,” *Journal of Forest Economics*, 27: 91–98.
- Sims, C., **D. Finnoff**, A. Hastings, and J. Hochard. 2017. “Linking listing and delisting decisions for endangered species: A case study of gray wolves in the Northern Rocky Mountains,” *American Journal of Agricultural Economics*, 99(3): 549–570.
- Hochard, J. and **D. Finnoff**. 2017. “Fitness Optimality with Intraspecific Interaction: A Model of Gray Wolf Territory Choice,” *Journal of Theoretical Biology*, 420: 41-52.
- Sims, C., and **D. Finnoff**. 2016. “Opposing irreversibilities in environmental policy: Avoiding the point of no return or delaying the inevitable,” *Journal of the Association of Environmental and Resource Economists*, 3(4): 985–1022.
- Sims, Charles, **David C. Finnoff** and Jason F. Shogren, 2016. “Taking One For the Team: Sequential learning and the Precautionary Principle,” *Environmental and Resource Economics*, published online November 2016.
- Berry, K. and **D. Finnoff**. 2016. “Choosing between adaptation and prevention with an increasing probability of a pandemic,” *Journal of Economic Behavior and Organization*, 132: 177–192.
- Finnoff, D.**, R. Horan, J.F. Shogren, C. Reeling and K. Berry. 2016. “Natural vs anthropogenic risk reduction: Facing invasion risks involving multi-stable outcomes,” *Journal of Economic Behavior and Organization*, 132: 113–123.
- Sims, C., **D. Finnoff** and S.M. O’Regan. 2016. “Public control of rational and unpredictable epidemics,” *Journal of Economic Behavior and Organization*, 132: 161–176.
- Wood, A., C. Mason, and **D. Finnoff**. 2016. “OPEC, the Seven Sisters, and Oil Market Dominance: An Evolutionary Game Theory and Agent-Based Modeling Approach,” *Journal of Economic Behavior and Organization*, 132: 66–78.
- Sims, C, **D. Finnoff** and C. Mason. 2016. “Thresholds, tipping points, and random events in dynamic economic systems,” *Journal of Economic Behavior and Organization*, 132: 1-4.
- McDermott, S. and **D. Finnoff**. 2016. “Impact of repeated human introductions and the Allee effect on invasive species spread,” *Ecological Modelling*, 329(10):100-111.
- Lodge, D., Simonin, P.W., S.W. Burgiel, R.P. Keller, J.M. Bossenbroek, C.L. Jerde, A.M. Kramer, E.S. Rutherford, M.A. Barnes, M.E. Wittmann, W.L. Chadderton, J.L. Apriesnig, D. Beletsky, R.M. Cooke, J.M. Drake, S.P. Egan, **D. C. Finnoff**, C.A. Gantz, E.K. Grey, M.H.

- Hoff, J.G. Howeth, R.A. Jensen, E.R. Larson, N.E. Mandrak, D.M. Mason, F.A. Martinez, T.J. Newcomb, J.D. Rothlisberger, A.J. Tucker, T.W. Warziniack, H. Zhang. 2016. “Risk Analysis And Bioeconomics Of Invasive Species To Inform Policy And Management,” *Annual Review Of Environment And Resources*, **41**:453–88.
- Sims, Charles, **David C. Finnoff** and Jason F. Shogren. 2016. “Bioeconomics of Invasive Species: Using Real Options Theory to Integrate Ecology, Economics, and Risk Management,” *Food Security*, **8**(1): 61-70.
- Horan, Richard, Eli Fenichel, **David Finnoff** and Chris Wolfe. 2015. “Managing Epidemiological Risks through Trade” *Journal of Economic Dynamics and Control*, **53**: 192–207.
- Berry, Kevin, **David Finnoff**, Richard Horan and Jason F. Shogren. 2015. “Managing the Endogenous Risk of Disease Outbreaks with a Non-Constant Background Hazard Rate,” *Journal of Economic Dynamics and Control*, 51: 166-179.
- Pike, Jamison, Tiffany Bogich, Sarah Elwood, **David C. Finnoff**, and Peter Daszak. 2014. “Economic optimization of a global strategy to reduce the pandemic threat,” *Proceedings of the National Academy of Sciences*, 111(52): 18519–18523, doi: 10.1073/pnas.1412661112.
- Sims, Charles, David Aadland, James Powell, **David C. Finnoff**, and Ben Crabb. 2014. “Complementarity in the provision of ecosystem services reduces the cost of mitigating amplified natural disturbance events,” *Proceedings of the National Academy of Sciences*, 111(47): 16718–16723.
- Perrings, Charles, C.Castillo-Chavez, G.Chowell, P.Daszak, E.P.Fenichel, **D.Finnoff**, R.D. Horan, A. M.Kilpatrick, A.P.Kinzig, N.V.Kuminoff, S.Levin, B.Morin, K.F. Smith, and M.Springborn. 2014. “Merging Economics And Epidemiology To Improve The Prediction And Management Of Infectious Disease,” *EcoHealth*, DOI: 10.1007/s10393-014-0963-6.
- Aadland, D., C. Sims and **D. Finnoff**. 2014. “Spatial Dynamics of Optimal Management in a Predator-Prey System: An Application to Mountain Pine Beetle Epidemics,” *Computational Economics*, Published online, April 2014, DOI 10.1007/s10614-014-9442-y.
- Hochard, J. and **D. Finnoff**. 2014. “Gray wolf population projection with intraspecific competition,” *Natural Resource Modeling*, 27(3): 360-375.
- Oliver, M., C. Mason and **D. Finnoff**. 2014. “Pipeline Congestion and Natural Gas Basis Differentials: Theory and Evidence,” *Journal of Regulatory Economics*, 46:261–291, DOI 10.1007/s11149-014-9256-9.
- Oliver, M., C. Mason, and **D. Finnoff**. 2014. Natural Gas Expansion and the Cost Of Congestion. *IAEE Energy Forum*, page 31-32, First Quarter 2014.

- Warziniack, T, **D. Finnoff**, J. F. Shogren, 2013. Public economics of hitchhiking species and tourism-based risk to ecosystem services. *Resource and Energy Economics*, 35: 277– 294.
- Sims, C., **D. Finnoff**, 2013. When is a “wait and see” approach to invasive species justified? *Resource and Energy Economics*, 35: 235–255
- Aadland, D., **D. Finnoff** and Kevin Huang, 2013. Syphilis Cycles. *The B.E. Journal of Economic Analysis & Policy*. 14(1): 297–348, ISSN (Online) 1935-1682, ISSN (Print) 2194-6108, DOI: 10.1515/bejeap-2012-0060.
- Sims, C., D. Aadland, **D. Finnoff**, and J. Powell, 2013. Mountain-pine beetle outbreaks and shifting social preferences for ecosystem services. *Land Economics*, 89: 154-176.
- McDermott, S., **D. Finnoff** and J. Shogren, 2013. The Welfare Impacts of an Invasive Species: Endogenous vs. Exogenous Price Models. *Ecological Economics*, 85: 43-49.
- Sims, C., and **D. Finnoff**, 2012. The role of spatial scale in the timing of uncertain environmental policy. *Journal of Economic Dynamics and Control*, 36: 369-382.
- Rothlisberger, J.D., **D. Finnoff**, D. M. Lodge and R. M. Cooke, 2012. Ship-borne nonindigenous species diminish Great Lakes ecosystem services. *Ecosystems*, 15: 462-476.
- Warziniack, T, **D. Finnoff**, J. Bossenbroek, J. F. Shogren, and D. Lodge, 2011. Stepping stones for biological invasion: A bioeconomic model of transferable risk. *Environment and Resource Economics*, 50(4): 605-627.
- Finnoff, D.**, M. Gong and J. Tschirhart, 2011. Perspectives on Ecosystem Based Management for Delivering Ecosystem Services with an Example from an Eighteen-Species Marine Model. *International Review of Environmental and Resource Economics*, 6: 79–118.
- A. Strong, J. Tschirhart, and **Finnoff, D.**, 2011. Is Economic Growth for the Birds? *Ecological Economics*, 70(7): 1375–1380.
- Finnoff, D.** and J. Tschirhart, 2011. Inserting Ecological Detail into Economic Analysis: Agricultural Nutrient Loading of an Estuary Fishery. *Sustainability* 2011, 3(10), 1688-1722.
- Finnoff D.**, M. A. Lewis and A. B. Potapov, 2010. Control and the Optimal Management of a Spreading Invader. *Resource and Energy Economics*, 32: 534-550.
- Deacon, R.T, **D. Finnoff**, and J. Tschirhart. 2010. Regulated Incomplete Ownership, Capacity Restrictions and Rent Dissipation. *Resource and Energy Economics*, 33:366-380.
- Sims, C., D. Aadland, **D. Finnoff**, 2010. A Dynamic Bioeconomic Analysis of Mountain Pine Beetle Epidemics. *Journal of Economic Dynamics and Control*, vol. 34, no. 12, pp. 2407-19.

