

Frontiers in Environmental & Natural Resource Economics 1
AAE 760
Spring 2021

Instructor:

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Taylor Hall, Room 413
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Virtual (Synchronous) Class Meetings:

Monday and Wednesdays, 9:30 – 10:45 a.m

Office Hours:

By appointment.

Class Website:

We will use Canvas. Check for Zoom links, announcements, readings, and assignments.

Course Description:

This course examines the operation of markets for natural resources, including fish, forests, wildlife, water, land, and fossil fuels. Special emphasis will be given to the role that resource governance, regulation, and property rights play in affecting resource use. The course is slightly multi-disciplinary because a basic understanding of natural science processes and property law are necessary for economic analysis. For this reason, the readings present simple biological models for studying fisheries, wildlife, and forests and incorporate geological and hydrologic concepts in examining minerals and water. The readings also describe ownership rights to resources, which often are not clearly defined. In these cases the interests of some potential resource users will not be reflected in market outcomes and the scramble or “race” to acquire un-owned resources is often wasteful. Because the use of some natural resources is ultimately linked to the release of waste into the environment, there are also considerations of environmental degradation that result from certain ownership regimes. We will encounter these themes throughout the course.

The readings and lectures will introduce the tools of resource economics, which differ from standard microeconomics because of the stronger emphasis on dynamic optimization. Important concepts include *open access*, *commons*, *anticommons*, *steady state*, *maximum sustained yield*, and *discounting*. Important tools include analytical models of optimal control and numerical simulation.

Useful Textbooks

Conrad, Jon M. 2010. *Resource Economics*, Cambridge University Press.

Conrad, Jon M. and Colin W. Clark. 1987. *Natural Resource Economics: Notes and Problems*, Cambridge University Press.

The Conrad and Clark book focuses on modelling methods, and spends relatively little time with institutional details or discussion of resource industries and policy issues. These topics will be treated in readings from journals and other books. The Conrad *Resource Economics* book is similar to Conrad and Clark, but a bit less technical in terms of modeling. It allocates more of the book to

discussing resource industries and policies and a fair amount of attention is given to simulation exercises.

Journal Articles

Much of the course content will come from classic and recent journal articles in natural resource economics. Some readings will be required, and some will be optional.

Grading and Course Structure:

Contributions as discussion leader	25%
Contributions as class participant	25 %
Problem sets	20 %
Research paper	30 %
Total	100 %

Reading and Participation

Much of our class time will be spent discussing papers, but I will also lecture on core themes. When we discuss specific papers we will use the following protocol:

- One student will be assigned to act as **discussion leader** for the paper. We will take turns leading discussion.
- All students will **arrive prepared** to contribute to a thorough and in-depth discussion of the assigned readings.

Presentations by discussion leaders should span approximately 15 minutes and address the following items. 1) What research question(s) is addressed and why is this question important? 2) What is the main theoretical approach (if not purely an empirical paper) and what are the important assumptions? 3) If the paper is empirical, what is the data set and empirical estimation strategy? 4) What are the key results? 5) What did you like best about the paper? 6) What was confusing or not convincing? 7) What follow up research questions does the article motivate? The group discussion will focus on (5), (6) and (7).

Problem Sets:

I will lecture from textbooks and related materials during some weeks and will assign problem sets based on the lecture material. The problem sets may require you to solve analytical models or perform numerical simulations. The problem set portion of your grade will be determined by the quality (and timeliness) of your answer sets.

Research Paper:

Each student will develop (or advance) an original research paper that is due on May 6. Ideally, student papers will relate to themes discussed in the class. I'll ask you to provide a one page document early in the semester that summarizes your research plan. Please make the plan available to all students, so that we can all give feedback. I'll also ask you to meet with me to provide a progress report later in the semester. During the last week of class students will present their research papers.

Course Learning Objectives:

Successful students will

- Learn to model the dynamic management of natural resources by rational economic actors;

- Apply appropriate methodologies to demonstrate the conditions under which benefits from resources are likely to be captured or dissipated by real world actors;
- Develop and hone presentation and discussion leadership skills; and
- Make progress on developing their own research agenda.

Guidelines for Doing Well in the Class:

- *Attend all classes*
- *Keep up with reading*
- *Devote necessary time* – the course meets two 75 minute periods per week and carries the expectation that students will work on learning activities (reading, writing, problem sets, studying, etc.) for about 3-4 hours out of classroom for every class period.

