

## William Joseph Sagues

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### EDUCATION

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<b>PhD, Forest Biomaterials</b> North Carolina State University	January 2018 - August 2020
<b>MSc, Chemical Engineering</b> University of Florida	August 2015 - December 2017
<b>MSc, Agricultural &amp; Biological Engineering</b> University of Florida	August 2015 - December 2017
<b>BSc, Agricultural &amp; Biological Engineering</b> University of Florida	August 2009 - May 2012

### PROFESSIONAL APPOINTMENTS

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<b>Assistant Professor</b> Director of the Biocarbon Utilization & Sequestration (BUS) Laboratory Biological & Agricultural Engineering North Carolina State University	August 2020 - present
<b>Graduate Student Research (SCGSR) Fellow</b> Office of Science, U.S. Department of Energy Host Site: National Renewable Energy Laboratory	January 2020 - August 2020
<b>Graduate Research Assistant</b> Department of Forest Biomaterials, North Carolina State University	January 2018 - August 2020
<b>Summer Scholar</b> Green Chemistry Summer School, American Chemical Society	July 2019
<b>Technology-to-Market Scholar</b> Advanced Research Projects Agency (ARPA-E), U.S. Department of Energy	May 2018 - August 2018
<b>Graduate Research Assistant</b> Department of Agricultural & Biological Engineering, University of Florida Department of Chemical Engineering, University of Florida	August 2015 - December 2017
<b>Senior Bioprocess Engineer</b> <b>Bioprocess Engineer</b> Stan Mayfield Biorefinery, Cellulosic Research & Demonstration Plant Florida Center for Renewable Chemicals & Fuels, University of Florida In Partnership with Georgia-Pacific LLC	March 2014 - August 2015 May 2012 - March 2014

### PEER-REVIEWED PUBLICATIONS

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1. L. M. Lower, J. Cunniffe, J. J. Cheng, **W. J. Sagues**. 2021. "Coupling Circularity with Negativity in Food & Agriculture Systems" *Journal of the American Society of Agricultural & Biological Engineers* (in press)  
[doi: 10.13031/ja.14908](https://doi.org/10.13031/ja.14908)

2. **W. J. Sagues**, C. A. Assis, P. Hah, D. L. Sanchez, Z. Johnson, M. Acharya, H. Jameel, and S. Park. 2020. “Decarbonizing Agriculture through the Conversion of Animal Manure to Dietary Protein and Ammonia Fertilizer” *Bioresource Technology* (IF: 5.807), 297  
<https://doi.org/10.1016/j.biortech.2019.122493>
3. **W. J. Sagues**, H. Jameel, S. Park, D. L. Sanchez. 2019. “Enhanced Carbon Dioxide Removal from Coupled Direct Air Capture-Bioenergy Systems” *Sustainable Energy & Fuels* (IF: 4.912), 3, 3135-3146  
<https://doi.org/10.1039/C9SE00384C>
4. **W. J. Sagues**, H. Jameel, D. L. Sanchez, and S. Park. 2020. “Prospects for Bioenergy with Carbon Capture & Storage (BECCS) in the United States Pulp and Paper Industry” *Energy & Environmental Science* (IF: 33.250), 13, 8, 2243-2261  
<https://doi.org/10.1039/D0EE01107J>
5. **W. J. Sagues**, J. Yang, N. Monroe, S. D. Han, T. Vinzant, M. Yung, H. Jameel, M. Nimlos, & S. Park. 2020. “A Simple Method for Producing Bio-Based Anode Materials for Lithium-Ion Batteries” *Green Chemistry* (IF: 9.405), 22, 7093 – 7108  
<https://doi.org/10.1039/D0GC02286A>
6. H. Bao, **W. J. Sagues**, Y. Wang, W. Peng, L. Zhang, S. Yang, D. Xiao, and Z. Tong. 2020. “Depolymerization of Lignin into Monophenolics by Ferrous/Persulfate Reagent Under Mild Conditions” *ChemSusChem* (IF: 7.962)  
<https://doi.org/10.1002/cssc.202002240>
7. **W. J. Sagues**, A. Jain, D. Brown, S. Aggarwal, A. Suarez, M. Kollman, S. Park, D. S. Argyropoulos. 2019. “Are Lignin-Derived Carbon Fibers Graphitic Enough?” *Green Chemistry* (IF: 9.405), 21, 4253-4265  
<https://doi.org/10.1039/C9GC01806A>
8. **W. J. Sagues**, H. Bao, J. Nemenyi, Z. Tong. 2018. “Lignin-First Approach to Biorefining: Utilizing Fenton’s Reagent and Supercritical Ethanol for the Production of Phenolics and Sugars” *ACS Sustainable Chemistry & Engineering* (IF: 6.140), 6, 4, 4958-4965  
<https://doi.org/10.1021/acssuschemeng.7b04500>
9. E. Castro, I. U. Nieves, V. Rondon, **W. J. Sagues**, M. T. Fernandez-Sandoval, L. P. Yomano, S. W. York, J. E. Erickson, W. Vermerris. 2017. “Potential for ethanol production from different sorghum cultivars” *Industrial Crops and Products* (IF: 3.849), 109, 367-373  
<https://doi.org/10.1016/j.indcrop.2017.08.050>
10. K. Gubicza, Z. Barta, I. U. Nieves, **W. J. Sagues**, K. T. Shanmugam, L. O. Ingram. 2016. “Techno-economic analysis of ethanol production from sugarcane bagasse using a Liquefaction plus Simultaneous Saccharification and Co-Fermentation process” *Bioresource Technology* (IF: 5.807), 208, 42-48  
<http://dx.doi.org/10.1016/j.biortech.2016.01.093>
11. E. Castro, I. U. Nieves, M. T. Mullinnix, **W. J. Sagues**, R. W. Hoffman, M.T. Fernandez-Sandoval, Z. Tian, B. Tamang, L. O. Ingram. 2014. “Optimization of dilute-phosphoric-acid steam pretreatment of *Eucalyptus benthamii* for biofuel production” *Applied Energy* (IF: 7.900), 125, 76-83  
<http://dx.doi.org/10.1016/j.apenergy.2014.03.047>

