

# Jonah M. Greene

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## Formal Education

### **Doctor of Philosophy (Ph.D.); Systems Engineering (in progress)**

Colorado State University | August 2023 | GPA: 4.0

### **Master of Science (M.S.); Mechanical Engineering**

Colorado State University | July 2019 | GPA: 3.55

### **Bachelor of Science (B.S.); Mechanical Engineering**

Colorado State University | May 2018 | GPA: 3.68

### **International Baccalaureate Diploma**

Poudre High School | May 2012 | GPA: 4.0

## Research & Work Experience

### **Chief Technical Officer (CTO)**

Sustainability Science, LLC | Fort Collins, CO | July 2019 – Present

- Techno-economic analysis and life cycle assessment
- Robust process modeling of various bio-based systems
- Collaborating with industry and external research institutions

### **Research Associate IV**

Colorado State University | Fort Collins, CO | July 2023 – Present

*\*Research Associate III (September 2020 – July 2023)*

*\*Research Associate II (July 2019 – September 2020)*

- Developing/validating spatiotemporal models for algae growth and conversion technologies
- Detailed techno-economic and life cycle assessment of various emerging technologies
- Collaborating with national labs and industry professionals to reach performance targets

### **Graduate Research Assistant**

Colorado State University | Fort Collins, CO | May 2018 – July 2019

- Quantified the economic and environmental performance of a novel offshore macroalgae biorefinery
- Investigated the economic performance of micro-utility systems for developing countries

## Peer-Reviewed Publications

1. D Quiroz, **JM Greene**, BJ Limb, JC Quinn. “Global Life Cycle and Techno-Economic Assessment of Algal-Based Biofuels.” *Environmental Science & Technology (ES&T)*, August 2023.
2. I Echenique-Subiabre, **JM Greene**, A Ryan, H Martinez, M Balleza, J Gerber, A Jebali, S Getto, CJ O’Kelly, S Mandal, JC Quinn, SR Starkenburg, AA Corcoran, JB Shurin. “Site-specific Factors Override Local Climatic Conditions in Determining Microalgae Productivity in Open Raceway Ponds.” *Algal Research*, April 2023.
3. **JM Greene**, GM Cole, JC Quinn, B McDaniel, L Kemp, D Simmons, T Hodges, D Nobles, TL Weiss, J McGowen, S McDaniel. “Integrated techno-economic and life cycle assessment of a novel algae-based coating for direct air carbon capture and sequestration.” *Journal of CO2 Utilization*, February 2023.
4. **JM Greene**, HR Hosanna, B Willson, JC Quinn. “Whole Life Embodied Carbon Emissions and Net-Zero Emissions Potential for a Mid-Rise Office Building Constructed with Mass Timber.” *Sustainable Materials & Technologies (SM&T)*, October 2022.

5. D Quiroz, **JM Greene**, JC Quinn. “Regionalized life-cycle water impacts of microalgal-based biofuels in the US.” Environmental Science & Technology (ES&T), October 2022.
6. D Quiroz, **JM Greene**, J McGowen, JC Quinn. “Geographical assessment of open pond algal productivity and evaporation losses across the United States.” Algal Research, December 2021.
7. **JM Greene**, D Quiroz, S Compton, PJ Lammers, JC Quinn. “A validated thermal and biological model for predicting algal productivity in large scale outdoor cultivation systems.” Algal Research, January 2021.
8. Z Cui, **JM Greene**, F Cheng, JC Quinn, U Jena, CE Brewer. “Co-hydrothermal liquefaction of wastewater-grown algae and crude glycerol: A novel strategy of bio-crude oil-aqueous separation and techno-economic analysis for bio-crude oil recovery and upgrading.” Algal Research, October 2020.
9. **JM Greene**, J Gulden, G Wood, M Huesemann, JC Quinn. “Techno-economic analysis and global warming potential of a novel offshore macroalgae biorefinery.” Algal Research, August 2020.