- Finnoff, D.**, C.R. McIntosh, J.F. Shogren, C. Sims, and T. Warziniack, 2010. Invasive Species & Endogenous Risk. *Annual Review of Resource Economics*, vol. 2, no. 1, pp. 77-100.
- McIntosh, C.R., J.F. Shogren and **D.C. Finnoff**. 2010. Invasive Species and Delaying the Inevitable: Valuation Evidence from a National Survey, *Ecological Economics*, vol. 69, no. 3, pp. 632-40.
- Rothlisberger J. D., D. M. Lodge, R. M. Cooke and **D. Finnoff**, 2010. “Future of the binational Laurentian Great Lakes fisheries: environmentally and culturally driven declines,” *Frontiers in Ecology and the Environment*, 8:5, 239-244.
- Finnoff, D.** and J. Tschirhart. 2009. “Plant Competition and Exclusion with Optimizing Individuals,” *Journal of Theoretical Biology* 261(2): 227-37
- Finnoff, D.** and J. Tschirhart. 2008. Linking Dynamic Economic and Ecological General Equilibrium Models. *Resource and Energy Economics*, 30:91-114.
- Finnoff, D.**, A. Strong and J. Tschirhart. 2008. “A Bioeconomic Model of Cattle Stocking on Public Land Threatened by Invasive Plants and Nitrogen Deposition” *American Journal of Agricultural Economics*, 90(4): 1074–1090.
- Keller, R.P., D.M. Lodge, and **D.C. Finnoff**. 2007. Risk assessment for invasive species produces net bioeconomic benefits. *Proceedings of the National Academy of Sciences*, 104(1): 203-207.
- Finnoff, D.**, J.F. Shogren, B. Leung, and D. M. Lodge. 2007. Take a risk - preferring prevention over control of biological invaders. *Ecological Economics*, i62:216-222.
- Potapov, A., M. Lewis and **D. Finnoff**. 2007. Optimal Control of Biological Invasions in Lake Networks. *Natural Resource Modeling*, 20(3): 351-379.
- Finnoff, D.** and J. Tschirhart. 2007. Using Oligopoly Theory to Examine Individual Plant versus Community Optimization and Evolutionary Stable Objectives, *Natural Resource Modeling*, 20(1): 61-85.
- McIntosh, C.R., J.F. Shogren and **D.C. Finnoff**. 2007. Invasive Species and Delaying the Inevitable: Results from a Pilot Valuation Experiment. *Journal of Agricultural & Applied Economics*, (October 2007) :81-93.
- Finnoff, D.**, C. Settle, J.F. Shogren and J. Tschirhart. 2006. Invasive Species and the Depth of Bioeconomic Integration. *Choices: The Magazine of Food, Farm & Resource Issues*, 21(3): 147-151.
- Finnoff, D.**, J.F. Shogren, B. Leung, and D. M. Lodge. 2005. The Importance of Bioeconomic Feedback in Nonindigenous Species Management. *Ecological Economics*, 52(3): 367-381.

- Finnoff, D.** and J. Tschirhart. 2005. Identifying, Preventing and Controlling Successful Invasive Plant Species Using their Physiological Traits. *Ecological Economics*, February, **52**(3), 397-416.
- Finnoff, D.**, J.F. Shogren, B. Leung, and D. M. Lodge. 2005. Managing Invasive Species: Rules of Thumb for Rapid Assessment. *Ecological Economics*, **55**: 24– 36.
- Finnoff, D.**, J.F. Shogren, B. Leung, and D. M. Lodge. 2005. Risk And Nonindigenous Species Management. *Review of Agricultural Economics*, **27**(3): 475-482.
- Finnoff, D.**, C. Cramer and S. Shaffer. 2004. "The Financial and Operational Impacts of FERC Order 636 on the Interstate Natural Gas Pipeline Industry" *Journal of Regulatory Economics*, **25**(3): 243-270.
- Finnoff, D.** and J.F. Shogren. 2004. Endogenous Risk As A Tool For Nonindigenous Species Management." *Weed Technology*, **18**:1261–1265.
- Finnoff, D.** and J. Tschirhart. 2003. Protecting an Endangered Species While Harvesting its Prey in a General Equilibrium Ecosystem Model. *Land Economics*, **70**, no. 2 (May):160-180.
- Finnoff, D.** and J. Tschirhart. 2003. Harvesting in an Eight Species Ecosystem. *Journal of Environmental Economics and Management*, **45** (May):589-611.
- Leung, B., D.M. Lodge, **D. Finnoff**, J.F. Shogren, M. Lewis, and G. Lamberti. 2002. An Ounce of Prevention or a Pound of Cure: Bioeconomic Risk Analysis of Invasive Species. *Proceedings: Biological Sciences*, **269**, no. 1508: 2407-2413.

### **Working Paper (Indicate those under submission)**

#### **Working Papers Under Submission and Requested Revision:**

“The Economic Case for a Global Pandemic Fund” (with Kevin Berry, Christopher Allen, Richard D. Horan, Jason F. Shogren, and Peter Daszak) invited for revision and resubmission, *EcoHealth*.

#### **Working Papers Under Review**

“Behavioral Origins of Epidemiological Bifurcations” (with D. Aadland and Kevin Huang) under review, *Macro Dynamics*.



### **Working Papers Being Prepared for Submission:**

- “Economics of Natural Gas Development with Reclamation and Environmental Bonding Requirements,” (with R. Coupal, Y. Igarashi, and M. Andersen) being prepared for submission, *Land Economics*.
- “Consequences of Space and Species, Aggregation in Welfare Estimates of Invasive Species” (with Stephanie Brockmann) being prepared for submission, *Journal of the Association of Environmental and Resource Economists*.
- “A hunter, a rancher, and a tourist encounter a grizzly. . .” (with Aaron Enriquez) being prepared for submission, *Journal of Environmental Economics and Management*.
- “Catastrophic Risk: Waking Up to the Reality of a Pandemic?” (with J. Pike, J.F. Shogren, K. Viscusi and P. Daszak) being prepared for submission, *Science*.
- “Wolf and Elk Management in a Spatial Predator-Prey Ecosystem” (with D. Aadland, Charles Sims and Jacob Hochard) being prepared for submission to the *American Journal of Agricultural Economics*.
- “Indirect management of malaria through land use change: an optimal control model of land conversion in Brazil,” (with Katie Lee and Peter Dasak) being prepared for the journal, *Journal of Economic Dynamics and Control*.
- “Ecosystem services portfolio predicts complex human welfare change following invasive species management” (with Matthew A. Barnes, Jenny L. Apriesnig, W. Lindsay Chadderton, Doran M. Mason, Edward S. Rutherford, Ali Shakoor, Travis W. Warziniack, Marion E. Wittmann, Hongyan Zhang, David M. Lodge) being prepared for the Journal, *Proceedings of the National Academy of Sciences*.