12. C. C. Geddes, M. T. Mullinnix, I. U. Nieves, R. W. Hoffman, **W. J. Sagues**, S. W. York, K. T. Shanmugam, J. E. Erickson, W. Vermerris, L. O. Ingram. 2013. “Seed train development for the fermentation of bagasse from sweet sorghum and sugarcane using a simplified fermentation process” *Bioresource Technology (IF: 5.807)*, 128, 716-724  
<https://doi.org/10.1016/j.biortech.2012.09.121>

## PATENTS

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*Pending*

1. Robert Milton Baldwin, Mark R. Nimlos, Andrew Nolan Wilson, Maarit Kristiina Iisa, Sunky Park, & **William Joseph Sagues**. Valorization of Bio-Oils. 2020. United States Department of Energy & Alliance for Sustainable Energy, LLC. U.S. 16/253,016

## PUBLISHED DATA

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1. J.N. Welch, I.U. Nieves, E. Castro, V. Rondon Berrio, W. Vermerris, K.T. Shanmugam, L.O. Ingram, **W.J. Sagues**. 2021. SMDemoBioref: Data from the Stan Mayfield Demonstration Biorefinery. <https://doi.org/10.5281/zenodo.5682712>

## MEDIA

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1. E. Packard, “NC State Announces 2021-22 Goodnight Early Career Innovators”, <https://news.ncsu.edu/2022/04/nc-state-announces-2021-22-goodnight-early-career-innovators%E2%82%AC/>
2. K. A. Askey, J. Welch, B. Wilson, & W. J. Sagues. 2022 “Bioenergy – Data Boost”, ORNL press release, <https://www.ornl.gov/news/bioenergy-data-boost>
3. W. J. Sagues & M. Grattiri. 2021 “Merging Industry, Academia and National Labs at the Electrosynthesis of Chemicals & Fuels Session”, ACS Nexus, <https://communities.acs.org/t5/GCI-Nexus-Blog/Merging-Industry-Academia-and-National-Labs-at-the/ba-p/85819>
4. W. J. Sagues. 2021. “The Farming We Need”, Indigo Ag Monthly Newsletter, personal quote included in newsletter sent to over 4,000 sustainability officers
5. D. Shore, W. J. Sagues. 2021 “New Faculty Focus: A Focus on Carbon” NCSU press release, <https://www.bae.ncsu.edu/news/2021/new-faculty-focus-a-focus-on-carbon/>
6. W. J. Sagues, 2019, “Forest Biomaterials Joe Sagues Awarded Prestigious US DOE Fellowship”, <https://cnr.ncsu.edu/fb/news/2019/09/forest-biomaterials-joe-sagues-awarded-prestigious-u-s-doe-fellowship/>

## RESEARCH GRANTS FUNDED

### JANUARY 2021 – PRESENT (TOTAL: \$10,536,900)

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Full list of proposals (awarded, pending, and rejected) available by request

