

Matthew G. Burgess

Assistant Professor
Cooperative Institute for Research in Environmental Sciences
Environmental Studies Program
Department of Economics
University of Colorado, Boulder, CO 80309

Email: matthew.g.burgess@colorado.edu
Phone: 303-492-0594
Office: Ekeley S331
www.mattgburgess.ca
@matthewgburgess

Born July 2, 1987, in Montreal, Canada. Canadian citizen, U.S. permanent resident.

Education

Ph.D. 2014, University of Minnesota, Ecology, Evolution and Behavior

Advised by Dr. David Tilman and Dr. Stephen Polasky

Graduate coursework in economics and mathematics including: Microeconomics (Consumer Choice, Production and Uncertainty, Social Choice and Welfare), Econometric Analysis, Dynamic Optimization, Game Theory, Mathematical Analysis of Biological Networks

Honours B.Sc. 2009, University of Toronto, Ecology Specialist

Advised by Dr. Peter A. Abrams

Appointments

2021-2022: Faculty Fellow, Bruce D. Benson Center for the Study of Western Civilization, University of Colorado Boulder

2021-2022: Affiliate Faculty, Tropical Conservation Biology and Environmental Sciences Department, University of Hawai'i Hilo

Since 2018: Assistant Professor, Cooperative Institute for Research in Environmental Sciences, Environmental Studies Program, Department of Economics (courtesy appointment), University of Colorado Boulder
Parental leave Fall 2019

2014-2018: Postdoctoral Scholar, Sustainable Fisheries Group, University of California, Santa Barbara
Advised by Dr. Steven D. Gaines and Dr. Christopher Costello

Publications (†denotes advisee)

Submitted/Working papers (drafts available on request)

5. **Burgess MG**, Becker SL[†], Fredston A, Brooks CM. Perspectives on most plausible climate futures, and recommendations for using scenarios in fisheries and aquatic conservation research (**in revision**).
4. Marshall R[†], **Burgess MG**. Advancing bipartisan decarbonization policies: Lessons from state-level successes and failures. **Preprint: SSRN 3903644 (revision under review at *Climatic Change*)**.
3. **Burgess MG**. Five simple mathematical insights about fairness. (**revision requested at *The Journal of Mathematical Sociology***).
2. Hegwood M[†], Langendorf RE[†], **Burgess MG**. Why win-wins are rare in complex environmental management. **Preprint: SocArXiv cfp43 (revision under review at *Nature Sustainability*)**.
1. **Burgess MG**, Langendorf RE[†], Ippolito T, Pielke Jr. R. Optimistically biased economic growth forecasts and negatively skewed annual variation. **Preprint: SocArXiv vndqr (in revision)**.

Published papers

25. Pielke Jr R, **Burgess MG**, Ritchie J. (**in press**) Plausible 2005-2050 emissions scenarios project between 2 and 3 degrees C of warming by 2100. ***Environmental Research Letters***.
Press coverage by Reason.
24. **Burgess MG**, Carrico A, Gaines SD, Peri A, Vanderheiden S. (2021) Prepare developed democracies for long-run economic slowdowns. ***Nature Human Behaviour***, 5, 1608-1621.
Press coverage by Futurity, Eurasia Review, CU Boulder Today, and others.