### **Books**

#### **Non-Refereed Journal Articles:**

- Shogren, J.F., **D.Finnoff, D**, C. McIntosh and C. Settle. 2006. Integration-Valuation Nexus in Invasive Species Policy. *Agricultural and Resource Economics Review*, 35(1): 11-20.

## Refereed Chapters in Books:

- Bossenbroek, J., A. Croskey, **D. Finnoff**, L. Iverson, S. McDermott, A. Prasad, C. Sims, D. Sydnor. Evaluating the Economic Costs and Benefits of Slowing the Spread of Emerald Ash Borer in Ohio and Michigan, in Keller, R., Cadotte, M., Sandiford, G. (Eds.), *Invasive Species in a Globalized World*. University of Chicago Press 2014.
- Finnoff, D, R.D. Horan, S.M. McDermott, C. Sims, J.F. Shogren, 2012. Economic Control of Invasive Species, in press, *Encyclopedia of Biodiversity - 2nd Edition*, edited by Simon Levin.
- Alexander, A. **D. Finnoff and J. F. Shogren**. 2011. Global Economics and Infectious Disease Emergence, in press, *Conservation Medicine: Applied Cases Of Ecological Health* edited by A. A. Aguirre, P. Dasak and R.S. Ostfeld, Oxford University Press.
- Finnoff D.**, M. A. Lewis and A. B. Potapov. 2009. Second best policies in invasive species management: when are they "good enough"? In C. Perrings, H. Mooney, and M. Williamson (Editors): *Bioinvasions and Globalization: Ecology, Economics, Management, and Policy*, Oxford University Press.
- Brock W.A., **D. Finnoff**, A.P. Kinzig, U. Pascual, C. Perrings, J. Tschirhart, A. Xepapadeas. 2009. Modeling Biodiversity And Ecosystem Services In Coupled Ecological-Economic Systems, in S. Naeem, D.E. Bunker, A.Hector, M. Loreau, and C.Perrings (Editors): *Biodiversity, Ecosystem Functioning, and Human Wellbeing*, Oxford University Press.
- Finnoff D. C.**, C. Settle, J.F. Shogren and J. Tschirhart. 2008. Integrating Economics and Biology for Invasive Species Management. In R. P. Keller, D. M. Lodge, M. A. Lewis, and J. F. Shogren (Editors): *Bioeconomics of Invasive Species*, Oxford University Press.
- McIntosh C. R., **D. C. Finnoff**, C. Settle, and J. F. Shogren. 2008. Economic Valuation and Invasive Species. In R. P. Keller, D. M. Lodge, M. A. Lewis, and J. F. Shogren (Editors): *Bioeconomics of Invasive Species*, Oxford University Press.
- Lewis M. A., A. B. Potapov, and **D. C. Finnoff**. 2008. Modeling Integrated Decision-Making Responses to Invasive Species. In R. P. Keller, D. M. Lodge, M. A. Lewis, and J. F. Shogren (Editors): *Bioeconomics of Invasive Species*, Oxford University Press.
- Bossenbroek J. M., **D. C. Finnoff**, J. F. Shogren and T. W. Warziniack. 2008. Advances in Ecological and Economic Analysis of Invasive Species: Dreissenid Mussels as a Case Study. In R. P. Keller, D. M. Lodge, M. A. Lewis, and J. F. Shogren (Editors): *Bioeconomics of Invasive Species*, Oxford University Press.
- Finnoff, D**, J.F. Shogren, B. Leung, and D. M. Lodge. 2007. Prevention versus Control in Invasive Species Management, in A. Kontonlean, U. Pascual, and T. Swanson (Editors): *Frontiers of Biodiversity Economics*, Cambridge University Press.
- Finnoff, D**, and J. Tschirhart. 2005. Inserting Ecological Detail into Economic Analysis: Agricultural

Nutrient Loading of an Estuary Fishery. Forthcoming 2008 in a book commissioned by V. Kerry Smith, publisher undecided.

**Non-Refereed Chapters in Books:**

**Refereed Proceedings/Transactions:**

**Non-Refereed Proceedings/Transactions:**

**Other (e.g. lab texts, book reviews, technical reports, in-house reports):**

“Economic feasibility of rare earth element (REE) extraction from Wyoming coal ash/char,” Final Report to the State of Wyoming (with Aaron Enriquez and Fred McLaughlin) June 2016.

“Developing a Framework for the Use of Computable General Equilibrium Economic and Ecological Models for Fisheries Management in the Chesapeake Bay” Final Report to Maryland Sea Grant (With John Tschirhart and Brad Gentner) August 2013.

“Ecological Forecasting and Risk Analysis of Nonindigenous Species” Final Report the NSF (with D.M. Lodge, J.F. Shogren, M. Lewis, H. MacIsaac and G. Lamberti) January 2010.

“Evaluating the Economic Costs and Benefits of Slowing the Spread of Emerald Ash Borer in Ohio and Michigan” Final Report to ERS/USDA PREISM Grant (with Jon Bossenbroek, Louis Iverson, Davis Sydnor, Anatha Prasad, Charles Sims and Shana McDermott) December 2009.

“Regional Economic Impacts of Coal Bed Methane Water Management” Final Report to the U.S. Department of Energy (with Roger Coupal) December 2008.

“Economic impact of ballast-mediated invasive species in the Great Lakes” Final Report to Sea Grant (with D.M. Lodge, J. D. Rothlisberger and R.M. Cooke) August 2008.

“Developing an Integrated Regional Economic-Ecological Model of Alaska Fisheries” Final Report to Alaska Fisheries Science Center, Pacific States Marine Fisheries Commission (with Min Gong and John Tschirhart) September 2007.

“Aquatic nuisance species-evaluating the ecological and economic value of the 100th Meridian Initiative” Final Report to Sea Grant (with D.M. Lodge and J.F. Shogren) May 2006.

“Integrating Economics and Biology for Bioeconomic Risk Assessment/Management of Invasive Species in Agriculture” Final Report ERS/USDA PREISM Grant (With Jason F. Shogren, John Tschirhart, Chad Settle and Brian Leung) March 2007.

## **CONTRACTS & GRANTS**

### **Submitted Project Proposals as PI or CoPI**

**Title (proposed):** A Bioeconomic Approach to Managing Brucellosis and CWD risks in the Greater Yellowstone Area

**Funding Agency (proposed):** National Institute of Food and Agriculture; U.S. Department of Agriculture

**Award (proposed):** \$500,000

**Duration (proposed):** 8/16/18 – 8/15/21

**Objectives and Approach (proposed):** Long-term objective is to understand how society can invest in the prevention and control of infectious pathogens in valued domestic and wild populations, so as to maximize long-run economic values associated with livestock agriculture and wildlife. Focus is on the Greater Yellowstone Area (GYA), as GYA elk and bison represent the last reservoir of brucellosis in the country, and elk are a dual disease threat due to close proximity of chronic wasting disease (CWD), which could pose additional risks. Understanding how to best manage this portfolio of disease risks requires sufficient knowledge about the economics of wildlife and livestock disease system interactions. Specific research activities include evaluating the management of GYA elk feedgrounds for disease control relative to other mitigation and adaptation efforts, evaluating the importance of spatial considerations in managing a multi-species disease problem, evaluating the management implications of a portfolio of disease risks (brucellosis and CWD), and understanding how GYA stakeholders might be affected by efficient disease management strategies.