\* indicates interinstitutional grant

### Lead Principal Investigator (Total: \$1,433,718)

1. *Carbon Mineralization via Rock Quarry Fines*, Carolina SunRock, 2022, **\$25,004**. PI: **W. Joe Sagues**, Co-PI: A. Woodley
2. *Electrifying Bioproducts via C1 Fermentation*, USDA, 2022, Hatch Multi-State Grant, **\$5,000**. PI: **W. Joe Sagues**
3. *Electrifying Animal Feed: Leveraging Microbial Communities in Formicine Ants to Produce Single Cell Protein via Assimilation of CO<sub>2</sub>-Derived Formic Acid*, Research

Innovation Seed Funding, North Carolina State University, 2022, **\$25,000**. PI: **W. Joe Sagues**, Co-PIs: Elsa Youngsteadt, Amy Grunden, Sung Woo Kim, Kelly Zering, & Doug Call

4. *Electrifying Animal & Fish Feed: Leveraging Microbes in Food Waste Anaerobic Digesters to Produce Single Cell Protein via Assimilation of CO<sub>2</sub>-Derived Formic Acid*, NC Biotechnology Center, 2022, **\$12,477**. PI: **W. Joe Sagues**, Co-PIs: Jay Cheng & Sung Woo Kim
5. *Bioprocess Development for Pulp Liquor Fermentation*, Rayonier Advanced Materials, 2022, **\$23,187**. PI: **W. Joe Sagues**, Co-PIs: Hasan Jameel & Praveen Kolar
6. *Butanol & Nanocellulose from CRISPR-Edited Poplar*, NC Department of Agricultural & Consumer Services, 2021 – 2023, **\$100,000**. PI: **W. Joe Sagues**, Co-PIs: Wayne Yuan, Jack Wang, & Nathalie Lavoine
7. *\*Integrating Carbon Capture, Utilization, & Sequestration into Chemical Pulp Mills*, US Department of Energy's Advanced Manufacturing Office, Award Number: DE-EE0009413, 2021 – 2024, **\$1,273,054**. PI: **W. Joe Sagues**, Co-PIs: Fanxing Li, Rachel Cook, Sunkyu Park, & Hasan Jameel

#### Co-Principal Investigator (Total: \$9,103,182)

1. *New Methods for Methane Pyrolysis*, Eastman Chemical Company, 2022 – 2024, **\$556,536**. PI: Fanxing Li, Co-PIs: **W. Joe Sagues**, Jian Dou, & Wenpei Gao
2. *A Feasibility Assessment of Waste Cotton to Bioenergy with Carbon Removal*, Cotton Incorporated, 2022 – 2024, **\$52,000**. PI: Richard Venditti. Co-PI: **W. Joe Sagues**
3. *\*Getting to Neutral – Options for Negative Emissions in the United States*, US Department of Energy, 2021 – 2024, **\$4,400,000**. PI: Roger Aines (Lawrence Livermore National Laboratory), Co-PIs: **W. Joe Sagues**, Jennifer Pett-Ridge, Sarah Baker, Eric Slessarev, Simon Peng, Corinne Scown, Hanna Brunig, Matt Langholtz, Dan Sanchez, Mark Ashton, Mark Ducey, Mark Bradford, Phil Robertson, Keith Paustian, Dermot Hayes, Jerome Dumortier, Mark Wright, Helen Pilorge, & Susan Hovorka
4. *Enzyme Enhanced Anaerobic Digestion of Source Separated Organics and Municipal Solid Waste*, Novozymes, 2021 – 2022, **\$94,708**. PI: Jay Cheng, Co-PIs: **W. Joe Sagues** & Praveen Kolar.
5. *\*Scaling Up Biocrude Derived Anode Material (BDAM)*, US Department of Energy's Bioenergy Technology Office, DE-FOA-0002203 SCUBA, Control Number: 2203-1679, 2021 – 2025, **\$3,999,938**. PI: Sunkyu Park, Co-PIs: **W. Joe Sagues**, Mark Nimlos (NREL), Steve Kelley, Hasan Jameel, Sang-Don Han (NREL), Yuan Yao (Yale)

#### TEACHING

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Student evaluations available upon request

(All evaluations for 2021 are qualitative due to COVID-19 protocols)

