

BENJAMIN P. GOLDSTEIN

CONTACT

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CURRENT POSITION

Postdoctoral Research Fellow

School for Environment and Sustainability
Erb Institute for Global Sustainable Enterprise
University of Michigan

EDUCATION

- Ph.D. Technical University of Denmark, 2017
Concentration: Management Engineering
Dissertation: Assessing the Edible City - The Environmental Implications of Urban Agriculture in the Northeast United States
- M.Sc. Technical University of Denmark, 2013
Concentration: Environmental Engineering, Environmental Management Track
- B.A.Sc. University of Toronto, 2007
Concentration: Chemical Engineering

ACADEMIC APPOINTMENTS

2018-Present Postdoctoral Research Fellow

School for Environment and Sustainability, University of Michigan

2013-2017 Graduate Researcher

Department of Management Engineering, Technical University of Denmark

2014-2015 Visiting Scholar

School of Architecture & Planning, Massachusetts Institute of Technology

2005 Undergraduate Research Assistant

Department of Electrical Engineering, University of Toronto

INDUSTRY EXPERIENCE

2009-2013 Environmental Engineer

AEL Environmental Engineering, Mississauga, Canada

RESEARCH INTERESTS

Key Words urban sustainability · urban informatics · industrial ecology · political ecology · supply chain transparency · urban-rural linkages · meat · urban agriculture

Themes Environmental footprints of cities: I develop methods to better quantify the environmental and social impacts of urban consumption both within and beyond city borders. I do this by combining tools from industrial ecology and geography with novel data sources.

Supply chains and sustainability: I advance methods to unveil the innerworkings of supply chains that deliver consumer goods from distant locations to urban centers. I am particularly interested in revealing the unequal distribution of costs and gains along supply chains.

PUBLICATIONS

Refereed Journal Articles

15. 2020. Chamanara S., **Goldstein B.** & Newell J.P., Where is the Beef? Costco's Beef Supply Chain and Environmental Justice in California. *Journal of Cleaner Production* (In Press)
14. 2020. **Goldstein B.**, Dimitrios Gounaridis & Newell J.P., The carbon footprint of household energy use in the United States. *Proceedings of the National Academy of Sciences of U.S.A.*, 117(22). DOI: 10.1073/pnas.1922205117
13. 2019. **Goldstein B.** & Newell J.P., How to track corporations across space and time. *Ecological Economics*, 169. DOI: 10.1016/j.ecolecon.2019.106492
12. 2019. **Goldstein B.** & Newell J.P., Why academics should study the supply chains of individual corporations. *Journal of Industrial Ecology*. DOI: 10.1111/jiec.12932
11. 2019. Newell J.P., **Goldstein B.** & Foster A., A 40-year review of food-energy-water nexus literature and its application to the urban scale. *Environmental Research Letters*, 14(7). DOI: 10.1088/1748-9326/ab0767
10. 2019. Sohn J., Kalbar P., **Goldstein B.** & Birkved, M., Defining Temporally Dynamic Life Cycle Assessment: A Literature Review. *Integrated Environmental Assessment and Management*. DOI: <https://doi.org/10.1002/ieam.4235>
9. 2017. Mohareb E., Heller M., Novak P., **Goldstein B.**, Fonoll X. & Raskin L., Considerations for reducing food system energy demand while scaling up urban agriculture. *Environmental Research Letters*, 12(12). DOI: 10.1088/1748-9326/aa889b
8. 2017. **Goldstein B.**, Moses R., Sammons N. & Birkved M., Potential to curb the environmental burdens of American beef consumption using a novel plant-based beef substitute. *PLoS One*, 12(12). DOI: 10.1371/journal.pone.0189029
7. 2017. **Goldstein B.**, Birkved M., Fernández J. & Hauschild, M. Contributions of Local Farming to Urban Sustainability in the Northeast United States. *Environmental Science & Technology*, 51(13):7340-7349. DOI: 10.1021/acs.est.7b01011