23. Millage KD, Villaseñor-Derbez JC, Bradley D, **Burgess MG**, Lenihan HS, Costello C. (2021) Self-financed marine protected areas. *Environmental Research Letters* 16, 125001.
Press coverage by Science.
22. Langendorf RE[†], **Burgess MG**. (2021) Empirically classifying network mechanisms. *Scientific Reports* 11, 20501.
21. **Burgess MG***, Ritchie J*, Shapland J[†], Pielke Jr. R. (2021) IPCC baseline scenarios have over-projected CO₂ emissions and economic growth. *Environmental Research Letters* 16, 014016. *Equal contribution
Press coverage by Wall St. Journal, Forbes, and others.
20. Rao A, **Burgess MG**, Kaffine D. (2020) Orbital-use fees could more than quadruple the value of the space industry. *Proceedings of the National Academy of Sciences* 117, 12756-12762.
Press coverage by CBS, NBC, ABC, Daily Mail, Japan Today, and others.
19. **Burgess MG**, Carrella E, Drexler M, Axtell RL, Bailey RM, Watson JR, Cabral R, Clemence M, Costello C, Dorsett C, Gaines SD, Klein ES, Koralus P, Leonard G, Levin SA, Little LR, Lynham J, Madsen JK, Merkl A, Owashi B, Saul SE, van Putten IE, Wilcox S. (2020) Opportunities for agent-based modeling in human dimensions of fisheries. *Fish and Fisheries* 21, 570-587.
18. **Burgess MG**, Plank MJ. (2020) What unmanaged fishing patterns reveal about optimal management: applied to the balanced harvesting debate. *ICES Journal of Marine Science* 77, 901-910.
17. Carrella E, Saul S, Marshall K, **Burgess MG**, Drexler M, Cabral RB, Bailey R, Madsen JK, Dorsett C. (2020) Simple adaptive rules describe fishing behaviour better than perfect rationality in the U.S. west coast groundfish fishery. *Ecological Economics* 169, 106449.
16. **Burgess MG**, Fredston-Hermann A, Tilman D, Loreau M, Gaines SD. (2019) Broadly inflicted stressors can cause ecosystem thinning. *Theoretical Ecology* 12, 207-223.
15. Bailey RM, Carrella E, Axtell R, **Burgess MG**, Cabral RB, Drexler M, Dorsett C, Madsen JK, Merkl A, Saul S. (2019) A computational approach to managing coupled human-environmental systems: The POSEIDON model of ocean fisheries. *Sustainability Science* 14, 259-275.
14. Tallis HM, Hawthorne PL, Polasky S, Reid J, Beck MW, Brauman K, Bielicki JM, Binder S, **Burgess MG**, Cassidy E, Clark A, Fargione J, Game ET, Gerber J, Isbell F, Kiesecker J, McDonald R, Metian M, Molnar JL, Mueller ND, O'Connell CO, Ovando D, Troell M, Boucher T, McPeck B. (2018) An attainable global vision for conservation and human well-being. *Frontiers in Ecology and the Environment* 16, 563-570.
Press coverage by Davos World Economic Forum, and others.

August 2018: Started at the University of Colorado Boulder

13. **Burgess MG**, Gaines SD. (2018) The scale of life and its lessons for humanity. *Proceedings of the National Academy of Sciences* 115, 6328-6330.
12. **Burgess MG***, McDermott GR*, Owashi B, Peavey Reeves LE, Clavelle T, Ovando D, Wallace BP, Lewison RL, Gaines SD, Costello C. (2018) Protecting marine mammals, turtles, and birds by rebuilding global fisheries. *Science* 359, 1255-1258. *Equal contribution
Faculty of 1000 recommended. Press coverage by Scientific American, ScienceDaily, Greenwire, and others.
11. **Burgess MG**, Clemence M, McDermott GR, Costello C, Gaines SD. (2018) Five rules for pragmatic blue growth. *Marine Policy* 87, 331-339.
10. **Burgess MG**, Costello C, Fredston-Hermann A, Pinsky ML, Gaines SD, Tilman D, Polasky S. (2017) Range contraction enables harvesting to extinction. *Proceedings of the National Academy of Sciences* 114, 3945-3950.
Cover article for the issue. Press coverage by Futurity, ScienceDaily, and others.
9. **Burgess MG**, Giacomini HC, Szuwalski CS, Costello C, Gaines SD. (2017) Describing ecosystem contexts with single-species models: A theoretical synthesis for fisheries. *Fish and Fisheries* 18, 264-284.
8. Jacobsen NS, **Burgess MG**, Andersen KH. (2017) Efficiency of fisheries is increasing at the ecosystem level. *Fish and Fisheries* 18, 199-211.
7. Szuwalski CS, **Burgess MG**, Costello C, Gaines SD. (2017) High fishery catches through trophic cascades in China. *Proceedings of the National Academy of Sciences* 114, 717-721.
Highlighted on front cover and by commentary in the issue. Press coverage by Hakai Magazine, ScienceDaily, and others