#### North Carolina State University, 2021 – present

1. BAE 495/590: Biocarbon Utilization & Sequestration (3 credits, spring, lead instructor)
  - a. Spring 2021:
    - i. 21 students enrolled from 9 different academic departments
    - ii. 62% student response rate
  - b. Select responses:
    - i. "I truly loved the class. The information was delivered in a very clear way. The assignments were closely connected to the class activities, still challenging enough. The

topics covered in class are of extremely importance in today's society. The abundance of guest speakers made the content of the course so connected to real life! Opportunities to collaborate with others and work in groups were given. Great pacing of the classes; all expectations were made clear at the beginning of the semester and throughout the course; always feedback was provided in a timely, effective manner; good amount of time to complete all the assignments. Excellent teaching and communication instructor skills; high level of delivery of the information; support and help were provided in a quick manner. Overall, excellent course! I would highly recommend it to any student!"

- ii. "This is one of my favorite classes that I have taken in college. The subject matter is very interesting and important to me. I was introduced to plenty of ideas and concepts that I had not heard of before. The professor was very responsive to all questions and feedback. The guest lecture format provided an excellent opportunity for exposure to ideas directly from the source."
2. BAE: 321 Bioprocess Engineering Fundamentals (3 credits, fall, lead instructor)
    - a. Fall 2021:
      - i. 10 students enrolled from 1 academic department
      - ii. 80% student response rate
    - b. Select responses:
      - i. "This was my favorite class this semester as I really enjoyed the material as well as the way it was taught and presented. The two lab sessions we did were a lot of fun, and those are exactly the reason that confirm to me that I love doing what I am. I hope more opportunities like this will stay in this class in the future and become more commonplace in other classes. I thought that all of the material was taught really well and the tests were reasonable."
      - ii. "Dr. Sagues is a very interesting professor to learn from. He works diligently to tailor his course and the material we learn in class to the industry and the interest of the students. I really enjoyed the pace of the course. I actually walked away from each class feeling like the learned something and comprehended it. We had a discussion class period that was very interesting and lead to great participation. It was also nice to feel that he actually cared about the student and their interests. He was very open to feedback and improved throughout the semester. Grades were always returned in a timely manor and problems were explained."
  3. PSE 295/FB 595: Engineering Concepts for the Production of Bio-Based Materials, Chemicals, & Energy (3 credits, every other spring, co-instructor)
    - a. Spring 2021:
      - i. 21 students enrolled from 7 different academic departments
      - ii. 24% student response rate
    - b. Select responses:
      - i. "I thought Dr. Sagues was an excellent lecturer."
      - ii. "Dr. Sagues was very enthusiastic and well-informed on the material, something I really appreciated about his videos. Like Dr. Park, he was very clear when going through examples, and always explained things in a way that made sense, and even when going through some of the simpler concepts, it never felt like he was talking down to the viewer."

#### **USDA Extension, 2020 - present**

1. The Sustainable Bioeconomy – Free online course (co-instructor)
  - a. <https://campus.extension.org/enrol/index.php?id=1641>
2. Biomass Conversion for Bioproducts & Bioenergy – Free online course (co-instructor)
  - a. <https://campus.extension.org/enrol/index.php?id=1642>

#### **MENTORING**

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**Postdoctoral Advising**

Ruo Chen Wu, PhD, Postdoctoral Researcher, October 2021 - present

**Graduate Student Advising*****PhDs in progress as Chair or Co-Chair (Total = 2)***

1. Vanessa Rondon Berrio, BAE, NCSU, 2021 – 2024, *Decoupling Land Use from Protein Production via Microbial Assimilation of CO<sub>2</sub>-Derived Formic Acid*
2. Ethan Woods, BAE, NCSU, 2021 – 2025, *Techno-Economic Assessment of Sequestering CO<sub>2</sub> via Industrial Mineral Residues Applied to Agricultural Soils*

***MS in progress as Chair or Co-Chair (Total = 3)***

1. Trevor Vook, BAE, NCSU, 2020 – 2022, *Catalytic Graphitization of Paper Waste for Green Carbon Anodes*
2. Julia Cunniffe, BAE, NCSU, 2021 – 2023, *Selective Enzyme Hydrolysis to Enhance Cellulose Crystallinity & Generate Fermentable Carbon Substrates*
3. Lillian Lower, BAE, NCSU, 2021 – 2023, *Optimizing Anaerobic Digestion of Lemnaceae-Derived Biocarbon*