### Conference Presentations

‡ indicates oral podium presentation

1. ‡**JM Greene**, GM Cole, D Quiroz, JC Quinn. “Evaluating the potential of microalgae and macroalgae grown in open raceway ponds for direct air carbon capture and sequestration.” Algae Biomass Summit (ABO), Madison WI, October 2023.
2. ‡**JM Greene**, D Quiroz, S Compton, JC Quinn. “Sustainable aviation fuel from microalgae: Defining performance targets for economic and environmental sustainability through spatiotemporal techno-economic analysis and life cycle assessment.” Algae Biomass Summit (ABO), Madison WI, October 2023.
3. ‡**JM Greene**, SJ Edmundson, CF Hibbeln, AJ Schmidt, M Huesemann, JC Quinn. “Reimagining the on-shore macroalgae biorefinery: Cultivation of Ulva in open raceways to provide a domestic source of critical minerals, valuable nutrients, and renewable fuels.” Algae Biomass Summit (ABO), Madison, WI, October 2023.
4. ‡**JM Greene**, D Quiroz, S Compton, JC Quinn. “Spatiotemporal microalgae growth modeling coupled with techno-economic analysis and life cycle assessment of algae-to-fuel pathways for the production of renewable transportation fuels.” International Conference on Algal Biomass, Biofuels, and Bioproducts (ABBB); Kailua-Kona, HI, June 2023.
5. **JM Greene**, SJ Edmundson, CF Hibbeln, AJ Schmidt, M Huesemann, JC Quinn. “Techno-economic analysis and life cycle assessment of an on-shore macroalgae biorefinery to produce renewable transportation fuels and recover critical minerals, nutrients, and carbon from seawater.” International Conference on Algal Biomass, Biofuels, and Bioproducts (ABBB); Kailua-Kona, HI, June 2023.
6. ‡**JM Greene**, M Belleza, A Corcoran, I Echenique, J Gerber, S Getto, O Holguin, A Jebali, H Martinez, J Nalley, C O’Kelly, SR Starckenburg, J Shurin, JC Quinn. “Hindcasting of algal productivity in open raceway ponds to quantify the impacts of various pest pressures.” Algae Biomass Summit – Algae Biomass Organization (ABO); Virtual Conference; Sept – Oct 2022.
7. ‡**JM Greene**, D Quiroz, KF Reardon, J Adkins, JC Quinn. “Life cycle assessment of suspended algal cultures in outdoor open pond systems: investigating carbon utilization efficiency and CO<sub>2</sub> sourcing.” Algae Biomass Summit – Algae Biomass Organization (ABO); Virtual Conference; Sept – Oct 2022.
8. ‡**JM Greene**, D Quiroz, S Compton, JC Quinn. “Modeling algae cultivation at scale: Productivity, pond reliability, and resource consumption across the United States.” International Symposium on Sustainable Systems and Technology (ISSST); Pittsburgh, PA; June 2022.
9. ‡**JM Greene**, R Hosanna, B Willson, JC Quinn. “The role of WBLCA in defining, realizing, and elevating sustainability goals for building design.” International Mass Timber Conference (IMTC); Portland, OR; April 2022.