6. 2017. **Goldstein B.**, Birkved M., Fernández J. & Hauschild, M. Surveying the environmental footprint of urban food consumption. *Journal of Industrial Ecology*, 21(1):151-165. DOI: 10.1111/jiec.12384
5. 2016. **Goldstein B.**, Birkved M., Fernández J. & Hauschild, M. Testing the environmental performance of urban agriculture as a food supply in northern climates. *Journal of Cleaner Production*, 135:984-994. DOI: 10.1016/j.jclepro.2016.07.004
4. 2016. **Goldstein B.**, Hauschild M., Fernández J. & Birkved M. Urban versus conventional agriculture, taxonomy of resource profiles: a review. *Agronomy for Sustainable Development*, 36(9). DOI: 10.1007/s13593-015-0348-4
3. 2016. **Goldstein B.**, Hansen S.F., Gjerris M., Laurent A. & Birkved M. Ethical aspects of life cycle assessments of diets. *Food Policy*. 59:139-151. DOI: 10.1016/j.foodpol.2016.01.006
2. 2013. **Goldstein B.**, Birkved M., Quitzau M-J, & Hauschild M., Quantification of urban metabolism by coupling with the life cycle assessment framework: concept development and case study. *Environmental Research Letters*, 8. DOI: 10.1088/1748-9326/8/3/035024
1. 2013. **Goldstein B.**, Herbøl M. & Figueiroa M. Gaps in tools assessing the energy implications of renovation versus rebuilding decisions. *Current Opinion Environmental Sustainability*, 5(2):244-250. DOI: 10.1016/j.cosust.2013.03.

Refereed Book Chapters

1. 2017. **Goldstein B.** & Rasmussen F.N., "LCAs of Buildings and the Built Environment" pp. 695-722, In *Life Cycle Assessment: Theory and Practice*, ed. Hauschild M., Rosenbaum R. & Olsen S. Heidelberg: Springer. DOI: 10.1007/978-3-319-56475-3

Refereed Conference Proceedings

2. 2014. **Goldstein B.**, Birkved M., Hauschild, M. & Fernández J. Urban agricultural typologies and the need to quantify their potential to reduce a city's environmental 'foodprint'. *World Sustainable Buildings Conference 2014*, Barcelona, Spain
1. 2013. Birkved, M. & **Goldstein, B.**, Environmental sustainability assessment of urban systems applying coupled urban metabolism and life cycle assessment. *Sustainable Buildings Conference 2013*, Graz, Austria

Other Publications

3. 2019. **Goldstein B.** & Newell J.P. New Ways to Study the Supply Chains of Individual Corporations. ICYMI! (Fall Issue). Official Publication of the Erb Institute for Sustainable Enterprise.
2. 2019. **Goldstein B.** The Five Ws of Supply Chains: Who, What, When, Where and Why Your Should Care. ICYMI! (Spring Issue).
1. 2017. Ernststoff A., Stylianou K. & **Goldstein B.**, Response to: Dietary strategies to reduce environmental impact must be nutritionally complete. *Journal of Cleaner Production*, 168:568-570. DOI: 10.1016/j.jclepro.2017.05.205

FUNDING

External Funding

- \$313,049 *The Sustainability Hoofprint of Cities - A Spatial Model to Assess Transboundary Urban Consumption.* National Science Foundation (NSF), 2018-2021. PI: Newell J.P. (U. Michigan). Co-PI: Schmitt J. (U. Minnesota). Senior Personnel: **Goldstein B** and Pelton R. (U. Minnesota)
- \$234,590 *The FEW-Meter - An Integrative Model to Measure and Improve Urban Agriculture, Shifting It Towards Circular Urban Metabolism.* Belmont Forum/NSF, 2018-2021. PI: Newell J.P. (U. Michigan). Senior Personnel: **Goldstein B**
- \$4,000 *Assessing the Edible City: Environmental Implications of Urban Agriculture in the Northeast United States.* Jorck and Hustrus Grant in Support of Graduate Research: Reinhold Fund, 2014. PI: **Goldstein B.**
- \$4,000 *Assessing the Edible City: Environmental Implications of Urban Agriculture in the Northeast United States.* International Study Bursary for Graduate Research: Augustinus Fund, 2014. PI: **Goldstein B.**

Internal Funding & Awards

- \$1,000 *Young Researcher Award.* 2017. Technical University of Denmark. Awarded to one graduating Ph.D. student from each department based on demonstrated research excellence.
- \$1,000 *International Student Scholarship.* 2012. Technical University of Denmark. Awarded to top four international graduate students in university based on GPA.