***PhDs in progress as Committee Member (Total = 3)***

1. Rodrigo Tello Buitrago, Forest Biomaterials, NCSU, 2018 – 2022, *Life-Cycle Environmental and Economic Assessment of Diverse Pulp Grades – Targeting Energy Efficiency and GHG Reductions based on Process Simulation*
2. Eliezer Reyes Molina, Forest Biomaterials, NCSU, 2018 – 2022, *Graphite Nucleation Induced by Biochar Particles in Bio-Oil*
3. Shaikat Chandra Dey, Forest Biomaterials, NCSU, 2021 – 2024, *Catalytic Graphitization of Biocrude for Green Lithium-Ion Batteries*

***MS in progress as Committee Member (Total = 1)***

1. Matthew Byington, Forest Biomaterials, NCSU, 2020 – 2022, *Optimization of the Graphite Exfoliation & Compression Process*

**Undergraduate Research Assistant Advising**

1. June Khongpatimakorn, BAE, NCSU, 2022 – present
2. Julianne Mahley, BAE, NCSU, 2022 – present
3. Shomari Presswood, BAE, NCSU, 2022 – present
4. Paige Seibert, BAE, NCSU, 2021 – present
5. Delani McKee, BAE, NCSU, 2021 – present
6. Luke Szoch, BAE, NCSU, 2021 – present
7. Nicholas Monroe, Forest Biomaterials, NCSU, 2019 – 2020
8. Thomas Cluen, Forest Biomaterials, NCSU, 2018 – 2019
9. John Nemenyi, ABE, UF, 2015 – 2017
10. Zhonglin Lai, ABE, UF 2015 - 2016

**Awards received by graduate and undergraduate research assistants**

1. Ethan Woods (PhD Student): Technology-to-Market Scholar for the Department of Energy's Advanced Research Projects Agency (ARPA-E), 2022
2. Ethan Woods (PhD Student): Consulting Intern, Aemetis Bioenergy, 2022
3. Julia Cunniffe (MS Student): Consulting Intern, Aemetis Bioenergy, 2022

4. Ethan Woods (PhD Student): Student Delegate, Consortium for Advanced Bioeconomy Leadership Education (CABLE), USDA, 2021 - 2022
5. Julia Cunniffe (MS Student): Student Delegate, Consortium for Advanced Bioeconomy Leadership Education (CABLE), USDA, 2021 – 2022
6. Trevor Vook (MS Student): 2<sup>nd</sup> place, Research Competition, NC Agricultural & Life Sciences, NCSU, 2021
7. Trevor Vook (MS Student): Outstanding Student Presentation, Annual International Meeting, American Society of Agricultural & Biological Engineers, 2021
8. Vanessa Rondon Berrio (PhD Student), Robert O. Evans Fellowship, BAE, NCSU, 2021
9. Luke Szoch (Undergraduate Student): REEP Scholar, BAE, NCSU, 2021 – 2022
10. Paige Seibert (Undergraduate Student): Summer Research Fellow, Office of Undergraduate Research, NCSU, 2021
11. John Nemenyi & Zhonglin Lai (Undergraduate Students): 1<sup>st</sup> place, Research Competition, ABE, UF, 2016

### **Student Organization Advising**

1. Mentor, Senior Design Group in MBA 585: Current Topics in Biosciences Management
2. Mentor, Graduate Student Association, Dept. of Biological & Agricultural Engineering, North Carolina State University, 2021 – present
3. Mentor, Undergraduate Senior Design, Dept. of Chemical Engineering, University of British Columbia, November 2020 – May 2021

### **SELECT HONORS & AWARDS**

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#### International/National Recognition:

1. Goodnight Early Career Innovator, NCSU, 2022
2. Honorary Mentor, Consortium for Advanced Bioeconomy Leadership Education (CABLE), USDA, 2021
3. Graduate Student Research (SCGSR) Fellowship, Office of Science, U.S. Department of Energy, 2020
4. CIBA Research Award, American Chemical Society - Green Chemistry Institute, 2018
5. 1<sup>st</sup> Place – Boyd Scott Graduate Research Award, Annual International Meeting, American Society of Agricultural and Biological Engineers, 2017
6. 1<sup>st</sup> Place – 5-Minute Rapid Fire Presentation + Poster Competition, International Bioproducts Conference, Technical Association of the Pulp & Paper Industry, 2016
7. 1<sup>st</sup> Place – Outstanding Student Presentation in Applied Research 38<sup>th</sup> Symposium on Biotechnology for Fuels & Chemicals, Society for Industrial Microbiology and Biotechnology, 2016
8. Awards Finalist – New Faces of Engineering, New Faces of Engineering – Professional Edition, DiscoverE, National Society of Professional Engineers, 2016
11. Finalist, Andrews Launch Accelerator Startup Competition, Entrepreneurship Clinic, North Carolina State University, 2020
12. Graduate School Fellowship, College of Natural Resources, North Carolina State University, 2018
13. 1<sup>st</sup> Place – Research Poster Symposium, University of Florida’s Chemical Engineering Department, 2017