**Title (proposed):** Risk, perception and resilience of coupled natural and human systems to aquatic invasive species along an invasion gradient

**Funding Agency (proposed):** National Science Foundation

**Award (proposed):** \$1,600,000

**Duration (proposed):** 1/1/2018-12/31/2021

**Objectives and Approach (proposed):** This proposed project will investigate the dynamic responses of coupled natural and human system (CNHS) to two invasive species, with a particular focus on identifying the attributes of both natural and human systems that contribute to risk, resiliency and vulnerability in the face of this disturbance. To address this general research objective, this proposed project will study the response of linked human and freshwater communities to bighead and silver carp (collectively, bigheaded carp or “BC”) along an invasion gradient ranging from pre-invasion to an established population of reproducing adults. Insights from this study will help to (i) predict the response of the freshwater ecosystem to BC at different points along an invasion gradient; (ii) predict the influence of risk perceptions, cost/benefit tradeoffs, and experience with BC on manager and stakeholder responses to BC; (iii) understand how ecosystem characteristics interact with management options to influence the resilience of freshwater ecosystems to an invasive species; and (iv) make more broadly applicable predictions about the capacity of a coupled natural and human system to adapt to invasion and how feedback between these components can enhance or interfere with this capacity.

## Newly Funded and Continuing Projects as PI or CoPI

**Title:** Forecasting biological and economic impacts of aquatic invasive species in Lake Michigan

**Funding Agency:** Great Lakes Fishery Trust

**Award:** \$246,818

**Duration:** 10/28/2015-10/27/2017

**Objectives and Approach:** The overall goal of the project is to enhance and improve bioeconomic modeling frameworks to inform fisheries management and policy response to invasive species. There are 6 specific project objectives are to:

1. Develop and adapt the Atlantis Lake Michigan model for invasion scenario simulations.
2. Develop an aggregation methodology to consistently couple existing recreational demand modeling with the broader scale, non-spatially explicit model of the regional economy (CGE model).
3. Couple the ecological and economic models.
4. Use the coupled models to evaluate the ecological and economic consequences of existing and potential invasive species (for example invasions of Silver Carp and Bighead Carp).
5. Use the coupled models to evaluate the ecological and economic consequences of invasion control scenarios to allow managers and agencies to weigh the potential value of policies such as development of underwater facilities cleanup of dreissenids, and reducing salmonid stocking to balance predator demand with prey supply.
6. Use the coupled models to evaluate the ecological and economic consequences of policies that create win-win opportunities, for example through fostering the highly valued salmonid fishery.

**Title:** Economic feasibility of rare earth element (REE) extraction from Wyoming coal ash/char

**Funding Agency:** Rare Earth Elements Research (REER), School of Energy Resources (SER), UW

**Award:** \$64,021

**Duration:** 9/1/2015 – 6/15/2016

**Objectives and Approach:** As the future of this coal has become a contentious issue, the State of Wyoming has recognized the importance of diversifying its coal industry. Recent research has indicated the potential for coal by-products such as fly ash to contain recoverable amounts of rare earth elements (REE). A companion proposal, submitted to SER, investigates the geochemical character of Wyoming coal ash to determine if REE exists in significant quantities. Yet, what remains to be shown is whether or not these quantities are economically viable. This proposal intends to complete the loop and investigate the economic viability of the companion studies findings. Specifically, the economic feasibility of the REE concentrations will be conducted by a net present value assessment of the exploitation of the concentrations in light of the available stock of coal ash in Wyoming, current and expected REE prices, and the costs necessary to extract REE from coal ash.

**Title:** US-UK Collab: RISKS OF ANIMAL AND PLANT INFECTIOUS DISEASES THROUGH TRADE (RAPID Trade)

**Funding Agency:** National Science Foundation

**Award:** \$2,000,000 total, \$148,773 to UW

**Duration:** 10/1/2014 – 9/30/2018

**Objectives and Approach:** The project has 4 main aims:

- To improve understanding of the disease risks involved in importers' responses to disease risks and the interventions they induce,

- To use this information to develop trade-risk assessment methods that can enhance national disease risk management,
- To improve capacity to predict the implications of trade responses and trade interventions for the wider risk landscape, and to explore options for managing this at the international scale,
- To develop a virtual laboratory with which to test the effects of alternative incentive-based disease risk management strategies at multiple scales.

## **Continuing Projects as Subcontractor**

### **Previously Funded Projects as PI or CoPI**

**Title:** Forecasting spread and bioeconomic impacts of aquatic invasive species from multiple pathways to improve management and policy in the Great Lakes

**Funding Agency:** NOAA

**Award:** \$2,500,000

**Duration:** September 2009-August 2014

**Objectives and Approach:** There are six major goals of the project. 1) To forecast the probability of establishment of nonindigenous species into the GL via three major pathways: (a) shipping; (b) organisms in trade; and (c) canals, especially the Chicago Sanitary & Ship Canal. For each of these pathways, propagule pressure—the rate of introduction of individuals of these species into the GL—will be estimated from surveys of the literature and surveys of retail and consumer behavior, and the probability of establishment estimated. 2) To forecast the potential habitat of species within the Great Lakes, investigators will use multiple ecological niche models, based on new GIS layers (produced by the project) of habitat and species distributions for all the GLs. 3) To forecast the potential spread of invaders within the GL investigators will compare natural background dispersal (predicted by current models) to that predicted by oceanic ships, laker ships, and recreational boaters. 4) To forecast ecological impacts, researchers will use two general approaches: (a) statistical and computational models based on species; and (b) food web modeling to develop quantitative scenarios of ecological impacts, with uncertainties specified via structured expert judgment. 5) To forecast regional economic impact, researchers will link the food web models to a GL regional economic model (a computable general equilibrium model) to account for the feedbacks between ecological and economic systems, and quantitatively value ecosystem goods and services affected by invasive species. 6) Finally, in collaboration with management partners throughout the project, investigators will use the linked ecological and economic models to evaluate alternative management strategies with holistic cost-benefit analyses that focus on preventing species introduction, early detection and rapid response (EDRR) efforts, slow-the-spread strategies, and integrated control options.

**Title:** Predicting the Disease-Risks of International Commerce and Trade

**Funding Agency:** National Science Foundation

**Duration:** 10/1/11– 9/30/2015

**Award:** \$2,500,000

**Objectives and Approach:** This collaborative international proposal brings together a novel mix of epidemiological and socioeconomic approaches to address the link between globalization and emerging infectious disease risks. It will answer the overarching research question: how does international trade affect human, animal and plant disease risks? In so doing, it will generate

methods and data to understand and predict the disease risks of trade growth as a function of the ecology of infectious and vector-borne diseases, national sanitary and phytosanitary (SPS) measures, the characteristics of markets and human behavior in those markets. Aside from deepening the science disease transmission, it should strengthen both national disease control and the coordination of international effort to mitigate disease risks.

