

2022 North American Biochar & Bioenergy

“Decarbonizing our Economy”



CONFERENCE PROGRAM

AUGUST 8, 2022 (Pre-Conference Workshops)

AUGUST 9 - 10, 2022 (Conference)

AUGUST 11, 2022 (Post-Conference Field Trips)

Morgantown Marriott at Waterfront Place | Morgantown, WV USA



WELCOME!

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Dear Participants,

United States Biochar Initiative joins MASBio and West Virginia University in welcoming you to the 2022 North American Biochar & Bioenergy Conference. The biochar community has grown and matured since our first conference in 2009. We look forward to exchanging ideas with representatives from Europe, Africa, Asia, Oceania, and the Americas.

USBI is a not-for-profit organization promoting the production and use of biochar in North America. We promote biochar for sustainable food security, improved soil fertility, and environmental and climate resilience. Our vision is to leave a legacy of fertile soils and carbon sequestered by raising awareness of and increasing the utilization of biochar through collaboration with organizations involved in production, application, and research. We engage the scientific, agriculture, and biomass communities to use safe, stable, and sustainable biochar. We endeavor to learn, educate, inform, demonstrate, and develop markets, policy incentives, and quality standards. The USBI board of directors includes biochar producers, technology developers and suppliers, research, agricultural extension, policy and education. We are grateful for the support from our sponsors and our conference partners.

Thank you for attending. We look forward to a productive conference.

Kind regards,

A handwritten signature in blue ink that reads "Thomas R. Miles".

Tom Miles
Executive Director
U.S. Biochar Initiative

Dear Participants,

I am pleased to welcome you to the 2022 North American Biochar & Bioenergy Conference, West Virginia University, and Morgantown, West Virginia. I am grateful to all the guests and speakers from all over the country for coming and sharing your knowledge and valuable experience with us.

We are excited to co-host this event with USBI. The Mid-Atlantic Sustainable Biomass for Value-Added Products Consortium (MASBio) (led by West Virginia University and funded by the USDA National Institute of Food and Agriculture) is a regional consortium utilizing our abundant biomass resources for the prosperity and sustainability of the regional bioeconomy.

The Mid-Atlantic region contains 10 million acres of mined and marginal land available for energy crop development and produces more than 8 million dry tons of forest residues yearly. The MASBio, with its network of universities, businesses, and governmental organizations, is creating opportunities for a multi-feedstock biomass supply chain of blended residues and biomass crops. Biochar is a key component of these value-added bio-products and we are working with partners studying its benefits and potential applications in the region.

We are fortunate to have distinguished guests and speakers who will speak with us during workshops and technical sessions about the future of value-added bioproducts and its role in decarbonizing our economy. We will also hear from many dedicated researchers, entrepreneurs, and policy makers about their work advancing and promoting this field.

I thank you for accepting the invitation and attending the conference. We are happy to have a group of sponsors with whom we will interact at the conference. I thank our industry partners and the MASBio team members for your efforts to bridge the gaps in R&D, industrial applications, and policy practices in biomass utilization for biochar and bioenergy. We appreciate and acknowledge the funding support from the USDA National Institute of Food and Agriculture, the WVU Research Office and Dr. Fred King, the WVU Research Office Sustainability/Carbon Management Initiative, and the WVU Division of Forestry and Natural Resources. We also thank the WVU Davis College and West Virginia Research Corporation. Last but not least, I thank the MASBio Advisory Board, Leadership Team, our students, and the dedicated efforts of Ms. Ashlea Stover of the WVU Research Office and the MASBio Manager, Ms. Molly Ramsey for their coordination with our USBI friends to put the program together and make the conference possible.

The agenda of the conference includes a series of workshops, oral and poster presentations, and field trips. I believe you can take away many different things this week from the conference. It will be an exciting event where academic frontiers and industry dynamics will interact, and the communications will take our research and collaboration to a higher level. I hope you all have an enjoyable, rewarding, and meaningful time in Morgantown, West Virginia. Thank you!

Sincerely,



Jingxin Wang, Benedum Distinguished Scholar
Davis Michael Professor of Forestry and Natural Resources
Director of Center for Sustainable Biomaterials & Bioenergy
Director of the Mid-Atlantic Sustainable Biomass for Value-Added Products Consortium
West Virginia University
Morgantown, West Virginia

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A wide-angle photograph of a lush green field under a blue sky with light clouds, serving as the background for the VOW section.

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SPEAKERS

MAIN SESSION

Tuesday, August 9, 2022 1:00- 1:30 PM

**PLENARY SPEAKER
KEN SWICK**

Assistant Director for the Wood, Fibers and Composites Research (WFCR) Division

Ken Zwick joined the Forest Products Laboratory (FPL) in 2021 as Assistant Director for the Wood, Fibers and Composites Research (WFCR) Division. WFCR explores ways to efficiently break wood down into smaller parts, and then transform those parts into higher value products. Ken joined the FPL after 22 year at Kimberly Clark Corporation where he most recently led product technology strategy for the tissue and towel business. Ken holds over forty US utility patents in tissue mechanics, structures, absorbency, and drying, as well as several patents in gasoline fuel injection. He holds a BA and BSME from the University of Michigan, and an MSE and PhD from the University of Pennsylvania.