SCHOLARLY TALKS

Sessions Organized or Chaired

- 2019 "Urban-rural linkages: theory, case studies and future [I,II]." *American Association of Geographers 2019 Annual Meeting.* Paper session organizer: **Goldstein B.** & Chamanara S. Washington, DC. April 7. *Two Sessions.*

Conference Paper, Panel and Poster Presentations

- 2019 "Linking Urban and Rural by Tracking Corporate Actors Across Space and Time," with Newell J.P. *American Association of Geographers 2019 Annual Meeting.* Washington, DC. April 7.
- 2018 "Firm-Centered Approaches to Industrial Ecology," with Newell J.P. *Gordon Research Conference on Industrial Ecology.* Les Diatribes, Switzerland. May 22.
- 2017 "Assessing the Edible City," *9th Conference for Industrial Ecology.* University of Illinois at Chicago, Chicago, Illinois. June 28.
- 2016 "Testing the environmental performance of urban agriculture as a food supply in northern climates," with Fernandez J., Birkved M. & Hauschild M. *Gordon Research Conference on Industrial Ecology.* Stowe, Vermont. June 24.

- 2015 "Quantifying Urban Foodprints and Mitigation Opportunities," with Fernandez J., Birkved M. & Hauschild M. *8th Conference for Industrial Ecology*. University of Surrey, Guildford, United Kingdom. July 8.
- 2014 "Urban 'Food-prints' and Urban Agriculture - Supplying Food in an Urbanizing World," *World Sustainable Building Conference 2014*. Barcelona, Spain. October 29.
- 2014 "Urban Agricultural Typologies and the Need to Quantify their Potential to Reduce a City's Environmental 'Foodprint'," *5th NorLCA Biennial Case Symposium*. Reykjavik, Iceland. October 2.
- 2012 "Application of LCA to Urban Metabolism as a Method for Gauging Urban Sustainability," *Society of Environmental Toxicology and Chemistry 18th LCA Case Study Symposium*. Copenhagen, DK. November 26.

University of Michigan/Technical University of Denmark Campus Talks

- 2019 "Revealing Supply Chains to Increase Sustainability and Reduce Risk," with Newell J.P. *Center for Sustainable Systems Board of Directors Meeting*. University of Michigan. March 15.
- 2019 "Revealing Supply Chains to Increase Sustainability and Reduce Risk," with Newell J.P. *MUSE Conference 2019*. University of Michigan. February 22.
- 2015 "Testing the Assertion that Urban Agriculture is Sustainable," *DTU Sustain Confernce 2019* Technical University of Denmark. December 17
- 2015 "Assessing the Edible City," Guest Lecture for *Sustainability and Life Cycle Assessment* Undergraduate Course, Department of Civil Engineering, Technical University of Denmark October 19.
- 2014 "The Sustainability of Urban Agriculture from a Life Cycle Perspective," Guest Lecture for *Sustainability and Life Cycle Assessment* Undergraduate Course, Department of Civil Engineering, Technical University of Denmark. October 19.

TEACHING

Courses at University of Michigan

Course: Urban Sustainability (Fall 2018)

Role: Instructor of Record

Department: School for Environment and Sustainability

Description: This course introduces graduate students to the field of urban sustainability through the lenses of industrial ecology, urban political ecology, and urban ecology. The course provides students with the theoretical and methodological tools to analyze complex urban sustainability challenges. Students learn about a range of solutions to foster a sustainable urban future, ranging from localization, to industrial symbiosis, to ecological restoration. There is a focus on case-based teaching, where students apply varying disciplinary viewpoints, frameworks, and analytical tools to diagnose and propose solutions to a real-world urban sustainability challenge over the course of the term.

Courses at Technical University of Denmark

Course: Introduction to Life Cycle Assessment (Fall 2014, Fall 2015, Fall 2016)

Role: Teaching Assistant

Department: Management Engineering

Description: This course introduces graduate students to the life cycle assessment (LCA) method of environmental footprinting. This course provides students with the methodological background to perform ISO compliant LCAs of products and services and critically interpret published LCA results. Students learn how to develop a conceptual a model of a production system, to use industry standard LCA software (SimaPro) to estimate the environmental impacts, and to interpret LCA results. Case-based teaching helps the students develop their skills by performing an LCA of a real-life product with an industry partner. My contribution included designing and grading assignments, and annually advising 3-4 groups on their case study.