Accommodations for Students with Disabilities:

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform me of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. I will work either directly with you or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

Diversity and Inclusion:

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

TENTATIVE SCHEDULE (Subject to Change); *Can skim

Week	Topic	Readings	Notes
1 Jan. 25, 27	Syllabus, course organization Tragedy of the commons	<u>Wednesday</u> *Hardin 1968, Demsetz 1967, *Stavins 2011	Parker led discussion
2 Feb. 1, 3	Empirical applications Endogenous property rights: Are all commons tragedies?	<u>Monday</u> *Taylor 2011, Chen and Lan 2017, Smith 2016 <u>Wednesday</u> Kaffine 2009, Hill 2014, *Copeland and Taylor 2009	Student led discussion Student led discussion
3 Feb. 8, 10	Tragedy of the Anticommons Empirical application	<u>Monday</u> Heller 1998, Buchanan and Yoon 2000 <u>Wednesday</u> Leonard and Parker 2020	Student led discussion Parker led discussion
4 Feb. 15, 17	Brainstorm: further research on property rights Overview of fishery economics	<u>Monday</u> Parker 2018 <u>Wednesday</u> Conrad text, Ch. 3 Conrad and Clark, Ch. 2	Parker led discussion Parker led discussion
5 Feb. 22, 24	Overview of fishery economics Regulated open access & limited entry	<u>Monday</u> Conrad text, Ch. 3 Conrad and Clark, Ch. 2 <u>Wednesday</u> Homans and Wilen 1997; Deacon et. al. 2011	Parker led discussion Student led discussion
6 Mar. 1, 3	Catch-Shares Cooperation & Obstacles to Reform	<u>Monday</u> Hsueh 2017; Isaaksen and Richter 2019 <u>Wednesday</u> Deacon et al. 2013; Grainger and Parker 2013	Student led discussion Parker led discussion
7 Mar. 8, 10	Overview of forest economics Land use models	<u>Monday</u> Conrad, ch. 4 <u>Wednesday</u>	Parker led discussion

		<u>TBA</u>	
8 Mar. 15, 17	Deforestation determinants	<u>Monday</u> Blackman and Villalobos 2020; Abman and Lundberg 2019	Student led discussion
	Payments for Ecosystem Services	<u>Wednesday</u> Alix-Garcia and Wolff 2014; Robalino et al. 2017	Student led discussion
9 Mar. 22, 24	Conservation Easements	<u>Monday</u> TBA; Parker and Thurman 2018	Parker led discussion
	Brainstorm: further research on forest & land conservation	<u>Wednesday</u> TBD	Parker led discussion
10 Mar. 29, 31	Overview of non-renewable resource economics	<u>Monday</u> Conrad, ch. 5 Conrad and Clark, ch. 3	Parker led discussion
	Local extraction externalities	<u>Wednesday</u> Bartik et al. 2017; Boomhower 2019	Student led discussion
11 Apr. 5, 7	Resource curse	<u>Monday</u> Mehlum et al. 2006 van der Ploeg 2011	Student led discussion
	Local Resource curse	<u>Wednesday</u> Michaels 2011; *Parker and Jacobsen 2016	Student led discussion
12 Apr. 12, 14	Resources and conflict	<u>Monday</u> Berman et. al 2017	Parker led discussion
	Resources and conflict	<u>Wednesday</u> Parker and Vadheim 2017; Sanchez de al Sierra 2019	Student led discussion
13 Apr. 19, 21	Sanctions	<u>Monday</u> TBA	Student led discussion
	Responsible Sourcing	<u>Wednesday</u> TBA	Parker led discussion
14 Apr. 26, 28	Student research presentations		

AAE 760 READING LIST
Spring 2019

Natural Resource Scarcity, Trade, and Collapse

Abman, Ryan and Clark Lundberg. 2019. Does Free Trade Increase Deforestation? The Effects of Regional Trade Agreements. *Journal of the Association of Environmental and Resource Economists* 7(1): 35 – 72

Brander, James A. and M. Scott Taylor. 1998. The Simple Economics of Easter Island: A Ricardo-Malthus Model of Renewable Resource Use. *American Economic Review* 88(1): 119-138.

Borsky, Stefan and Paul A. Raschky. 2015. Intergovernmental Interaction in Compliance with an International Environmental Agreement. *Journal of the Association of Environmental and Resource Economists* 2(2): 161 – 203

Erhard, Tobia. 2018. Does International Trade Cause Overfishing? *Journal of the Association of Environmental and Resource Economists* 5(4): 695-711.

Gars, Johan and Daniel Spiro. 2017. Trade and the Risk of Renewable-Resource Collapse. *Journal of the Association of Environmental and Resource Economists* 5(1): 155-206.

Krautkraemer, Jeffrey A. 2005. Economics of Natural Resource Scarcity: The State of the Debate. *RFF Discussion Paper 05-14*

Krutilla, John V. 1967. Conservation Reconsidered. *American Economic Review* 57(4): 777-786.

Nordhaus, W.D. 1974. Resources as a Constraint on Economic Growth. *American Economic Review* 64(2): 22-26.