14. 2<sup>nd</sup> Place – Research Poster Symposium, University of Florida’s Agricultural and Biological Engineering Department, 2017
15. Service Award, Florida Section of the American Society of Agricultural & Biological Engineers, 2016
16. Graduate Student Travel Grant, Graduate Student Council, University of Florida, 2016
17. Graduate Research Fellowship, Informatics Institute, University of Florida, 2016
18. Graduate School Fellowship, College of Engineering, University of Florida, 2015

## **PROFESSIONAL SERVICE**

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### **Grant Program Workshop Participation**

1. US DOE ARPA-E Program on Carbon Farming (2022)
2. US DOE ARPA-E Program on Carbon Sequestering Building Materials (2021)
3. US DOE ARPA-E Program on Decarbonizing the Steel Industry (2021)
4. US DOE BETO Program on Utilizing Biorefinery Data (2020)

### **Grant Proposal Reviewer**

1. US DOE ARPA-E Program on Entrepreneurship in Clean Energy (2021)
2. North Dakota Industrial Commission Program on CO<sub>2</sub> Capture & Utilization (2021)
3. North Dakota Industrial Commission Program on CO<sub>2</sub> Capture & Utilization (2020)
4. US DOE ARPA-E Program on Direct Air Capture and Ocean Capture (2020)

### **Manuscript Reviewer**

1. Biofpr: biofuels, bioproducts, and biorefining (2022)
2. Biofpr: biofuels, bioproducts, and biorefining (2021)
3. Frontiers in Climate (2021)
4. Biofpr: biofuels, bioproducts, and biorefining (2020)

### **Technical Committee Leadership & Membership**

1. Chair, Working Group 1, Task Force to Transform Food & Agriculture to Circular Systems, American Society of Agricultural & Biological Engineers (ASABE), 2021 - present
2. Invited Technical Advisor & Writer, Leveraging Biotechnologies to Mitigate Climate Change – Workshop & Report, University-Industry Demonstration Partnership (UIDP), 2021 - present
3. Chair, Bioprocess Startup Competition, American Society of Agricultural & Biological Engineers (ASABE), 2021 - present
4. Invited Member, ASE-16, Engineering for Sustainability, American Society of Agricultural & Biological Engineers (ASABE), 2021 - present
5. Secretary, Florida Section of the American Society of Agricultural & Biological Engineers, 2015 – 2017

### **Advisory Board Membership**

1. Member of the technical advisory board, Mote Hydrogen LLC, 2021 - present

### **Conference Leadership**

1. Organizer and Moderator, Workshop on Circular Bioeconomy Systems, The American Society of Agricultural & Biological Engineers’ 2022 Annual International Meeting



2. Symposia Director, The American Chemical Society Green Chemistry Institute's 2021 Annual Green Chemistry & Engineering Conference -- Symposia: Electrosynthesis of Chemicals & Fuels (co-sponsored by iScience)
3. Convener and Moderator, Session on Electrosynthesis of Chemicals & Fuels, The American Chemical Society Green Chemistry Institute's 2021 Annual Green Chemistry & Engineering Conference

### Seminar Leadership

1. Coordinator, webinar series on carbon dioxide removal, NCSU, 2021

### Student Engagement

1. Invited Judge, Poster Competition, American Institute of Chemical Engineers – Bioenergy Conference, 2020
2. Professional Development Group Leader, Forest Biomaterials Graduate Student Association, North Carolina State University, 2019
3. Founder & President, Technical Association of the Pulp and Paper Industry Student Chapter, University of Florida, 2016 – 2017
4. President, Biological Engineering Graduate Student Organization, University of Florida, 2016 – 2017
5. Treasurer, Chemical Engineering Graduate Student Organization, University of Florida, 2016 – 2017
6. Pen-Pal, Letters to a Pre-Scientist, 2015 – 2017
7. Invited Judge, State Science & Engineering Fair, Florida Foundation for Future Scientists, 2016
8. Invited Judge, Future City Competition, DiscoverE's National Science Fair, 2016

### Professional Society Membership

1. American Chemical Society, 2017 – present
2. American Society of Agricultural & Biological Engineers, 2015 – present
3. Society for Industrial Microbiology & Biotechnology, 2015 – present
4. Institute of Biological Engineers, 2015 – present
5. Technical Association of the Pulp and Paper Industry, 2015 – 2020
6. American Institute of Chemical Engineering, 2015 - 2020