**Title:** Wyoming Natural Gas: Past and Future Challenges (With Charles Mason)

**Funding Agency:** School of Energy Resources (UW)

**Award:** \$300,000

**Duration:** August 2012-August 2014

**Objectives and Approach:** The fate of Wyoming natural gas, its relative marketability and key end markets remains uncertain; depending on the resolution of the potential changes in both demand and supply, a wide range of possible market scenarios might emerge over the course of the next 5-10 years. We propose to extend our current research program to consider the affects of these massive changes for the future of Wyoming natural gas. Specifically our research project will build on our previously sponsored research to answer the critically important question: How will changing supply and demand conditions in the market for natural gas affect Wyoming natural gas prices and pipeline congestion? Because the rapid evolution of both demand and supply opens up the potential for relatively dramatic changes in the natural gas market, we believe answering the key research question requires a flexible and creative approach. We propose to use cutting edge advances from evolutionary game theory and agent based modeling to simulate natural gas markets under various future scenarios. With these tools, we anticipate developing a very flexible model that will allow the investigation of the potentially wide range of market constellations. Armed with the results from these simulations, we will construct a best estimate as to future conditions, together with information over the plausible range of outcomes.

**Title:** The Evolution of Energy Markets over Time: An Examination of OPEC, the Seven Sisters, and Oil Market Dominance Through the Use of Evolutionary Game Theory and Agent-Based Modeling

**Funding Agency:** UW COB

**Duration:** Fall 2013 Through Summer 2014

**Award:** \$10,000

**Objectives and Approach:** Objective is to use applied evolutionary game theory and agent-based modeling to explain how world petroleum markets evolved over the course of the 1960s and 1970s. This turbulent epoch remains theoretically unexplained; its description is solely anecdotal, perhaps due to the limitations of standard economic modeling.

**Title:** Cost-sensitive machine learning algorithms for invasive species decision support, risk analysis, and policy

**Funding Agency:** U.S.D.A. ERS

**Award:** \$250,000

**Duration:** January 2009-December 2011

**Objectives and Approach:** The overall goal of the proposed research is to develop cost-sensitive decision support tools (classification algorithms and visual decision trees) and parameterize them with empirical data to aid risk analysis for newly reported imported plant species and species proposed for future introduction. In contrast to previous studies, the proposed approach will incorporate expected costs in algorithm identification to minimize expected damages rather than total errors. Supporting objectives are to: (1) develop a database of introduced species and their characteristics to be used for this study and to be archived in publicly accessible data repositories for benchmarking future developments; (2) develop theoretical and empirical models for cost/benefit distributions of weeds; and (3) use nonparametric

distribution estimation techniques and unsupervised learning algorithms to detect and discriminate classes of weeds with respect to mode and magnitude of impact and biological features. To accomplish our overall goal, we will apply machine learning algorithms (neural nets, kernel-based learning algorithms, distribution estimation, nearest neighbor generalization, dissimilarity metrics, etc.) implementing techniques for variable selection and model combination to reduce complexity and dependence on data that are difficult to obtain while increasing accuracy. These decision support tools will be useful to weed risk analysis.

**Title:** Evaluating the economic costs and benefits of slowing the spread of the emerald ash borer in Ohio and Michigan

**Funding Agency:** U.S.D.A. ERS

**Award:** \$250,000

**Duration:** January 2007-December 2008

**Objectives and Approach:** The project objectives are two-fold: 1) to provide estimates of the regional economic impact the emerald ash borer will potentially inflict upon the ash forestry in Ohio and Michigan; 2) and to provide policy-makers with quantitative guidance for cost-effective alternative strategies to control, prevent or slow the spread of emerald ash borer. Finnoff will be responsible for: (1) Estimating the current value of the ash forestry and its regional labor and capital employment in a spatially explicit manner. (2) Determining the regional economic consequences of emerald ash borer spread through the development of a regional Computable General Equilibrium (CGE) model. The overall second objective will be addressed by developing scenarios for the CGE based on alternative control and prevention strategies for the spread of emerald ash borer. First, we will determine the cost and effectiveness of different strategies for the control of the emerald ash borer. Second, using the CGE model linked to the distribution and spread models we will optimize the use of resources to reduce the costs that will potentially be incurred by the forestry industry. Thus, our study will not only provide the best quantification possible of the impact of the emerald ash borer; it will also provide the opportunity to test the value of alternative policy scenarios.

**Title:** Developing an Integrated Regional Economic-Ecological Model of Alaska Fisheries

**Funding Agency:** Pacific Fisheries Marine Fisheries Commission (PSMFC)

**Award:** \$45,644

**Duration:**

**Objectives and Approach:** The objective of this project is to develop an integrated ecological/economic model for Alaska fisheries that can track both ecological relationships and human activities. The ecosystem model developed will be combined with a regional economic model such as computable general equilibrium (CGE) model. Such an integrated ecosystem approach will provide more useful information to policy-makers than stand-alone regional economic or ecological models for fisheries, and better satisfy the National Standard 8 (NS8). The resulting integrated model from this research will serve as a decision-making tool for fishery management actions.

**Title:** Developing an Integrated Regional Economic-Ecological Model of Alaska Fisheries: Preliminary Work

**Funding Agency:** Pacific Fisheries Marine Fisheries Commission (PSMFC)

**Award:** \$21,738

**Duration:** June 2005 to September 2005

**Objectives and Approach:** The goal of this project is to begin the development of an integrated ecological/regional economic model for Alaska that can serve as a decision-making tool for Ecosystem Approach to Management (EAM) and for better satisfying National Standard 8 (NS8). In this preliminary work the research focused on establishing the breadth of the ecosystem and regional economic models,



determining the data needs, and identifying the data sources.

**Title:** Economic impact of ballast-mediated invasive species in the Great Lakes

**Funding Agency:** SEA GRANT NATIONAL STRATEGIC INVESTMENT IN AQUATIC INVASIVE SPECIES RESEARCH & OUTREACH

**Award:** \$448,664

**Duration:** June 2005 – May 2007

**Objectives and Approach:** The primary goal is to determine the costs nonindigenous species have imposed on the economy of the Great Lakes region as a result of oceanic shipping, and compare that to the benefits of oceanic shipping determined by a separate study. Under this overall goal are five specific objectives: 1) Determine the ecological changes caused by 22 nonindigenous species that were introduced and established in the Great Lakes via ship ballast discharges; 2) Quantify the minimum net financial cost (based on market costs) imposed on the Great Lakes region by the same 22 species; 3) For a subset of high risk species, forecast their potential range in North America; 4) Assess how unquantified costs (for currently unstudied species, for market costs imposed outside the Great Lakes region, for non-market costs imposed within and outside the Great Lakes region) might change our evaluation of the net cost of the species and net value of shipping; and 5) Develop policy recommendations and an outreach strategy to inform the public and policy-makers as decisions are made about the management of ballast and the St. Lawrence Seaway.

**Title:** Ecological Forecasting and Risk Analysis of Nonindigenous Species:

Strategic Optimization using a Bio-Economic Approach (with J. F. Shogren, G. Lamberti, B. Leung, M. A. Lewis, and D. M. Lodge)

**Funding Agency:** NSF

**Award:** Total award of \$2,989,645

**Duration:** September 2003 – August 2007

**Objectives and Approach:** The objective is to develop and apply a bio-economic modeling framework for nonindigenous species that integrates risk assessment and risk management, includes uncertainty distributions, and optimizes prevention and control strategies in a landscape context. The overall bio-economic model allows ecological-economic feedbacks to be incorporated in such a way to optimize combinations of prevention and control strategies to maximize social welfare. The applications focus on freshwater nonindigenous species in the Great Lakes region.

**Title:** Predicting and Valuing Species Populations in an Integrated Economic/Ecosystem Model (with J. Tschirhart)

**Funding Agency:** U.S. EPA

**Award:** Total award of \$203,176

**Duration:** June 2003 – May 2005 (Extended to January 2006)

**Objectives and Approach:** The threefold objective is to: 1) predict how species' populations in an ecosystem are changed by economic activity, 2) value these population changes, and 3) predict how the population changes impact economic activity. The objective will be accomplished by using a new, tightly integrated economic/ecological model. The approach develops a computable general equilibrium ecosystem model (GEEM), and combines GEEM with a computable general equilibrium (CGE) economic model to obtain one seamless, integrated bioeconomic model. A marine ecosystem in the Eastern Bering Sea and the Alaskan economy provide the application.