Tierney, John. 1990. Betting on the Planet. *New York Times Magazine*

Tragedy of the Commons and Anti-Commons

Baland, Jean-Marie and Jean-Philippe Platteau. 1996. Halting the Degradation of Natural Resources: Is there a Role for Rural Communities? *Food and Agriculture Organization of the United Nations*.

Banzhaf, H. Spencer, Timothy Fitzgerald, and Kurt Schnier. 2013. Nonregulatory Approaches to the Environment: Coasean and Pigouvian Perspectives. *Review of Environmental Economics and Policy* 7(2): 238 – 258.

Buchanan, James and Yong Soon. 2000. Symmetric Tragedies: Commons and Anticommons. *Journal of Law and Economics* 43(1): 1-13.

- Chen, Shuo and Xiaohuan Lan. 2017. There Will be Killing: Collectivization and Death of Draft Animals. *American Economic Journal: Applied Economics* 9(4): 58-77.
- Copeland, Brian R. and M. Scott Taylor. 2009. Trade, Tragedy, and the Commons. *American Economic Review* 99(3): 725-49.
- Demsetz, Harold. 1967. Toward at Theory of Property Rights. *American Economic Review* 67(2): 347-360.
- Dietz, Thomas, Elinor Ostrom and Paul Stern. 2003. The Struggle to Govern the Commons. *Science* 302 (5652): 1907-12.
- Fehr, Ernst, and Andreas Leibbrandt, 2010. A Field Study on Cooperativeness and Impatience in the Tragedy of the Commons". Unpublished manuscript: Department of Economics, University of Chicago.
- Fennell, Lee Anne. 2011. Commons, Anticommons, Semicommons. In *Research Handbook on the Economics of Property Law*, eds. Kenneth Ayotte and Henry E. Smith.
- Hardin, Garrett. 1968. The Tragedy of the Commons. *Science* 162: 1243-8.
- Heller, Michael A. 1998. The Tragedy of the Anticommons: Property in the Transition from Marx to Markets. *Harvard Law Review* 111: 621-688.
- Hill, Peter J. 2014. Are All Commons Tragedies? The Case of Bison in the 19th Century. *The Independent Review* 18(4): 1-18.
- Iwanowsky, Mathias. 2018. Property Rights, Resources, and Wealth: Evidence from a Land Reform in the United States, Working Paper.
- Kaffine, Daniel T. 2009. Quality and the Commons: The Surf Gangs of California. *Journal of Law and Economics* 52: 727- 743.
- Kosfeld, Michael, and Devesh Rustagi. 2015. Leader Punishment and Cooperation in Groups: Experimental Field Evidence from Commons Management in Ethiopia. *American Economic Review*, 105 (2): 747-83.
- Leibbrandt, Andreas, Uri Gneezy and John List, 2011. Ode to the sea; The socio-ecological Underpinnings of social norms. Unpublished manuscript: University of Chicago.
- Libecap, Gary D. 2014. Addressing Global Environmental Externalities: Transaction Costs Considerations. *Journal of Economic Literature* 52(2): 424-479.
- Leonard, Bryan, Dominic P. Parker, and Terry L. Anderson. 2020. Land Quality, Land Rights, and Indigenous Poverty. *Journal of Development Economics* (March)
- Leonard, Bryan and Dominic P. Parker. 2020. Fragmented Ownership and Natural Resource Use: Evidence from the Bakken. *The Economic Journal*

- Leonard, Bryan and Shawn Regan. Forthcoming. Legal and Institutional Barriers to Establishing Non-Use Rights to Natural Resources. *Natural Resource Journal*.
- McCarthy, N., E. Sadoulet, and A. de Janvry. 2001. Appropriation under Costly Cooperation. *Journal of Environmental Economics and Management* 42: 297-309.
- Ostrom, Elinor. 2008. Tragedy of the Commons. In *The New Palgrave Dictionary of Economics*, 2nd ed., ed. Steven Durlauf and Lawrence Blume. New York: Palgrave Macmillan.
- Parker, Dominic P. 2018. "Questions of Property Rights." Chapter 12 in *Research Agenda for New Institutional Economics*, eds. C. Ménard and M. Shirley. Edward Elgar, London.
- Smith, Henry E. 2002. Exclusion versus Governance: Two Strategies for Delineating Property Rights. *Journal of Legal Studies* 31: S453-S487.
- Smith, Steven M. 2016. Common Property Resources and New Entrants: Uncovering the Bias and Effects of New Users. *Journal of the Association of Environmental and Resource Economists* 3(1): 1-36.
- Stavins, Robert N. 2011. The Problem of the Commons: Still Unsettled after 100 Years. *American Economic Review* 101: 81-108.
- Taylor, Scott M. 2011. Buffalo Hunt: International Trade and the Virtual Extinction of the North American Bison. *American Economic Review* 101: 3162-3195.