6. Williams R*, **Burgess MG***, Ashe E, Gaines SD, Reeves RR. (2016) U.S. seafood import restriction presents opportunity and risk. *Science* 354, 1372-1374. *Equal contribution
Press coverage by National Geographic, NPR, Huffington Post, Quartz, The Conversation, and others.
5. **Burgess MG**, Diekert FK, Jacobsen NS, Andersen KH, Gaines SD. (2016) Remaining questions in the case for balanced harvesting. *Fish and Fisheries* 17, 1216-1226.
Press coverage by National Geographic, Davos World Economic Forum, and others.
4. **Burgess MG**, McDermott GR. (2015) Resolving disputes over ocean calamities. *BioScience* 65, 1115-1116.
3. **Burgess MG**. (2015) Consequences of fleet diversification in managed and unmanaged fisheries. *Canadian Journal of Fisheries and Aquatic Sciences* 72, 54-70. *Press coverage by CBC and others.*
2. **Burgess MG**, Polasky S, Tilman D. (2013) Predicting overfishing and extinction threats in multispecies fisheries. *Proceedings of the National Academy of Sciences* 110, 15943-15948.
Highlighted on front cover and by commentary in the issue. Press coverage by CBC, Science for Environment Policy (European Commission), ClimateWire, and others.
1. **Burgess MG**. (2009) Sub-optimal pit construction in predatory ant lion larvae. *Journal of Theoretical Biology* 260, 379-385.

Technical reports (available on request; †denotes advisee)

4. **Burgess MG**, Millage K†, Ovando D, Thomas L, Rubino LL, Costello C. (2018) Transferable effort vs. transferable catch in age-structured fisheries. *Report to the Nature Conservancy*, September 12, 2018.
3. Millage K†, **Burgess MG**, Strauss K, Lenihan HS, Costello C. (2017) Ocean Halos: A conceptual model of marine zoning in French Polynesia. *Report to The Nature Conservancy*, October 10, 2017.
2. Millage K†, Tsukayama L†, Owashi B, Clemence M, **Burgess MG**, Gaines SD. (2016) Transfer effects following decline in the United States pelagic longline fleet. *Report to the Environmental Defense Fund*, December 24, 2016.
1. **Burgess MG**, Gaines SD. (2016) Relative impacts of fishing on bycatch and target species drive long-term threats and tradeoffs. *Report to the Environmental Defense Fund*, October 7, 2016.

Letters

1. **Burgess MG**, Fredston-Hermann A, Pinsky ML, Gaines SD, Tilman D. (2017) Reply to Le Pape et al.: Management is key to preventing marine extinctions. *Proceedings of the National Academy of Sciences* 114, E6275-E6276.

Grants

- “Future land-use strategies and their consequences for people and nature: FUTURELANDS”, European Research Council (Collaborator; \$32,524 to University of Colorado)
- “How does bundling climate policies with economic and social policies affect voter support?”, CIRES Innovative Research Program, University of Colorado Boulder (2021-2022) (\$24,500) (PI)
- “Disruptive technologies and US food security: interdisciplinary training of graduate Fellows to be food system leaders”, United States Department of Agriculture National Institute of Food and Agriculture National Needs Graduate and Postgraduate Fellowship Grants Program (2019-2024) (\$262,500) (Co-PI)
- “Transfer effects in the Atlantic and Gulf of Mexico pelagic longline fishery”, Environmental Defense Fund (2016) (\$66,000)*
- “Reimagining fisheries management”, Ocean Conservancy (2015-2016) (\$258,750)*
- University of Minnesota EEB Research Award (2014) (\$1,980)

*I was too junior at the time of the award to be an official PI but led the development of the proposal and the supervision of the grant.