**Title:** Aquatic Nuisance Species - Evaluating the ecological and economic value of the 100th Meridian Initiative (with J. F. Shogren, G. Lamberti, B. Leung, M. A. Lewis, and D. M. Lodge)

**Funding Agency:** Sea Grant

**Award:** Total award of \$494,765

**Duration:** June 2003 – May 2005 (Extended to January 2006)

**Objectives and Approach:** The objective is to provide quantitative guidance for government or private investments in alternative strategies to prevent the establishment of zebra mussel in the western United States. The approach forecasts what reaches of three major western river basins (the Colorado, the San Joaquin and the Columbia) are invulnerable to zebra mussels, broadly evaluates what environmental and economic damages would result should zebra mussel invade those reaches, and using a bioeconomic model determines optimal investments in different prevention strategies.

**Title:** Integrating Economics and Biology for Bioeconomic Risk Assessment / Management of Invasive Species in Agriculture (with C. Settle, J.F. Shogren, J. T. Tschirhart, B. Leung, and D. Lodge)

**Funding Agency:** U.S.D.A. ERS

**Award:** Total award of \$250,000

**Duration:** September 2003 – September 2005 (Extended to summer 2006)

**Objectives and Approach:** Three bioeconomic modeling approaches with economic and biological feedbacks are compared and contrasted in their ability to answer key questions on how to allocate society's resources toward invasive species in agriculture, and how to allocate it between prevention and control. All three approaches are applied to a case study of the invasive weed leafy spurge and its spread across rangeland in Wyoming, the Dakotas and Montana to provide quantitative guidance for cost-effective investments in alternative strategies.

**Title:** Economic Valuation of Water Storage in Reservoirs in South Florida (initiated and completed at the University of Central Florida with J.W. Milon, O. Nnadi, M. Wanielista, and G. Yeh)

**Funding Agency:** Florida Department of Environmental Protection and the South Florida Water Management District

**Award:** \$250,000

**Duration:** June 2002 – May 2003

**Objectives and Approach:** The objective of this contract was the development of conceptual and empirical models to estimate the economic value of water storage in reservoirs in South Florida. A dynamic optimization model was developed to identify the conceptual principles to value water storage and the economic variables to be measured. Empirical work included storage demand and cost estimation for the specific geographic region investigated. The research team also developed an integrated hydrological and economic analysis used in the final assessment of storage options.

## **PROFESSIONAL AFFILIATION AND ACTIVITIES**

Clearly differentiate editorial positions (e.g. journal editor/associate editor) from manuscript and grant refereeing.

### **Editor (Co-):**

Environmental and Resource Economics  
Resource and Energy Economics (starting spring 2018)

### **Editor (Associate):**

Frontiers in Ecology and the Environment

### **Referee:**

*Nature, Theoretical Ecology, Journal of Economic Dynamics and Control, American Journal of Agricultural Economics, Biological Invasions, Ecological Economics, Environmental and Resource Economics, Environment and Development Economics, Journal of Environmental Economics and Management, Journal of the Association of Environmental and Resource Economists, Marine Resource Economics, Natural Resource Modeling, Journal of Environmental Management, Frontiers in Ecology and the Environment, Conservation Biology, Resource and Energy Economics, Journal of Economic Theory, Resource and Agricultural Economics, Journal of Agricultural Economics, Applied Mathematical Modelling, Environmental Management, European Review of Agricultural Economics, Economic Systems Research, Sustainability, Society and Natural Resources, Annual Review of Resource Economics, Journal of Mathematical Biology, Journal of Theoretical biology, Journal of Economic Geography, Journal of Economic Behavior and Organization, Economic Systems Research*

## **HONORS AND AWARDS**

Named a “Top Prof” for the 2017 academic year by University of Wyoming Cap and Gown Chapter of Mortar Board.

2014, 2015, 2017 College of Business Advisory Board (COBAB) Faculty Award. The award recognizes the best all round faculty member for the academic year in teaching, research, and service.

College of Business Outstanding Senior Service Award, University of Wyoming 2015-2016.

College of Business Outstanding Senior Research Award, University of Wyoming 2011-2012, 2014-2015.

2014 John P. “Jack” Ellbogen Meritorious Classroom Teaching Award.

Outstanding Publication in the *Journal Environmental and Resource Economics*:

Travis Warziniack, David Finnoff, Jonathan Bossenbroek, Jason F. Shogren and David Lodge (2011) Stepping Stones for Biological Invasion: A Bioeconomic Model of Transferable Risk, *Environmental and Resource Economics*, Volume 50, Number 4, 605-627.

University of Wyoming Outstanding Advisor Award, Mortar Board Honor Society, 2011-2012.

Invited to speak at the College of Business Showcase, October 2011.

College of Business Outstanding Senior Teaching Award, University of Wyoming 2010-2011.

Named a "Top Prof" for the 2010 - 2011 academic year by University of Wyoming Cap and Gown Chapter of Mortar Board.

Named a "Top Prof" for the 2009 - 2010 academic year by University of Wyoming Cap and Gown Chapter of Mortar Board.

College of Business Outstanding Junior Research Award, University of Wyoming, 2007-2008.

Winner of the 2007 Tom and Judy Crocker Prize in Economics and Finance, College of Business, University of Wyoming for the paper *Syphilis Cycles* (with David Aadland).

Invited to be an Associate Editor (then Co-Editor) and on the Editorial Board, Environment and Resource Economics.

Invited to be an Associate Editor and on the Editorial Board, Frontiers in Ecology and the Environment.

Invited to be a Member of the Editorial Council, Journal of Environmental Economics and Management.

College of Business Outstanding Junior Research Award, University of Wyoming, 2005-2006.

Elected to be Director of Undergraduate Studies, Department of Economics and Finance, College of Business, University of Wyoming.

Commissioned by Professor V.K. Smith (North Carolina State University) to write a paper for a joint NSF/EPA grant on biocomplexity and economic modeling of ecological systems, 2004.

Carl H. Galloway Faculty Performance Incentive Award for Graduate Research, University of Central Florida, 2003

Research Associate - EPA-EPSCoR Grant, University of Wyoming, 1998

Outstanding Graduate Student Award - Public Utility Research and Training Institute,

University of Wyoming, 1996, 1997

**PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/ PROFESSIONAL MEETINGS/  
WORKSHOPS**

“Catastrophic Risk: Waking Up to the Reality of a Pandemic?” Invited seminar at Arizona State University, AZ, October 2017.

“Catastrophic Risk: Waking Up to the Reality of a Pandemic?” Invited seminar at The University of Alaska, AK, October 2017.

“Behavioral Origins of Epidemiological Bifurcations,” Seminar at Michigan State University, MI, January 2017.

“Natural vs Anthropogenic Risk Reduction: Facing Invasion Risks Involving Multi-Stable Outcomes,” Association of Environmental and Resource Economists (AERE) annual meeting, Breckenridge, CO, June 2016.

“Natural vs Anthropogenic Risk Reduction: Facing Invasion Risks Involving Multi-Stable Outcomes,” Seminar at University of York, England, UK, March 2016.

“Managing Wildlife Faced with Pathogen Risks Involving Multi-Stable Outcomes,” - 17th BIOECON Conference on Resource Economics, Biodiversity Conservation and Development, Cambridge University, England, September 2015.

“Using Behavioral Ecology for Management of Ecosystem Services,” Association of Environmental and Resource Economists (AERE) annual meeting, San Diego, CA, June 2015.