Wildlife and Biodiversity

- Ando, Amy W. 1999. Waiting to be Protected under the Endangered Species Act: The Political Economy of Regulatory Delay. *Journal of Law and Economics* 42(1): 29-60.
- Brown, Gardner M. and Jason F. Shogren. 1998. Economics of the Endangered Species Act. *Journal of Economic Perspectives* 12(3): 3-20.
- Bulte, Erwin H., Richard D. Horan, and Jason F. Shogren. 2003. Elephants: Comment. *American Economic Review* 93(4): 1437-1445.
- Farah, Naima and John R. Boyce. 2015. Elephants and Mammoths: Can Ice Ivory Save Blood Ivory? Working Paper.
- Ferraro, P.J., C. McIntosh, and M. Ospina. 2007. The Effectiveness of the U.S. Endangered Species Act: An Econometric Analysis Using Matching Methods. *Journal of Environmental Economics and Management* 54: 245-261.
- Fischer, Carolyn, Edwin Muchapondwa, and Thomas Sterner. 2005. Bioeconomic Model of Community Incentives for Wildlife Management Before and After CAMPFIRE. *RFF Discussion Paper 05-06*.
- Fischer, Carolyn. 2010. Does Trade Help or Hinder the Conservation of Natural Resources? *Review of Environmental Economics and Policy* 4:1, 103-121.

- Sas-Rolfes, Michael 't and Timothy Fitzgerald. 2013. Can a Legal Horn Trade Save Rhinos? Working Paper.
- Kremer, Michael and Charles Morcom. 2000. Elephants. *American Economic Review* 90(1): 212-234.
- Kremer, Michael and Charles Morcom. 2003. Elephants: Reply. *American Economic Review* 93(4): 1446-1448.
- Langpap, Christian and Joe Kerkvliet. 2010. Allocating Conservation Resources under the Endangered Species Act. *American Journal of Agricultural Economics* 92(1): 110-124.
- Langpap, Christian and Junjie Wu. 2017. Thresholds, Perverse Incentives, and Preemptive Conservation of Endangered Species. *Journal of the Association of Environmental and Resource Economists* 4(S1): S227 – S259
- List, John A., Michael Margolis and Daniel E. Good. 2006. Is the Endangered Species Act Endangering Species? NBER Working Paper 12777.
- Lueck, Dean and Jeffrey A. Michael. 2003. Preemptive Habitat Destruction under the Endangered Species Act. *Journal of Law and Economics* 46(1): 27-60.
- Lueck, Dean. 1989. The Economic Nature of Wildlife Law. *Journal of Legal Studies* 18 (2): 291 - 324.
- Lueck, Dean. 2002. The Extermination and Conservation of the American Bison. *Journal of Legal Studies* (June): S609-S650.
- Raynor, Jennifer, Corbett Grainger, and Dominic P. Parker. 2021. Unintended Effects of Predator Removal: Wolves and Deer-Vehicle Collisions. Working Paper.
- Taylor, Scott M. 2011. Buffalo Hunt: International Trade and the Virtual Extinction of the North American Bison. *American Economic Review* 101: 3162-3195.
- Weitzman, Martin L. 1998. Noah's Ark Problem. *Econometrica* 66(6): 1279-1298.

Fisheries

- Costello, Christopher, Steven D. Gains and John Lynham. 2008. Can Catch Shares Prevent Fisheries Collapse? *Science* 321(19): 1678-1681.
- Costello, Christopher S. and Corbett Grainger. 2015. Property Rights, Regulatory Capture, and Exploitation of Natural Resources. NBER Working Paper No. 20859.
- Grainger, Corbett A. and Christopher Costello. 2014. Capitalizing Property Rights Insecurity in