Awards

- Open Inquiry Award for Teaching, Heterodox Academy (2020)
- Honorable Mention for the University of Minnesota Best Dissertation Award (2015)
- University of Minnesota Doctoral Dissertation Fellowship (2013-2014)

- University of Minnesota College of Biological Sciences Award for Outstanding Performance as a Teaching Assistant (2011)
- NSF Woods Hole Travel Award (2011)
- Best Student Presentation—World Conference on Natural Resource Modeling (2011)
- NSERC Postgraduate Scholarship (2010-2013)

Teaching (*denotes a course I designed and developed)

- *Economic Growth Futures, Climate Change, and Society (ENVS 4840, Spring 2021, Fall 2021), University of Colorado Boulder
- *Sustainable Economies (ENVS 3555, Spring 2021; ENVS 4100 in Spring 2019, 2020), University of Colorado Boulder
 - Mentioned in citation for Open Inquiry Award for Teaching, Heterodox Academy (2020)
- *Mathematics of Human-Environment Systems (ENVS 4100/5100, Fall 2020), University of Colorado Boulder
- Natural Resource Economics (ECON 3535, Fall 2018, 2020, 2021), University of Colorado Boulder
- *Introduction to Human Dimensions of Environmental Studies (ENVS 1001, Fall 2021), University of Colorado Boulder
- Introduction to Developing Environmental Solutions (ENVS 1001, Spring 2020), University of Colorado Boulder

Advising

Postdoctoral scholars (primary advisor)

- Ryan Langendorf (2019-present, primary advisor), University of Colorado Boulder

Graduate students (primary advisor)

- Ashley Dancer (2021-present, primary advisor, Environmental Studies Ph.D.), University of Colorado Boulder
- Sarah Becker (2021-present, co-advisor, Environmental Studies Ph.D.), University of Colorado Boulder
- Hilary Brumberg (2021-present, co-advisor, Environmental Studies Ph.D.), University of Colorado Boulder
- Margaret Hegwood (2020-present, co-advisor, Environmental Studies Ph.D.), University of Colorado Boulder

Undergraduate students (primary advisor)

- Mohamed Elbedawi (2021-2022, primary advisor, Environmental Studies Honors thesis), University of Colorado Boulder
- Peyton Korte (2021-2022, primary advisor, Environmental Studies Honors thesis and Undergraduate Research Opportunities Program), University of Colorado Boulder
- Grace Kroeger (2021-2022, primary advisor, Environmental Studies Honors thesis and Undergraduate Research Opportunities Program), University of Colorado Boulder
- Justin Lawson (2021-2022, primary advisor, Economics Honors thesis and Undergraduate Research Opportunities Program), University of Colorado Boulder
- Renae Marshall (2020-2021, primary advisor, Environmental Studies Honors thesis and Undergraduate Research Opportunities Program), University of Colorado Boulder
 - *Ms. Marshall won the 2021 Arts & Sciences Outstanding Graduate award—the college's top award for Honors students.*
- Naya O'Reilly (2019-2020, primary advisor, Environmental Studies Honors thesis and Undergraduate Research Opportunities Program), University of Colorado Boulder
- Joshua Hartmann (2019-2020, primary advisor, Environmental Studies Honors thesis), University of Colorado Boulder
- John Shapland (2019-2020, primary advisor, Environmental Studies Honors thesis), University of Colorado Boulder

- Vincent Wroble (2019, primary advisor, CIRES summer Research Assistant), University of Colorado Boulder

Other advising

- Naya O'Reilly (2021-present, committee member, Tropical Conservation Biology and Environmental Sciences M.S.), University of Hawai'i Hilo
- Waverly Eichhorst (2020-present, committee member, Environmental Studies Ph.D.), University of Colorado Boulder
- Tara Ippolito (2019-2021, committee member, Environmental Studies Ph.D.), University of Colorado Boulder
- Luca Palasti (2021, committee member, Geography M.S.), University of Colorado Boulder
- Roy Rutherford (2021, committee member, Ecology and Evolutionary Biology Honors thesis), University of Colorado Boulder
- Joanna Kristensen (2021, committee member, Economics Honors thesis), University of Colorado Boulder
- Cameron Duff (2020, committee member, Economics Ph.D.), University of Colorado Boulder
- Matthew Butner (2019, committee member, Economics Ph.D.), University of Colorado Boulder
- Akhil Rao (2018-2019, committee member, Economics Ph.D.), University of Colorado Boulder
- Zephyr Sylvester (2018, guidance committee member, Environmental Studies M.S.), University of Colorado Boulder
- Cale Wagner (2018-2019, committee member, Environmental Design Honors thesis), University of Colorado Boulder
- Jacob Schmidt (2018, committee member, Economics Honors thesis), University of Colorado Boulder
- Katherine Millage (2016-2018, advisor, as summer intern and Project Researcher), University of California, Santa Barbara
- Lily Tsukayama (2016, advisor, summer internship), University of California, Santa Barbara
- Jessica Braun (2013-2014, advisor, through HHMI Undergraduate Research Mentor Program and subsequent internship), University of Minnesota
- Aaron Cohen (2013, co-advisor with David Tilman, Ecology, Evolution, and Behavior Honors thesis), University of Minnesota