“Opposing irreversibilities in environmental policy: Avoiding the point of no return or delaying the inevitable,” Association of Environmental and Resource Economists (AERE) annual meeting, San Diego, CA, June 2015.

“Bioeconomics of Invasive Species: Integrating ecology, economics and management,” International Conference on Global Plant Health Risks and Consequences: Linking Science, Economics and Policy (OECD), York, England, October 2014.

Scientific Committee Meeting for *The ecoHEALTH project*, DIVERSITAS Future Earth Meeting, Sevilla, Spain, September 2014.

“Opposing irreversibilities in environmental policy: Avoiding the point of no return or delaying the inevitable” American Fisheries Society Annual Meeting, Quebec, Canada August 2014.

“Managing the Endogenous Risk of Disease Outbreaks with a Non-Constant Background Hazard Rate” MASpread Annual Workshop, Princeton, New Jersey, April 2014.

- “Framework for a Coupled Ecological-Economic Model of the Chesapeake Bay Watershed” (with John Tschirhart) Chesapeake Bay Sustainable Fisheries Goal Implementation Team, Solomons, Maryland, December 2013.
- “Framework for a Coupled Ecological-Economic Model of the Chesapeake Bay Watershed” (with John Tschirhart) invited talk at NOAA Headquarters, Silver Spring, Maryland, December 2013.
- “Managing the Endogenous Risk of Disease Outbreaks with a Non-Constant Background Hazard Rate” Association of Environmental and Resource Economists (AERE) annual meeting, Banff Canada, June 2013.
- Discussant, BESTNet Workshop - Modeling Species Dispersal & Ecosystem Services, Princeton, April 2013.
- “The Dynamics of Economic Epidemiology Equilibria” Association of Environmental and Resource Economists (AERE) annual meeting, Ashville NC, June 2012.
- “Spatial Dynamics of Optimal Management in a Predator-Prey System: An Application to Mountain Pine Beetle Epidemics” (presented by Dave Aadland) Association of Environmental and Resource Economists (AERE) annual meeting, Ashville NC, June 2012.
- “How Ecosystem Service Provision Can Increase Forest Mortality from Insect Outbreaks.” (presented by Charles Sims) Ecosystem Services Partnership Conference: Portland, OR, July31-August 4, 2012.
- “Inserting a SEJ into a CGE” Second meeting of Ecological Forecasting Group from the University of Notre Dame, Chicago, October 2011.
- "The Welfare Impacts of an Invasive Species: Endogenous vs. Exogenous Price Models" (presented by Shana McDermott) Southern Economic Association (SEA) annual meeting, Washington D.C., November 2011
- “Evaluating the risk of EIDs emerging from global trade” EcoHealth Alliance, New York, March 2011.
- “Modeling economic impacts of climate change and ocean acidification to fisheries” USEPA Climate Damages Workshop, January 2011.
- “The Role of Spatial Scale in the Timing of Uncertain Environmental Policy” (presented by Charles Sims) Annual Allied Social Sciences (ASSA) meetings, Denver, January 2011.
- “Great Lakes Ecosystem Services” seminar at University of Notre Dame, October 2010.

- “The Dynamics of Optimally Delaying and Controlling a Spreading Invader” invited seminar, Colorado State University, September 2010.
- “Spatial scale and the implementation and timing of uncertain environmental policy” World Congress of Environmental and Resource Economists, Montreal, June 2010.
- “Evaluating the risk of EIDs emerging from global trade” invited seminar, Brown University, May 2010.
- “A bio-economic modeling framework to evaluate the risk of EIDs emerging from the global trade in live animals” DIVERSITAS OC2 meeting, Cape Town, South Africa, October 2009.
- “Managing the Risks of Emerging Infectious Diseases” Synthesizing and Predicting Infectious Disease while accounting for Endogenous Risk (SPIDER) meeting, Knoxville Tennessee, June 2009
- “Managing the Risks of Invasive Species” Odum Conference, Rensselaerville New York, April 2009.
- “Impact of Ship-borne Invasions on the Great Lakes Regional Economy” American Association for the Advancement of Science (AAAS) annual meeting, Chicago Illinois, February 2009.
- “The Dynamics of Prevention and Control in the Optimal Management of a Spreading Invader” Spatial Environmental Economics Workshop, Centennial Wyoming, September 2008.
- “Modeling the economics of invasive diseases: Human Behavior and Syphilis Cycles” BESTNet – DIVERSITAS - AgTrans Workshop , Global Institute of Sustainability, Arizona State University, Tempe Arizona, May 2008.
- “A Bioeconomic Model of Cattle Stocking on Land Threatened by Invasive Plants and Nitrogen Deposition” PREDICTING INVASIVE POTENTIAL OF EXOTIC SPECIES, IGERT-MN Futures Symposium, University of Minnesota, March 2008.
- “Stationary Policies in the Control of Invasive Species” BESTNet/DIVERSITASecoSERVICES Workshop ECONOMIC AND ECOLOGICAL SCIENCE AND MANAGEMENT OF INVASIVE SPECIES, Global Institute of Sustainability, Arizona State University, Tempe Arizona, October 2007.
- “Optimal and Close to Optimal Management of a Spreading Invader” Economics of Invasive Species in the Great Lakes, Michigan State University, October 2007.
- “Eradication and the Optimal Management of a Spreading Invader” Ecological Society of America Annual Meeting, San Jose California, August 2007.

“Joint Determination to Assess the Economic Importance of Ecosystem Services” AERE Annual Workshop: Valuation and Incentives for Ecosystem Services, Mystic Connecticut, June 2007.

“Integrated Bioeconomic Modeling of Invasive Species Management” USDA ERS PREISM Workshop, Washington D.C. October 2006.

“Stemming Aliens: Preventing the Spread of Multiple Invaders” Research Seminar, College of Business, University of Wyoming, March 2006.

“Stemming Aliens: Preventing the Spread of Multiple Invaders” WWS Annual Meeting, Reno, NV, March 2006.

“Evaluating the 100th Meridian Initiative: What is it worth to keep zebra mussels out of the Columbia River?” and “Economic Benefits From Risk Management of Invasive Species” Professor Donald McCleod’s Agriculture Economics Senior Seminar class, University of Wyoming, January 2006.

Discussant, Annual Meeting Allied Social Science Associations, Boston. January 2006.

Panel Economist, Workshop on Capacity Building on Sustainable Ornamental Fish and Aquaculture Practices for Aquatic Alien Species: Preventing Invasive Species Problems, Minneapolis, November 2005.

“Inserting Ecological Detail into Economic Analysis: Agricultural Nutrient Loading of an Estuary Fishery,” CU Environmental and Resource Economics Workshop, September 2005.

Participant, U.S. EPA Economic Impacts of Aquatic Invasive Species Workshop, Washington, DC, July 2005.

“Inserting Ecological Detail into Economic Analysis: Agricultural Nutrient Loading of an Estuary Fishery,” Commissioned paper, Conference on Linking Economic and Ecological Models for Environmental Policy Analysis: Challenges and Research Strategies. Santa Fe, New Mexico April 17 – 19, 2005.

“Risk and Nonindigenous Species Management,” Annual Meeting Allied Social Science Associations, Philadelphia. January 2005.

“A Micro Optimization Framework for Evaluating The Tradeoffs Between Nutrient Loading of Estuaries and Ecosystem Productivity,” DIVERSITAS workshop on "Integrated modelling of economies and ecosystems," Paris France, November 2004.

“A Micro Optimization Framework for Evaluating the Tradeoffs Between Nutrient Loading of Estuaries and Ecosystem Productivity,” Invited Presentation, North Carolina State University. November 2004.



