

2024–2025 ACCOMPLISHMENTS



In Year 5, MASBio continued to strengthen the regional bioeconomy through cutting-edge research, education, and outreach. From mine reclamation to new biobased materials, MASBio partners delivered tangible impacts for communities, industry, and the environment.

-  **19**
Peer-reviewed papers published
-  **20**
Academic presentations
-  **3**
Stakeholder presentations
-  **18**
Students: 2 postdocs, 11 PhD, 5 MS students engaged
-  **28**
Outreach events (schools, academic, industry, community)

IMPACT AREAS

-  **Environmental:** Improved soils, carbon storage, and water quality through biochar and biomass research.
-  **Economic:** Commercial pilots validated pathways for carbon credits and rural enterprise development.
-  **Education:** Expanded student training and K-12 engagement in bioeconomy careers.
-  **Policy & Industry:** Strengthened links to carbon markets, sustainable aviation fuels, and supply chain innovation.
-  **Community impact:** workshops and field days in WV and OH shared practical biochar and soil health solutions.

HIGHLIGHTS

Breakthroughs in bioproducts

Adhesives outperforming soy, CO₂-to-nanomaterials, and high-density biochar pellets.

Large-scale pilots

In biochar asphalt, methane reduction, stormwater filtration, and urban forestry.

AI-powered models

Cut supply chain analysis time by 99%.

Patent

Method for converting carbon dioxide into carbonate nanomaterials using biological materials. US provisional patent application #63/754,686, Feb. 6, 2025.

Learn more from our latest Peer-Reviewed Publications:

1. Identification of land and potential production of willow biomass crops using a multi-criteria land suitability assessment.
<https://doi.org/10.3390/land13111831>

2. Yield and survival of 19 cultivars of willow crops over eight rotations.
<https://doi.org/10.3390/f15112041>

3. Optimization of combined hydrothermal and mechanical refining pretreatment of forest residue biomass for maximum sugar release during enzymatic hydrolysis.
<https://doi.org/10.3390/en17194929>

4. Operational characteristics and business perspectives of wood pellet producers and feedstock suppliers in the southeastern U.S.
<https://www.doi.org/10.13073/FPJ-D-25-00001>

5. Evaluation for Establishing a Monitoring System to Reach Sustainability in New York State's Bioeconomy.
<https://doi.org/10.3390/su162411191>

6. Assessing the post-harvest characteristics of pellet feedstock and conventional harvest sites in the southeastern U.S.
<https://doi.org/10.1007/s44391-025-00024-w>

7. Log truck transportation challenges and innovative solutions: evaluating the perspectives of truck drivers, logging business owners, and foresters..
<https://doi.org/10.1080/14942119.2023.2273123>

8. Capturing and converting CO₂ using amino acids as various commercially valuable nano-carbonates.
<https://doi.org/10.1016/j.seppur.2024.131207>

9. Amino acid-driven one-step process to transform CO₂ into barium carbonate nanoparticles.
DOI: 10.1021/acssuschemeng.4c10207

10. Post-harvest assessment of downed woody debris and nutrient distribution following conventional pulpwood and wood pellet feedstock harvests in the southeastern US.
<https://doi.org/10.1016/j.jenvman.2025.125719>

11. Growing Opportunities: Considering a Thriving Agroforestry Industry in Appalachia, USA.
<https://doi.org/10.59978/ar03020007>

12. DiGiacomo, P.M., M.C. Bolding, J.L. Conrad IV, H.L. Munro, and K.M. Woosnam. 2025. Assessing the post-harvest characteristics of pellet feedstock and conventional harvest sites in the southeastern U.S.
<https://doi.org/10.1007/s44391-025-00024-w>

13. Sustainable bioplastic products for building applications: recent trends and future opportunities-A systematic review.
<https://doi.org/10.1002/bbb.70005>

14. End-of-Life Climate Impacts of Polyhydroxyalkanoates in the United States: The Role of Feedstock Variability and Temporal Dynamics-A Systematic Review.
<https://doi.org/10.1016/j.polymdegradstab.2025.111500>

15. A machine learning model using the snapshot ensemble approach for soil respiration prediction in an experimental Oak forest.
<https://doi.org/10.1016/j.ecoinf.2024.102991>

16. Bright Spots, Challenges, and Key Factors Going Forward: Perceptions of Bioeconomy Stakeholders.
<https://doi.org/10.1016/j.bioeco.2024.100068>

17. A review of biomass-based adsorption for rare earth elements recovery. Journal of Rare Earths. <https://doi.org/10.1016/j.jre.2025.03.006>

18. Mobilizing mine lands for biobased decarbonization strategies. Biofuels, Bioproducts and Biorefining.
<https://doi.org/10.1002/bbb.2766>

19. Heating system and feed additive effects on foot pad quality, broiler performance, and immune status.
<https://doi.org/10.1016/j.japr.2025.100557>

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