Invited Presentations

- Heterodox Academy Graduate Affiliate Conversation (December 2021)
- Climate change, democracy, and society workshop, University of Colorado Boulder (2021)
- 2021 Florida Climate Forecast Conference, Climate Adaptation Center & University of South Florida Sarasota-Manatee (2021)
- Energy and Environment Forum, Howard H. Baker Jr. Center for Public Policy, University of Tennessee Knoxville (2021)
- Greer Seminar Series, Haslam College of Business, University of Tennessee Knoxville (2021)
- Bruce D. Benson Center for the Study of Western Civilization, University of Colorado Boulder (2021)
- Heterodox Academy Graduate Affiliate Conversation (February 2021)
- Heterodox Academy Member Spotlight (2021)
- NOAA Space Weather Prediction Center (2020)
- Department of Ecology and Evolutionary Biology, University of Colorado Boulder (2019)
- Environmental Studies Program, University of Colorado Boulder (2019)
- Institute for Oceans and Fisheries, University of British Columbia, Vancouver, Canada (2018)
- Environmental Sustainability Research Centre, Brock University, St. Catharines, Canada (2018)
- Mathematical Biology group, Department of Mathematics and Statistics, McMaster University, Hamilton, Canada (2018)
- Department of Biology, McMaster University, Hamilton, Canada (2018)
- Interdepartmental Graduate Program in Marine Science, University of California, Santa Barbara, CA (2018)

- Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO (2018)
- Department of Earth System Science, University of California, Irvine, CA (2018)
- Leibniz-Institute for Freshwater Ecology and Inland Fisheries, Berlin, Germany (2018)
- Departments of Ecology, Evolution and Natural Resources, and Marine and Coastal Sciences, Rutgers University, New Brunswick, NJ (2017)
- Department of Geography, Planning and Environment, Concordia University, Montreal, Canada (2016)
- School of Aquatic and Fishery Sciences, University of Washington, Seattle (2016)
- Department of Natural Resource Sciences, McGill University, Montreal, Canada (2016)
- National Institute of Aquatic Resources (DTU Aqua), Technical University of Denmark, Charlottenlund, Denmark (2015)
- Centre for Ecological and Evolutionary Synthesis (CEES), University of Oslo, Oslo, Norway (2015)
- School of Geography and the Environment, University of Oxford, Oxford, UK (2015)
- OneNOAA Science Seminar, National Oceanic and Atmospheric Administration (2014)
- Bren School of Environmental Science and Management, University of California, Santa Barbara (2014)
- Department of Ecology and Evolutionary Biology, Princeton University (2013)
- Station d'Ecologie Expérimentale du CNRS à Moulis, Moulis, France (2013)
- Department of Applied Economics, University of Minnesota (2011)

Organized Symposia

- “Synergies between ecology and economics: Cross-pollination and gains from trade”, 2015 Annual Meeting of the Ecological Society of America, Baltimore, Maryland, USA (co-organizer L.E. Dee)