Tuesday, August 9, 2022 1:30-2:00 PM

**PLENARY SPEAKER
Dominique Lueckenhoff**
Sr. VP, Hugo Neu

Dominique Lueckenhoff serves as the Senior Vice President for Corporate Affairs, EHS & Sustainability at Hugo Neu Corporation. Reporting to the Chair and CEO, she leads the company's global efforts in corporate sustainability, climate resiliency, environment, health and safety compliance, practices and policy, public and community affairs, and green business growth and investment. Ms. Lueckenhoff also manages Hugo Neu's support and partnership with a variety of public, private, non-profit organizations, and academic institutions, including the Stevens Institute of Technology's Environmental Engineering Sustainability Management Program, supporting the Hugo Neu Sustainability Seminar Series. Beyond her immediate corporate responsibilities, she serves as a Senior Fellow for the U.S. Water Alliance, an Associate Professor of Practice on the faculty of Virginia Tech's Center for Leadership in Global Sustainability, and chairs the National Municipal Stormwater Association's (NMSA) Community-Based Public Private Partnerships (CBP3) Center of Excellence for Water, Energy and Equitable Economic Resilience. Lueckenhoff also serves on the Board of Cousteau's Earth Echo International NGO, participates on the Water Steering Committee of the American Sustainable Business Council Network and is an Environmental Justice Advisor for the climate focused Carbon180 NGO. Her entrepreneurial drive for climate-smart solutions has also led to the recent business launch of EcoChar Environmental Solutions, employing decarbonization technologies and scientifically tailored biochars for cost-effective treatment and remediation of contaminated soil and water. Additionally Lueckenhoff is a member of Chief, a national network focused on connecting and supporting exemplary women executive leaders.



SPEAKERS

MAIN SESSION

Wednesday, August 10, 2022 12:30-1:30 PM

PLENARY SPEAKER

Benjamin "Benji" Baker,

Founder & President, American Conservation Coalition



Benji Backer is the founder and president of the American Conservation Coalition, the largest market-based youth environmental organization. Before he founded ACC at the University of Washington, Backer began his career in conservative politics well before he could vote — volunteering for campaigns in his home state of Wisconsin. He has represented a right-of-center environmental viewpoint nationally, including testifying among youth climate activists like Greta Thunberg in Congress. He has been named to the Fortune 40 Under 40, Forbes 30 Under 30, GreenBiz 30 Under 30, and Grist 50. ABC News called him one of “5 youth climate activists you need to know.” A frequent contributor to multiple national media outlets, Backer is a board member for BridgeUSA, the Wisconsin Conservative Energy Forum, and the Mainstream Republicans of Washington. He also serves on the American Academy of Arts & Sciences’ Climate Change Commission. In his free time, Benji enjoys anything related to the beautiful outdoors and/or Wisconsin’s sports teams.

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KEYNOTE



Jordan Solomon

Ecostrat

Biomass Feedstock Advisory and Supply

August 10, 2022 02:15 pm - 03:00 pm



Fred King

Professor, Vice President for West Virginia University Research

August 09, 2022 09:00 am - 10:40 am

SPEAKERS



Darrell Donahue

Dean of WVU Davis College of Agriculture, Natural Resources and Design Director of the West Virginia Agriculture and Forestry Experiment Station

August 09, 2022 09:00 am - 10:40 am



Thomas Foust

Catalytic Carbon Transformation & Scale-Up National Bioenergy Center Director, National Renewable Energy Laboratory

August 09, 2022 09:00 am - 10:40 am



Tom Miles

Executive Director of U.S. Biochar Initiative and President of T.R. Miles, Technical Consultants

August 09, 2022 09:00 am - 10:40 am



Jingxin Wang

Professor, Project Director of the Mid-Atlantic Sustainable Biomass Consortium (USDA NIFA) and the Director of the Center for Sustainable Biomaterials & Bioenergy (WVU)

August 09, 2022 09:00 am - 10:40 am



William Goldner

USDA Office of Chief Scientist

August 09, 2022 01:00 pm - 02:00 pm



Christopher Tindal

Commercial Aviation Alternative Fuels Initiative (CAAFI) Assistant Director

August 10, 2022 02:15 pm - 03:00 pm

MORGANTOWN, WV

Welcome to the heart of Mountaineer Country! Morgantown, WV is the perfect mix of college spirit and small-town traditions. Each restaurant, diner, and family has their own version of the treasured pepperoni-roll, and everyone has attended a West Virginia University football game.

Located at the intersection of Interstate 79 and Interstate 68, Morgantown is the perfect weekend-trip destination. Take a tour through local wineries and craft beer pubs, or fly into Morgantown Municipal Airport for quick access to shopping in Downtown Morgantown. Grab a paddle and float down the Monongahela River as it cuts through town, or stick to the shore as you bike along the Rail Trail.