10. †**JM Greene**, D Quiroz, A Corcoran, J Nalley, JC Quinn. “Integrating high-resolution growth modeling with pond reliability metrics to model the economic and environmental performance of algae cultivation at scale.” Algae Biomass Summit – Algae Biomass Organization (ABO); Virtual Conference; September 2021.
11. †**JM Greene**, JC Quinn. “Life Cycle Assessment of Greenhouse Hemp Production in Southern Colorado.” Virtual Cannabis Research Conference (CRC); Virtual Conference; August 2021.
12. **JM Greene**, D Quiroz, S Compton, PJ Lammers, JC Quinn. “Open-Source Collaboration: A new era of cooperation for the evaluation and implementation of sustainable technologies.” International Symposium on Sustainable Systems and Technology (ISSST); Virtual Conference; June 2021.
13. †**JM Greene**, J Walston, B Willson, JC Quinn. “The Net-Zero Carbon Building: Utilizing Life Cycle Assessment to evaluate the net-zero carbon potential of mass timber construction.” International Symposium on Sustainable Systems and Technology (ISSST); Virtual Conference; June 2021.
14. †**JM Greene**, Z Cui, F Cheng, CE Brewer, U Jena, JC Quinn. “Reducing the Cost of Renewable Fuel Production using Co-Hydrothermal Liquefaction of Microalgae and Crude Glycerol.” Algal Biomass Biofuels and Bioproducts (ABBB); Virtual Conference; June 2021.
15. **JM Greene**, C Hawthorne, K Reardon, D Dandy, JC Quinn. “Evaluating the Economic Impacts of Using Enzymatic Membranes to Optimize Bicarbonate Production and Delivery to Open Raceway Ponds.” Algal Biomass Biofuels and Bioproducts (ABBB); Virtual Conference; June 2021.
16. †**JM Greene**, D Quiroz, S Compton, JC Quinn. “Utilizing Dynamic Growth Modeling to Add Temporal and Regional Resolution to Techno-Economic and Life-Cycle Models of Microalgae Biofuel Systems.” Algae Biomass Summit - Algae Biomass Organization (ABO); Virtual Conference; September 2020.
17. †**JM Greene**, Z Cui, F Cheng, U Jena, CE Brewer, JC Quinn. “Driving Down the Cost of Renewable Fuel Production through Co-Hydrothermal Liquefaction of Microalgae and Crude Glycerol.” Algae Biomass Summit - Algae Biomass Organization (ABO); Virtual Conference; September 2020.
18. †**JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Techno-Economic and Life Cycle Analysis of a Macroalgae Biorefinery: Using a Modular Approach to Quantify the Impacts of Emerging Technology on System Performance.” LCA XIX - American Center for Life Cycle Assessment (ACLCA); Tucson, AZ, September 2019.
19. †**JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Utilizing Techno-Economic Modeling to Identify Effective Methods to Reduce the Cost of Fuel Production from Macroalgae.” Algae Biomass Summit - Algae Biomass Organization (ABO); Orlando, FL, September 2019.
20. †**JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Utilizing Life Cycle and Economic Modeling to Identify Effective Methods of Reducing Greenhouse Gas Emissions and Fuel Selling Price for a Marine Macroalgae Biorefinery.” Algal Biomass Biofuels and Bioproducts (ABBB); Boulder, CO, June 2019.
21. †**JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Evaluating the Economic Viability of Offshore Macroalgae Production and the Impacts of Emerging Technologies and Downstream Processing into Bio-Products.” Aquaculture 2019; New Orleans, LA, March 2019.
22. **JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Modeling the Techno-Economic Feasibility of Bio-fuels Production from Marine Macroalgae.” Algae Biomass Summit - Algae Biomass Organization (ABO); Houston, TX, October 2018.
23. **JM Greene**, M Huesemann, J Gulden, GM Wood, T Mumford, JC Quinn. “Environmental Impact of a Macroalgae Biorefinery.” LCA XVIII - American Center for Life Cycle Assessment (ACLCA); Fort Collins, CO, September 2018.

## Contracts & Grants

### Externally Funded Projects as Technical Lead for TEA/LCA Tasks:

Years	Project Title	Organizations	Funding	Project Type
2021 – 2023	UNrealized Critical Lanthanide Extraction via Sea Algae Mining (UNCLE-SAM): Domestic production of critical minerals from seawater	CSU, PNNL, ARPA-e, DOE	<b>\$1,000,000</b>	DOE Award Number: FOA-00001953
2020 – 2021	Living Ink: Life Cycle Analysis of algae-based black pigments compared to Carbon Black	CSU, Living Ink	<b>\$12,500</b>	CSU – Energy Institute
2020 – Present	Optimizing Selection Pressures and Pest Management to Maximize Algal Biomass Yield (OSPREY)	CSU, LANL, NMSU, UCSD, Qualitas Health, DOE	<b>\$6,250,000</b>	DOE Award Number: DE-EE0008902
2019 – Present	Integrating an Industrial Source and Commercial Algae Farm with Innovative CO <sub>2</sub> Transfer Membrane and Improved Strain Technologies	CSU, NREL, Qualitas Health, DOE	<b>\$4,864,565</b>	DOE Award Number: DE-EE0008514
2020	Power House II: Analysis of Carbon Emissions and Methods of Reaching Net Zero Carbon	CSU, Neenan Archistructure	<b>\$5,000</b>	CSU-Energy Institute
2019	Platte River Power Authority: Life Cycle Impact Assessment Support	CSU, Platte River Power Authority	<b>\$60,471</b>	Contract
2019	Techno-Economic Evaluation of an Integrated Micro-Utility Concept for Developing Countries	CSU, Factor[e] Ventures, WASE, Sistema.Bio	<b>\$50,000</b>	Contract
2018 – 2019	Techno-Economic Analysis and Life Cycle Assessment of the Nautical Offshore Macroalgal Autonomous Device (NOMAD)	CSU, PNNL, OSU, ARPA-e, DOE	<b>\$500,000</b>	DOE Award Number: DE-AR0000913

### References (More Available on Request)

**Dr. Jason Quinn** | CSU | Graduate/Current Advisor

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**Dr. Michael Huesemann** | PNNL | NOMAD Project PI

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**Dr. John Petro** | CSU | Undergraduate Professor

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