Conference Presentations

- American Geophysical Ocean Sciences Meeting, virtual (2022, scheduled)
- American Geophysical Union Fall Meeting, New Orleans, LA and virtual (2021)
- Front Range Energy Economics Workshop, Boulder, CO (2021)
- North American Congress for Conservation Biology, Denver, CO (2020)
- United States Society for Ecological Economics 10th Biennial Conference, Louisville, KY (2019)
- University Climate Change Coalition Vancouver Summit (Panel), Vancouver, Canada (2019)
- CU Environmental and Resource Economics Workshop, Vail, CO (2018)
- IMBeR IMBIZO V, Woods Hole, MA (2017)
- World Fisheries Congress, Busan, South Korea (2016)
- IMBeR IMBIZO IV, Trieste, Italy (2015)
- Annual Meeting of the Ecological Society of America, Baltimore, MD (2015)
- Annual Meeting of the American Fisheries Society, Quebec City, Canada (2014)
- Annual Meeting of the Ecological Society of America, Minneapolis, MN (2013)
- MABIES (Mathematics of Bio-economics Workshop), Paris France (2013)
- Annual Meeting of the American Fisheries Society, St. Paul, MN (2012)
- ICES Annual Science Conference, Gdansk, Poland (2011)
- World Conference on Natural Resource Modeling, Ottawa, Canada (2011)

Service

- Referee for *Science*, *Science Advances*, *Nature Sustainability*, *Nature Food*, *Proceedings of the National Academy of Sciences*, *Journal of the Association of Environmental and Resource Economists (JAERE)*, *Proceedings of the Royal Society B*, *BioScience*, *Global Change Biology*, *Climatic Change*, *Fish and Fisheries*, *Canadian Journal of Fisheries and Aquatic Sciences*, *Marine Policy*, *ICES Journal of Marine Science*, *Ecology and Society*, *Ecological Economics*, *Journal of the Association of Environmental and Resource Economists (JAERE)*, *Journal of Policy Analysis and Management*, *Environmental Modeling and Assessment*, *Marine Environmental Research*, *Ecological Complexity*, *PLoS One*, *Scientific Reports*, *Natural Resource Modeling*, *Methods in Ecology and Evolution*, *Ecological Applications*, *Conservation Letters*, *Endangered Species Research*, *Regional Studies in Marine Science*

- Member of Steering Committee for UN Human Rights Right Here, Right Now Global Climate Summit, Boulder, CO (2021-2022)
- Member of CIRES Strategic Planning Group (2021)
- Member of CIRES Social Science Working Group (2021)
- Referee for Pew report on agent-based modeling (2020)
- Facilitator and organizer of University of Colorado Reducing Polarization Dialogs series (2020-present)
- Member of ENV5 1001 redesign task force, Environmental Studies Program, University of Colorado Boulder (2020-present)
- Member of Carbon Pricing Affinity Group, University Climate Change Coalition (UC3) (2019-present)
- Member of Heterodox Academy (2018-present) and HxEconomics (2021-present)
- Undergraduate Curriculum Committee, Environmental Studies Program, University of Colorado Boulder (2018-present)
- Core Faculty, Center for Science and Technology Policy Research, University of Colorado Boulder (2018-2020)
- Volunteer consultant on the design of an aquarium exhibit on fishery bycatch, Aquarium of the Pacific and ArtCenter College of Design (2018)
- University College Alumni Career Mentorship Program, University of Toronto (2013-2014)

Selected Popular Media Activities

- “Want to Reduce Polarization? Pass These Climate Policies” (article in *Arc Digital*, with Renae Marshall, September 20, 2021)
- “What if a Presidential candidate ran on what most Americans actually wanted?” (article in *Arc Digital*, with Renae Marshall, July 25, 2020)
- Interview on CBS Denver (May 25, 2020)
- “Ecological economics, dangerous ideas, and academic freedom” (article in *Prometheus*, March 10, 2020)
- “Elon Musk deserves the Nobel Peace Prize” (article in *Prometheus*, October 4, 2018)
- Interview on How on Earth, KGNU radio (October 24, 2018)
- “New US seafood rule shows global trade and conservation can work together” (article in *The Conversation*, January 10, 2017; reposted by *Huffington Post*, January 17, 2017)
- “Could balanced harvesting really feed the world and save the oceans?” (article in *The Conversation*, July 13, 2015; reposted by Davos World Economic Forum’s *Agenda*, July 17, 2015)
- Interviews on The Fisheries Broadcast, CBC Radio One (September 20, 2013; November 12, 2014)
- “Turning the PC household debt analogy on its head” (article in *The Hamilton Spectator*, May 30, 2014)
- “Carbon pricing models” (letter in *The Globe and Mail*, January 16, 2015)
- “Climate is a centrist issue” (letter in *The Globe and Mail*, June 14, 2014)