### SELECT PRESENTATIONS

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*\* indicates invited presentation*

1. **\*W. J. Sagues**. 2022. “Bioeconomy Supply Chains & Conversion Processes for Carbon Removal”. Oral presentation at US Department of Energy’s Advanced Research Projects Agency’s Workshop on Carbon Farming
2. **\*W. J. Sagues**. 2022. “Opportunities for Industrial Carbon Mineralization”. Oral presentation to the company Nouryon.
3. P. Seibert, V. Rondon Berrio, D. McKee, **W. J. Sagues**. 2022. “Biological Conversion of Cotton Residues to Bioplastic & Proteins via Wild Fermentation”. Poster presentation at NCSU’s Undergraduate Research Symposium
4. **\*W. J. Sagues**. 2022. “Findable, Accessible, Interoperable, and Reusable (FAIR) Data from the Stan Mayfield Demonstration Cellulosic Biorefinery”. Oral presentation at the

US Department of Energy's Bioenergy Technology Systems Development and Integration Office

5. **\*W. J. Sagues**. 2022. "Carbon Dioxide Removal via Engineered & Natural Biosystems". Oral presentation at the University of Florida's Biocomplexity Research Group's monthly seminar series
6. **W. J. Sagues**, H. Jameel, S. Park, D. L. Sanchez. 2022. "Integrating Biomass Carbon Removal & Storage (BiCRS) in Chemical Pulp Mills" Poster presentation at the Gordon Research Conference on Carbon Removal
7. **\*W. J. Sagues**. 2022. "A Carbon-Negative Bioeconomy". Oral presentation at NCSU Student Energy Club's monthly meeting
8. **\*W. J. Sagues**. 2022. "Opportunities for CO<sub>2</sub> Removal in the Pulping Industry" Oral presentation at the International Symposium on Wood, Fiber, and Pulping Chemistry (cancelled due to COVID reasons)
9. **\*W. J. Sagues**, T. Vook, V. Rondon, E. Woods, J. Cunniffe, & L. Lower. 2021. "Going Carbon Negative – An Opportunity for Agricultural & Biological Engineers" Oral presentation at the American Society of Agricultural & Biological Engineers Annual North Carolina State Section Meeting
10. T. Vook, P. Kolar, **W. J. Sagues**. 2021 "Statistical Optimization of Catalytic Graphitization of Paper Towel Waste" Oral presentation at the American Society of Agricultural & Biological Engineers Annual International Meeting
11. **\*W. J. Sagues**, J. Cunniffe, L. Lower, & J. Cheng. 2021 "Coupling Circularity with Negativity in Food & Agriculture Systems" Oral presentation at the American Society of Agricultural & Biological Engineers Member Hour
12. **W. J. Sagues**, M. Yung, H. Jameel, M. Davis, B. Donohoe, M. Nimlos, and S. Park. 2021. "Catalytic Graphitization of Biomass for Green Battery Anodes" Oral presentation at the Institute of Biological Engineering's Annual Conference
13. **W. J. Sagues**, H. Jameel, S. Park, D. L. Sanchez. 2021. "Integrating CO<sub>2</sub> Capture, Utilization, and Storage at Pulp & Paper Mills in the United States" Oral presentation at the Institute of Biological Engineering's Annual Conference
14. **\*W. J. Sagues** 2021 "The Grand Challenge of Carbon Sequestration" Oral presentation to the NCSU course E102: Engineering in the 21<sup>st</sup> Century
15. **\*W. J. Sagues** 2021 "Introduction to Biocarbon Utilization & Sequestration" Oral presentation for the Sustainable Materials & Technology program at NCSU
16. **\*W. J. Sagues** 2021 "Introduction to the Bioeconomy and Carbon Sequestration" Oral presentation to the Environmental Science program at North Carolina Central University
17. **\*W. J. Sagues** 2021 "Emerging Opportunities for Biological Carbon Sequestration" Oral presentation at the Consortium for Advanced Bioeconomy Leadership Education (CABLE) Annual Conference
18. **\*W. J. Sagues** 2021 "Carbon Sequestering Building Materials" Oral presentation at the workshop on Carbon Accounting in Land Development, hosted by Dr. Bill Hunt at NCSU
19. **\*W. J. Sagues** 2020. "Biocarbon Utilization & Sequestration" Oral presentation at Cotton Incorporated
20. **\*W. J. Sagues** 2020. "Integrating Carbon Capture, Utilization, & Sequestration into Pulp & Paper Mills" Oral presentation as Horizon Lecture Series Speaker at Kimberly-Clark