- Natural Resource Assets. *Journal of Environmental Economics and Management* 67(2): 224-240.
- Deacon, Robert T., Dominic P. Parker, and Christopher Costello. 2013. Reforming Fisheries: Lessons from a Self-Selected Cooperative. *Journal of Law and Economics* 56(1): 83-125.
- Deacon, Robert T. and Dominic P. Parker. 2009. Encumbering Harvest Rights to Protect Marine Environments: A Model of Marine Conservation Easements. *Australian Journal of Agricultural and Resource Economics* 53: 37-58.
- Deacon, Robert T., David Finnoff and John Tschirhart. 2011. Restricted Capacity and Rent Dissipation in a Regulated Open Access Fishery. *Resource and Energy Economics* 33:366-380.
- Deacon, Robert T. and Dominic P. Parker. 2009. Encumbering Harvest Rights to Protect Marine Environments: A Model of Marine Conservation Easements. *Australian Journal of Agricultural and Resource Economics* 53: 37-58.
- Evans, Keith S. and Quinn Weninger. 2014. Information Sharing and Cooperative Search in Fisheries. *Environmental and Resource Economics* 58: 353-372.
- Gordon, H. Scott, 1954. The Economic Theory of a Common-Property Resource: The Fishery. *Journal of Political Economy* 62(2): 124-142.
- Grafton, R. Quentin, Dale Squires and Kevin J. Fox. 2000. Private Property and Economic Efficiency: A Study of a Common-Pool Resource. *Journal of Law and Economics* 43(2): 679-714.
- Grafton, R. 1996. Individual Transferable Quotas: Theory and Practice. *Reviews in Fish Biology and Fisheries* 6: 5-20.
- Grainger, Corbett and Dominic P. Parker. 2013. The Political Economy of Fishery Reform. *Annual Review of Resource Economics* 5: 369-386.
- Homans, F. R. and James E. Wilen. 1997. A Model of Regulated Open Access Resource Use. *Journal of Environmental Economics and Management* 32: 1-21.
- Hsueh, Lily. 2017. Quasi-Experimental Evidence on the “Rights to Fish”: The Effects of Catch Shares on Fishermen’s Days at Sea. *Journal of the Association of Environmental and Resource Economists* 4(4): 407 – 445
- Huang, Ling, and Martin D. Smith. 2014. The Dynamic Efficiency Costs of Common-Pool Resource Exploitation. *American Economic Review*, 104 (12): 4071-4103.
- Isaksen, Elisabeth Thuestad and Andries Richter. 2019. Tragedy, Property Rights, and the Commons: Investigating the Causal Relationship from Institutions to Ecosystem Collapse. *Journal of the Association of Environmental and Resource Economists* 6(4): 741 – 781

- Newell, Richard G., Kerry L. Papps, and James N. Sanchirico. 2007. Asset Pricing in Created Markets. *American Journal of Agricultural Economics* 89(2): 259-272.
- Newell, Richard G., Kerry L. Papps, and James N. Sanchirico. 2005. Fishing Quota Markets. *Journal of Environmental Economics and Management* 89(2): 259-272.
- Noack, Frederik, Marie-Catherine Riekhof, and Martin Quaas. 2017. Development in a Dual Economy: The Importance of Resource-Use Regulation. *Journal of the Association of Environmental and Resource Economists* 5(1): 233-263.
- Noussair, Charles N., Daan van Soest, and Jan Stoop. 2015. Cooperation in a Dynamic Fishing Game: A Framed Field Experiment. *American Economic Review*, 105 (5): 408-13.
- Scott, Anthony. 1955. The Fishery: The Objectives of Sole Ownership. *Journal of Political Economy* 63(2): 116-124.
- Squires, Dale and Niels Vestergaard. 2013. Technical Change and the Commons. *Review of Economics and Statistics* 95(5): 1769-1787.
- Smith, Martin D. 2012. The New Fisheries Economics: Incentives Across Many Margins. *Annual Review of Resources Economics* 379-402.
- Smith, Martin D., and James E. Wilen. 2003. Economic Impacts of Marine Reserves: Importance of Spatial Behavior. *Journal of Environmental Economics and Management* 46(2): 183-206.
- McWhinnie, Stephanie F. 2009. The Tragedy of the Commons in International Fisheries: An Empirical Examination. *Journal of Environmental Economics and Management* 57: 321-333.

Forest Resources

- Alesina, Alberto; Cateroma Gennaioli; and Stefania Lovo. 2017. Public Goods and Ethnic Diversity: Evidence from Deforestation in Indonesia. NBER Working Paper 20504.
- Alix-Garcia, Craig McIntosh, Katharine R. E. Sims and Jarrod R. Welch. 2013. The Ecological Impact of Poverty Alleviation: Evidence from Mexico's Oportunidades Program. *Review of Economics and Statistics* 95(2): 417-435.
- Alix-Garcia, Jennifer M., Katharine R.E. Sims and Patricia Yanez-Pagans. 2015 Only One Tree from Each Seed? Environmental Effectiveness and Poverty Alleviation in Programs of Payments for Ecosystem Services. *American Economic Journal: Economic Policy* 7(4): 1-40.
- Alix-Garcia, Jennifer and Hendrik Wolff. 2014. Payments for Ecosystem Services from Forests. *Annual Review of Resource Economics*
- Alston, Lee J., Krister Andersson and Steven M. Smith. 2013. Payment for Environmental Services: Hypotheses and Evidence. *Annual Review of Resource Economics*: 139-159.