STUDENTS SUPERVISED

Doctoral Examination Committee

- 2023 [Est.] Calli VanderWilde, Doctoral Candidate, School for Environment and Sustainability, University of Michigan. *A Political-Industrial Ecology of Palm Oil from Guatemala.*
- 2022 [Est.] Sanaz Chamanara, Doctoral Candidate, School for Environment and Sustainability, University of Michigan. *Environmental Justice and Governance of Beef Supply Chains.*
- 2020 Joshua Sohn, Department of Management Engineering, Technical University of Denmark. *Environmental Sustainability Assessment of Advanced Agricultural Waste Technologies and Agricultural Territories.* [External Examiner]

Doctoral Advisory Board/Steering Committee

- 2020 [Est.] Thomas Eliot, Luxembourg Institute of Science and Technology. *Ecosystem Service Toolbox developed from multi-scale Integrated Modelling of Urban Metabolism.* [External Advisor]
- 2022 [Est.] Erica Dorr, AgroTech Paris. *Creation of a Simplified LCA Tool for Urban Agriculture.* [External Steering Committee Member]

Master's Thesis Co-Chair/Committee

- 2020 [Est.] Kimin Cho, University of Michigan. *The influence of U.S. avocado demand on the environment and peoples of Michoacán, Mexico.*
- 2016 Leire Diez Larrea, Technical University of Denmark. *Management of urban nutrient cycles and sinks in the City of Copenhagen.*
- 2016 Saimonas Skurichinas, Technical University of Denmark. *Urban nutrient cycles and sinks in the City of Copenhagen.*
- 2014 Andreas Secher, Technical University of Denmark. *DGNB New Urban District Method in Sustainable Planning*

Graduate Researchers Supervised

Christian Noyce, University of Michigan. Spring 2019
Linnea Carver, University of Michigan. Fall 2018
Katherine Cunningham, University of Michigan. Fall 2018

Undergraduate Researchers Supervised

University of Michigan: Emily Wolfe (Summer 2019), Lydia Whitbeck (Spring 2019), Jianella Macalino (Spring 2019)

Technical University of Denmark: Davide Casella (Bachelor's Thesis. 2016), Michael Reymann (Bachelor's Thesis. 2016), Cindy Jespersen (Bachelor's Thesis. 2014), Ida Christensen (Bachelor's Thesis. 2014)

PROFESSIONAL SERVICE & MEMBERSHIP

Invited Referee

Journal Manuscripts: Agronomy for Sustainable Development; Challenges for Sustainability; Current Opinions in Environmental Sustainability; Environmental Research Letters; Environmental Science & Technology; Environmental Science & Policy; Global Environmental Change; Journal of Industrial Ecology; Journal of Cleaner Production; Organization & Environment; Resources, Conservation & Recycling; Sustainability; Sustainable Cities and Society.

Conference Proceedings: Procedia CIRP.

Technical University of Denmark Service

2014-2016 Head of Social Media and Public Outreach, Division for Quantitative Sustainability Assessment
2015-2016 Head of Graduate Student Society, Division for Quantitative Sustainability Assessment

Memberships

International Society for Industrial Ecology
American Association of Geographers
Ontario Society of Professional Engineers [2009-2013]
Danish Society of Engineers [2012-2018]

ADDITIONAL DETAILS

Selected Media Coverage

2020 *Planetzen*, "One U.S. State Boasts 33% Fewer Carbon Emissions Per Capita Than Any Other," August
Associated Press, "Rich Americans spew more carbon pollution at home than poor," July
CNN, "Wealthy American homes have carbon footprint 25% higher than low-income residences," July
The Guardian, "Rich Americans' homes generate 25% more greenhouse gasses than those less affluent," July
Thomson-Reuters, "High household energy use could thwart U.S. emissions cuts, a study warns," July

- 2020 *Gizmodo*, "McMansions will doom us all," July
United Press International, Wealthier in U.S. have larger carbon footprints, energy use survey shows," July
The Washington Examiner, "Smaller houses and denser neighborhoods needed to slash homes' carbon footprint, researchers say," July
- 2017 *Bloomberg*, "Urban agriculture won't save us from climate change," June
Discover Channel, *Seeker Magazine*, "Urban farming isn't a game changer when it comes to climate change," June

Languages

Native English

Intermediate Danish