21. **\*W. J. Sagues** 2020. “Integrating Carbon Capture, Utilization, & Sequestration into Pulp & Paper Mills” Oral presentation at UC Berkeley & Carbon 180’s Conference on Bioenergy with Carbon Capture & Storage
22. **\*W. J. Sagues** 2020. “Scale-Up Data: A Hidden Asset” Oral presentation at the DOE Bioenergy Technology Office Data Workshop
23. **W. J. Sagues**, M. Yung, H. Jameel, M. Davis, B. Donohoe, M. Nimlos, and S. Park. 2020. “Catalytic Graphitization of Lignin for Green Battery Anodes” Oral presentation at the Society for Industrial Microbiology and Biotechnology’s Symposium on Biomaterials, Fuels, and Chemicals (*Cancelled due to COVID-19*)
24. **W. J. Sagues**, D. L. Sanchez, H. Jameel, and S. Park. 2020. “Integrating CO<sub>2</sub> Capture, Utilization, & Storage at Pulp & Paper Mills in the United States” Poster presentation at the Society for Industrial Microbiology and Biotechnology’s Symposium on Biomaterials, Fuels, and Chemicals (*Cancelled due to COVID-19*)
25. **W. J. Sagues**, M. Yung, H. Jameel, M. Davis, B. Donohoe, M. Nimlos, and S. Park. 2020. “Catalytic Graphitization of Biomass for Green Battery Anodes” Oral presentation at the Institute of Biological Engineering’s Annual Conference (*Cancelled due to COVID-19*)
26. **W. J. Sagues**, H. Jameel, S. Park, D. L. Sanchez. 2020. “Integrating CO<sub>2</sub> Capture, Utilization, and Storage at Pulp & Paper Mills in the United States” Oral presentation at the Institute of Biological Engineering’s Annual Conference (*Cancelled due to COVID-19*)
27. **W. J. Sagues**, H. Jameel, S. Park, D. L. Sanchez. 2019. “Enhanced Carbon Dioxide Removal from Coupled Direct Air Capture-Bioenergy Systems” Oral presentation at the Applied Energy Symposium at MIT
28. **W. J. Sagues**, H. Jameel, S. Park. 2019. “Catalytic Graphitization of Lignocellulosic Biomass” Oral presentation at the ACS Annual Green Chemistry & Engineering Conference
29. **W. J. Sagues**, K. McCance, S. L. McAlexander, M. Blanchard, R. Venditti. 2019. “An Interdisciplinary Educational Program to Promote Interest in the Circular Bioeconomy” Oral presentation at the ACS Annual Green Chemistry & Engineering Conference
30. **W. J. Sagues**, Z. Tong. 2017. “Production of Phenolic Monomers and Free Sugars from Sweet Sorghum Bagasse via Fenton Modification & Supercritical Ethanol” Oral presentation at the American Society of Agricultural & Biological Engineers’ Annual International Meeting
31. **W. J. Sagues**, Z. Tong. 2016. “Ironing out the kinks: A ferric catalyzed process for selective monomerization of lignin from whole biomass while leaving the cellulosic fraction in high purity” Oral presentation at the Technical Association of the Pulp and Paper Industry’s International Bioenergy and Bioproducts Conference
32. **W. J. Sagues**, Z. Tong. 2016. “Overcoming the blend wall: Ethanol as a green solvent for thermochemical conversion of whole biomass into high-value aromatics and purified cellulose” Oral presentation at the American Society of Agricultural & Biological Engineers’ Annual International Meeting
33. **W. J. Sagues**, Z. Tong. 2016. “Ironing out the kinks: A two-step ferric catalyzed process for monomeric aromatics and purified cellulose from whole biomass” Poster presentation

at the Society for Industrial Microbiology and Biotechnology's Symposium on  
Biotechnology for Fuels and Chemicals

34. **W. J. Sagues**, Z. Tong. 2016. "A two-step process for the conversion of sorghum bagasse into monomeric aromatics and purified cellulose" Oral presentation at the Florida Center for Renewable Chemicals & Fuels
35. **W. J. Sagues**, I.U. Nieves, L.O. Ingram. 2014. "Lignocellulosic biorefinery process development and scale-up in the State of Florida" Oral presentation at the American Society of Agricultural and Biological Engineers' Florida Section Annual Conference