- Amacher, Gregory S., Markku Ollikainen, and Erkki Koskela. 2009. *Economics of Forest Resources*. MIT Press. Cambridge MA.
- Arriagada, Rodrigo A., Paul J. Ferraro, Erin O. Sills, Subhrendu K. Pattanayak, and Silvia Cordero-Sancho. 2012. Do Payments for Environmental Services Affect Forest Cover? A Farm-Level Evaluation from Costa Rica. *Land Economics* 88(2): 382-399.
- Blackman, Allen and Laura Villalobos. 2020. Use Forests or Lose Them? Regulated Timber Extraction and Tree Cover Loss in Mexico. *Journal of the Association of Environmental and Resource Economists* 8(1): 125 – 163
- Bohn, Henning and Robert T. Deacon. 2000. Ownership Risk, Investment, and the Use of Natural Resources. *American Economic Review* 90(3): 526-549.
- Bulte, E. H., R. Damania and R. Lopez. 2007. On the Gains of Committing to Inefficiency: Corruption, Deforestation and Low Land Productivity in Latin America. *Journal of Environmental Economics and Management*
- Burgess, Robin, Matthew Hansen, Benjamin A. Olken, Peter Potapov and Stefanie Sieber. 2012. The Political Economy of Deforestation in the Tropics. *Quarterly Journal of Economics* 1707-1754.
- Chimeli, Ariaster B. and Rodrigo R. Soares. 2017. The Use of Violence in Illegal Markets: Evidence from Mahogany Trade in the Brazilian Amazon. *American Economic Journal: Applied Economics* 9(4): 30-57.
- Fenichel, Eli P., Wiktor Adamowicz, Mark S. Ashton, and Jefferson S. Hall. 2019. Incentive Systems for Forest-Based Ecosystem Services with Missing Financial Service Markets. *Journal of the Association of Environmental and Resource Economists* 6(2): 319 – 347
- Foster, Andrew D., and Mark R. Rosenzweig. 2003. Economic Growth and the Rise of Forests. *Quarterly Journal of Economics* 118(2): 601-37.
- Jayachandran, Seema. 2013. Liquidity Constraints and Deforestation: The Limitations of Payments for Ecosystem Services. *American Economic Review P&P* 103(3): 309-313.
- Plantinga, Andrew and Klaas van't Veld. 2005. Carbon Sequestration or Abatement? The Effect of Rising Carbon Prices on the Optimal Portfolio of Greenhouse-Gas Mitigation Strategies. *Journal of Environmental Economics and Management* 50: 59-81.
- Robalino, Juan, Alexander Pfaff, and Laura Villalobos. 2017. Heterogeneous Local Spillovers from Protected Areas in Costa Rica. *Journal of the Association of Environmental and Resource Economists* 4(3): 795 – 820
- Sohngen, Brent and Robert Mendelsohn. 1998. Valuing the Impact of Large-Scale Ecological Change

in a Market: The Effect of Climate Change on U.S. Timber. *American Economic Review* 88(4): 686-710.

Non-Renewable Resources – Minerals and Oil

Anderson, Soren T., Ryan Kellogg, and Stephen Salant. 2018. Hotelling under Pressure. *Journal of Political Economy* 126(3): 984-1026

Black, Geoffrey and Jeffrey T. LaFrance. 1998. Is Hotelling's Rule Relevant to Domestic Oil Production? *Journal of Environmental Economics and Management* 36: 149-169.

Bohn, Henning and Robert T. Deacon. 2000. Ownership Risk, Investment, and the Use of Natural Resources. *American Economic Review* 90(3): 526-549.

Boomhower, Judson. 2020. Drilling Like There's no Tomorrow: Bankruptcy, Insurance, and Environmental Risk. *American Economic Review*.

Boslett, Andrew, Todd Guilfoos, and Corey Lang. 2019. Valuation of the External Costs of Unconventional Oil and Gas Development: The Critical Importance of Mineral Rights Ownership. *Journal of the Association of Environmental and Resource Economists* 6(3): 531 – 561

Boyce, John R. 2012. Prediction and Inference in the Hubbert-Deffeyes Peak Oil Model. *The Energy Journal*. 34(2): 91-141.

Brown, Jason P, Timothy Fitzgerald and Jeremy G. Weber. 2019. Does Resource Ownership Matter? Oil and Gas Royalties and the Income Effect of Extraction. *Journal of the Association of Environmental and Resource Economists* 6(6): 1039-1064.

Fattouh, Bassam and Lavan Mahadeva. 2013. OPEC: What Difference Has it Made? *Annual Review of Resource Economics* 5: 427-443.

Griffin, James M. and Weiwen Xiong. 1997. The Incentive to Cheat: An Empirical Analysis of OPEC. *Journal of Law and Economics* (October): 289-316.

Harsted, Bard. 2012. Buy Coal! A Case for Supply-Side Environmental Policy. *Journal of Political Economy* 120(1): 77-115.

Hausman, Catherine and Lucija Muehlenbachs. 2018. Price Regulation and Environmental Externalities: Evidence from Methane Leaks. *Journal of the Association of Environmental and Resource Economists* 6(1): 173 – 109

Kellogg, Ryan. 2014. The Effect of Uncertainty on Investment: Evidence from Texas Oil Drilling. *American Economic Review* 104(6): 1698-1734.