- “Discounting, Risk Aversion, and Endogenous Risk in No indigenous Species Management,”  
Western Agricultural Economics Association Annual Meeting, Honolulu, Hawaii. July 2004.
- “Linking Dynamic Economic and Ecological CGE Models” 2004 University of Massachusetts,  
Amherst, Massachusetts.
- “Endogenous Risk as a Decision Framework for Invasive Species Management” 2003 7<sup>th</sup>  
International Conference on the Ecology and Management of Alien Plant Invasions, Fort  
Lauderdale, Florida.
- “General Equilibrium, Competition, and the Influence of Fundamental Resources:  
Identifying Redundant and Invasive Plant Species” 2003 7<sup>th</sup> International Conference on  
the Ecology and Management of Alien Plant Invasions, Fort Lauderdale, Florida.
- "Panel on Ecological / Economic Modeling Interactions: Linking Ecological and Economic  
Models: Dual Perspectives" 2003 Camp Resources XI, Wilmington, North Carolina.
- "A Multiple Species Bioeconomic Computable General Equilibrium Model" 2003 12th Annual  
Conference of the European Association of Environmental and Resource Economists,  
Bilbao Spain.
- "Developing a Methodology for Identifying Successful Invaders Among Competing Plants in a  
GE Ecosystem Model" 2003 University of Wyoming Conference on Bioinvasions,  
Laramie, Wyoming.
- "The Cost of Delaying Action: Examples from Ecosystem Management" (with Chad Settle) 2003  
University of Wyoming Conference on Bioinvasions, Laramie, Wyoming.
- "A Multiple Species Bioeconomic Computable General Equilibrium Model" Economics and  
The Environment in California, Chico State University, Chico, California.
- "The Economics of Everglade Restoration" (With J. Walter Milon) 2003 Economic Analysis for  
Environmental Resource Management and Planning in Florida, Orlando, Florida.
- "Harvesting in an Eight Species Ecosystem" 2002 Southern Economic Meetings, New Orleans,  
Louisiana.
- "Harvesting Prey while Protecting an Endangered Predator in a General Equilibrium Ecosystem  
Model" 2002 Appalachian State University, Boone, North Carolina.
- "Harvesting Prey while Protecting an Endangered Predator in a General Equilibrium Ecosystem  
Model" 2002 Camp Resources X, Wilmington, North Carolina.
- "Harvesting Prey while Protecting an Endangered Predator in a General Equilibrium Ecosystem

Model" 2002 CU Environmental and Resource Economics Workshop, Boulder Colorado.

"Harvesting in an Eight Species Ecosystem" 2002 University of Central Florida, Orlando, Florida.

"A General Equilibrium Model Of An Economy And Ecosystem: A Fisheries Example" 2001 Camp Resources IX, Wilmington, North Carolina.

"Integrating Economics And Ecology Through General Equilibrium Theory: The Case Of The Fishery" 2001 CU Environmental and Resource Economics Workshop, Breckenridge Colorado.

"Toward Merging Economics And Ecology" 2001 Appalachian State University, Boone North Carolina, 2001 World Conference on Natural Resource Modeling, Utah State University, Logan Utah.

"Harvesting in a Complex Ecosystem" 2000 European Association of Environmental and Resource Economists meetings, Rethymno, Crete, Greece.

"A Method for a Jointly Determined Economy and Ecosystem" 1999 Workshop on Integrating Economics and Ecology, University of Wyoming, Laramie, WY.

## **COMMITTEES**

If served as committee chairperson, please note.

### **Department Committees**

Course proposal committee  
Undergraduate program review committee  
Undergraduate assessment committee (Co-Chairperson)  
Environment and Resource Economics Field committee  
Graduate admissions committee  
Economics Comprehensive Exam Committee

### **College Committees**

College of Business Faculty Advisory Council (Vice-Chair)  
College of Business Accounting and Finance Chair Search Committee  
College of Business scholarship committee  
College of Business Core Curriculum Committee  
College of Business Tenure and Promotion Committee

### **University Committees**

ENR and College of Business Tourism and Recreation Curriculum Committee (Chair)  
University Exploratory Studies Degree Committee  
Honors College Dean Search Committee  
College of Engineering and Applied Science Dean Search Committee  
College of Business Dean Search Committee

**GRADUATE SUPERVISION**

List all graduate, postdoctoral students, and research associates who you have supervised during the last five years.

Current Graduate Advisees:

Current Graduate Committee Chairmanships:

2

Current Graduate Committee Memberships (excluding those chaired):

\_\_\_\_\_ # Plan B  
\_\_\_\_\_ # MS/MA  
0 \_\_\_\_\_ # PhD

Graduate Degrees Completed Under Your Supervision (past 5 years):

- Paul Kivi – PhD Economics (University of Wyoming – committee member)
- Sakib Mahmud– PhD Economics (University of Wyoming – committee member)
- Shana McDermott - PhD Economics (University of Wyoming - chair)
- Charles Sims - PhD Economics (University of Wyoming - chair)
- Abul Maala Tanvir Hussain – PhD Economics (University of Wyoming – committee member)
- Gerhard Hambusch - PhD Economics (University of Wyoming – co-chair with S. Shaffer)
- Travis Warziniack – PhD Economics (University of Wyoming – committee member)
- Min Gong – PhD Economics (University of Wyoming – committee member)
- Matthew Oliver – PhD Economics (University of Wyoming – Co-Chair)
- Jenny Johnson – MS Economics (University of Wyoming – Chair)
- Yoshiyuki Igarashi – MS Economics (University of Wyoming – Co-Chair)
- Jamison Pike – PhD Economics (University of Wyoming – Co-Chair)
- Aaron Wood – PhD Economics (University of Wyoming – Co-Chair)
- Kevin Berry – PhD Economics (University of Wyoming – Chair)
- Jacob Hochard – PhD Economics (University of Wyoming – Co-Chair)
- Anna Ohlschwager– MS Economics (University of Wyoming – Chair)
- Chad Lafever– MS Economics (University of Wyoming – Chair)
- Katie Lee – PhD Economics (University of Wyoming – Chair)
- Yasha Feferholtz – PhD Economics (University of Wyoming – committee member)
- Remi Martin - PhD Economics (University of Wyoming – committee member)

## **OTHER ACTIVITIES/ACCOMPLISHMENTS**

Advised all economics majors, con-current majors, double majors and minors, career advisor all business economics majors (advised or mentored approx 70 students fall 2011, 60 spring 2012, 75 fall 2012, 80 spring 2013, 90 fall 2013, 80 spring 2014, 95 fall 2014, 90 spring 2015, 105 fall 2015, 95 spring 2016, 92 fall 2016, 75 spring 2017, 81 fall 2017).

Session chair, REGULATORY ENFORCEMENT II, Association of Environmental and Resource Economists 5th Annual Summer Conference, Breckenridge, Colorado, June 2016.

Proposed, organized, and served as a coeditor (with Charles Sims and Charles Mason) the workshop "Thresholds, Tipping Points and Random Events in Dynamic Economic Systems," University of Tennessee, Knoxville, TN, July 2015.

Session chair and discussant, Conservation and Ecosystem Services, American Agricultural Economics Association annual meeting, Denver, July 2010.

Proposed, organized and implemented (with D. Peck) the session "Analyzing the Role of Agricultural Policies in Disease Emergence from Wildlife-Livestock Interactions" at The Pathways to Success: Integrating Human Dimensions into Fish and wildlife Management Conference in Estes Park, Colorado, September 2008.

Discussant on the paper "The Devil in the Details: Non-convexities in Ecosystem Service Provision" (by Gardner Brown, Trista Patterson and Nicholas Cain) at the Conference in honor of Thomas D. Crocker.