- Libecap, Gary D. and Steven N. Wiggins. 1984. Contractual Responses to the Common Pool: Prorating of Crude Oil Production. *American Economic Review* 74(1): 87-98.
- Muehlenbachs, Lucija, Elisheba Spiller and Christopher Timmins. 2015. The Housing Market Impacts of Shale Gas Development. *American Economic Review* 105(12): 3633-59.
- Stroebel, Johannes and Arthur van Benthem. 2013. Resource Extraction Contracts under Threat of Expropriation: Theory and Evidence. *Review of Economics and Statistics* 95(5): 1622-1639.
- Victor, David G. 2013. National Oil Companies and the Future of the Oil Industry. *Annual Review of Resource Economics* 5: 445-462
- Wiggins, Steven and Gary D. Libecap. 1985. Oil Field Unitization: Contractual Failure in the Presence of Imperfect Information. *American Economic Review* 75: 368-85.

The Natural Resource Curse

- Allcott, Hunt and Daniel Keniston. 2014. Dutch Disease or Agglomeration? The Local Economic Effects of Natural Resource Booms in Modern America. Working Paper.
- Aragón, F.M. and Rud, J.P. 2013. Natural Resources and Local Communities: Evidence from a Peruvian Gold Mine. *American Economic Journal: Economic Policy* 5(2): 1-25.
- Armand, Alex, Alexander Coutts, Pedro C. Vicente, and Inês Vilela. 2020. Can Information Break the Political Resource Curse? Experimental Evidence from Mozambique. *American Economic Review* 110(11): 3431-3453.
- Berman, Nicolas, Mathieu Couttenier, Dominic Rohner, and Mathias Thoenig. 2017. This Mine is Mine! How Minerals Fuel Conflicts in Africa. *American Economic Review* 107(6): 1564-1610.
- Boyce, John R. and J.C. Herbert Emory. 2011. Is a Negative Correlation between Resource Abundance and Growth Sufficient Evidence that there is a 'Resource Curse.' *Resource Policy* 36: 1-13.
- Brollo, Fernanda, Tommaso Nannicini, Roberto Perotti, and Guido Tebellini. 2013. *The Political Resource Curse*. *American Economic Review* 103(5): 1759-1796.
- Caselli, F. and Michaels, G. (2013). "Do Oil Windfalls Improve Living Standards? Evidence from Brazil", *American Economic Journal: Applied Economics* (5)1: 208-238.
- Collier, P. and Goderis, B. 2008. Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum. Munich Personal RePEc Archive, MPRA Working Paper No. 17315.

- Cust, James, Torfinn Harding, and Pierre-Louis Vezina. 2019. Dutch Disease Resistance: Evidence from Indonesia Firms. *Journal of the Association of Environmental and Resource Economists* 6(6): 1205-1237.
- Deacon, Robert. T. 2011. The Political Economy of the Natural Resource Curse: A Survey of Theory and Evidence, *Foundations and Trends in Microeconomics*, vol. 7(2): pp. 111-208.
- Mehlum, H., Moene, K., and Torvik. R. 2006. Institutions and the Resource Curse. *The Economic Journal* 116(508): 1-20.
- Michaels, Guy. 2011. The Long Term Consequences of Resource-Based Specialization. *The Economic Journal* 121(551): 31-57.
- Jung, Suhyun, Chuan Liao, Arun Agrawal and Daniel G. Brown. 2019. Evidence on Wealth-Improving Effects of Forest Concessions in Liberia. *Journal of the Association of Environmental and Resource Economists* 6(5): 961-1000.
- Parker, Dominic P. and Bryan Vadheim. 2017. Resource Cursed or Policy Cursed? US Regulation of Conflict Minerals and Violence in the Congo. *Journal of the Association of Environmental and Resource Economists* (4)1: 1-49.
- Sachs, J.D., and Warner, A.M. (1995). "Natural Resource Abundance and Economic Growth", National Bureau of Economic Research, NBER Working Paper No. 5398.
- van der Ploeg, F. 2011. Natural Resources: Curse or Blessing? *Journal of Economic Literature* 49(2): 366-420.

Land and Water Use

- Alston, Lee J., Gary D. Libecap, and Bernardo Mueller. 2000. Land Reform Policies, The Sources of Violent Conflict and Implications for Deforestation in the Brazilian Frontier. *Journal of Environmental Economics and Management*
- Blakeslee, David, Ram Fishman, and Veena Srinivasan. 2020. Way Down in the Hole: Adaptation to Long-Term Water Loss in Rural India. *American Economic Review*, 110 (1): 200-224.
- Brewer, Jedidiah, Robert Glennon, Alan Ker and Gary D. Libecap. 2007. Water Markets in the West: Prices, Trading, and Contractual Forms. NBER Working Paper 13002.
- Burchi-eld, Marcy, Henry G. Overman, Diego Puga, and Matthew A. Turner. 2006. Cause of Sprawl: A Portrait from Space. *Quarterly Journal of Economics* (May): 587-633 - See more at:
- Coman, Katharine. 2011. Some Unsettled Problems of Irrigation. 1911. *American Economic Review*, 101 (1): 36-48.
- Debaere, Peter and Amanda Kurzendoerfer. 2017. Decomposing US Water Withdrawal since 1950. *Journal of the Association of Environmental and Resource Economists* 4(1): 155-196.

- Fishman, Ram, Upmanu Lall, Vijay Modi, and Nikunj Parekh. 2016. Can Electricity Pricing Save India's Groundwater? Field Evidence from a Novel Policy Mechanism in Gujarat. *Journal of the Association of Environmental and Resource Economists* 3(4): 819 – 855
- Hornbeck, Richard. 2012. The Enduring Impact of the American Dust Bowl: Short and Long-Run Adjustments to Environmental Catastrophe. *American Economic Review* 102(4): 1477-1507.
- Hornbeck, Richard and Pinar Keskin. Forthcoming. The Historically Evolving Impact of the Ogallala Aquifer: Agricultural Adaptation to Groundwater and Drought. *American Economic Journal: Applied Economics*.
- Kremer, Michael, Jessica Leino, Edward Miguel, and Alix Peterson Zwane. 2011 "Spring Cleaning: Rural Water Impacts, Valuation, and Property Rights Institutions." *Quarterly Journal of Economics* 126 (1): 145–205
- Kanazawa, Mark. 2003. Origins of Common Law Restrictions on Water Transfers: Groundwater in Nineteenth-Century California. *Journal of Legal Studies* 32(1): 153-80. - See more at: <http://perc.org/articles/trade-or-not-trade#sthash.recUMnaJ.dpuf>
- Libecap, Gary D. 2008. Chinatown Revisited: Owens Valley and Los Angeles-Bargaining Costs and Fairness Perception of the First Major Water Rights Exchange. *Journal of Law, Economics, and Organization* 24(2): 1-28
- Libecap, Gary D. and Dean Lueck. 2011. The Demarcation of Land and the Role of Coordinating Property institutions. *Journal of Political Economy* 119(3): 426-427.
- Parker, Dominic P. and Walter N. Thurman. 2018. Tax Incentives and the Price of Conservation. *Journal of the Association of Environmental and Resource Economists*
- Pfeiffer, Lisa and C.-Y. Cynthia Lin. 2012. Groundwater Pumping and Spatial Externalities in Agriculture. *Journal of Environmental Economics and Management* 64(1): 16-30.
- Provencher, Bill and Oscar Burt. 1993. The Externalities Associated with the Common Property Exploitation of Groundwater. *Journal of Environmental Economics and Management* 24(2): 139-158.
- Schlenker, Wolfram, W. Michael Hanemann, and Anthony C. Fisher. 2006. The Impact of Global Warming on U.S. Agriculture: An Econometric Analysis of Optimal Growing Conditions. *Review of Economics and Statistics* 88(1): 113 – 125.
- Smith, Steven M., Krister Andersson, Kelsey C. Cody, Michael Cox, and Darren Ficklin. 2017. Responding to a Groundwater Crisis: The Effects of Self-Imposed Economic Incentives. *Journal of the Association of Environmental and Resource Economists* 4(4): 985 – 1023
- Turner, Matthew A., Andrew Haughwout, and Wilbert van der Klaauw. 201x. Land Use Regulation and Welfare. *Econometrica*

Vercammen, James. 2018. A Welfare Analysis of Conservation Easement Tax Credits. *Journal of the Association of Environmental and Resource Economists* 6(1): 43 – 71

Scope of Regulation and Federalism

Banzhaf, Spencer H. and B. Andrew Chupp. 2012. Fiscal Federalism and Interjurisdictional Externalities: New Results and an Application to US Air Pollution. *Journal of Public Economics* 96: 449-464.

Burgess, Robin; Matthew Hansen; Benjamin A. Olken; Peter Potapov; and Stefanie Sieber. 2012. The Political Economy of Deforestation in the Tropics. *Quarterly Journal of Economics* 127: 1707-1754.

Lipscomb, Molly and Ahmed Mushfiq Mobarak. 2017. Decentralization and Pollution Spillovers: Evidence from the Re-drawing of County Borders in Brazil. *Review of Economic Studies* 84: 464-502.

Oates, Wallace E. 2001. A Reconsideration of Environmental Federalism. *Resources for the Future Discussion Paper 01-54*.

Olmstead, Sheila M. and Hilary Sigman. 2015. Damming the Commons: An Empirical Analysis of International Cooperation and Conflict in Dam Location. *Journal of the Association of Environmental and Resource Economists* (2)4: 497 – 526

Tullock, Gordon. 1969. Problems of Scale. *Public Choice* 6: 19-29.