As the home of West Virginia University (WVU), Morgantown is the home of thousands of students ten months out of the year. As a research university, WVU offers bachelor's, master's, doctoral and professional degrees, as well as leading programs in law and medicine. West Virginia University is also home of the Mountaineers and Mountaineer football, a team that dominates the field, causing the iconic "Let's Go! Mountaineers" chant to echo through the town on game day.

Life is always moving in Morgantown, with live-events, marathons, festivals, and more happening throughout the year. Local love for the arts has grown into artisan markets, high-production theatre performances, social art projects, and city-beautification through painted murals and sculpture. Many residents wonder how they will leave their mark on Morgantown, without even realizing the mark that it will leave on them.

For more information about Morgantown and to browse places to eat, shop, and play, head to the Visit Mountaineer Country Convention and Visitors' Bureau at <https://www.visitmountaineercountry.com/>.



CONFERENCE APP

USBI Biochar 2022 that's available in the Apple App Store and the Google Play Store. The app will let you build your own schedule, reach out to exhibitors and sponsors, read the full abstracts for each session, ask questions to our keynote speakers and interact with other attendees. Download it by searching Biochar 2022 in your phone's app store and look for an email from conference organizers.

<https://whova.com/pages/whova-app-user-guide/?source=ems>



ON MOBILE APP

1. Enter the email address you used for event registration.
To automatically log in to your event, please make sure to use the email you used when registering for the event.
2. Create a password and type in your name.
3. Edit your profile. Other attendees will use this to network with you. So make it look nice.
4. The app will take you to your event page automatically.
5. If your event doesn't show up automatically, search for it. Then, click the join button on the bottom of the event description page, and enter the event invitation code the organizers sent you.



ON WEB PORTAL

If your event has live streaming for sessions, we suggest that you use Chrome browser for the web portal. Some streaming software may have compatibility issues with other browsers.

1. Get the web portal link for your event from the event organizer and open the page. The link looks like "https://whova.com/portal/webapp/xxxx/"
2. Click "Sign up here" if you don't have an account yet, and fill in your email and password.
To automatically log in to your event, please make sure to use the email you used when registering for the event. Otherwise you need to input the event invitation code.
3. The app will automatically take you to the event main page.

Note that if you are not using the registered email, you will be prompted to enter the event invitation code. Please request the code from your event organizers.

ATTENDEE INFORMATION

CONFERENCE FACILITY

The Morgantown Marriott at Waterfront Place is a brand new, beautiful, full-service Wharf District hotel overlooks the picturesque Monongahela River and boasts 207 well-appointed guest rooms and suites. We offer an abundance of amenities, including luxurious bedding, free high speed WiFi, a beautiful indoor pool, state-of-the-art fitness center, concierge lounge, room service, flat screen HDTVs, and more. The hotel features a full service Starbucks, signature restaurant (Bourbon Prime), and an incredible location near downtown Morgantown, WVU, golf courses, local wineries and other area attractions.

With over 50,000 square feet of modern, flexible meeting and event space, the Waterfront Place is the perfect destination to host the Biochar 2022 conference and workshops. The facility is the recent recipient of Convention South Readers Choice Award Winner 2019 ("Best meeting site in the South").

VISIT <https://www.marriott.com/en-us/hotels/mgwmc-morgantown-marriott-at-waterfront-place/overview/>

PUBLIC WIFI

The conference site will provide attendees with wifi throughout the facility. We would like to make a note that public wifi is not fully secure and thus we would advise that you do not transmit sensitive information such as banking information or sensitive documents over any public wifi connection.

PRESENTERS

All presenters should check in at our registration desk to ensure we have a copy of your presentation. We will direct you to the Speaker Room, where a meeting volunteer will save a copy of your presentation on a shared google drive and an external hard drive.

If you are presenting a poster, we will direct you to the poster session room with easels and tacks for hanging your poster. All posters must be hung before lunch on Tuesday, August 9th.

SOCIAL MEDIA

If you post about the conference please be sure to use the hashtag #Biochar2022

COVID PROTOCOLS

- Everyone who has registered for the North American Biochar & Bioenergy Conference (Biochar 2022) has pledged that they will either be fully vaccinated for COVID-19 or test negative within 72 hours prior to the event.
- Hotel and conference staff are all fully vaccinated
- The conference will be following the federal, state and WVU protocols for COVID-19 safety. At this time, masks are no longer required indoors (except on mobile seminar transportation and mobile seminar tour stops where required); however, this may change at anytime prior to the event.
- The conference will have a limited quantity of KN95 and KF94 masks available at the registration desk if you forget to bring yours. **If you are more comfortable wearing a mask, we encourage you to do so. As of this time, we recommend wearing of masks.**
- Enhanced cleaning procedures continue throughout the hotel and conference center, with additional sanitizing stations set up in classrooms.

At Biochar 2022, we will provide COVID-19 safety measures such as offering the choice of a colored stickers on lanyards to indicate individual comfort level during the event:

- **GREEN** = comfortable with handshakes/close contact
- **YELLOW** = fist/elbow bumps only
- **RED** = No contact/distance appreciated

BIOCHAR 2022 CONFERENCE CONTACT

If you should have any questions, comments or concerns please email info@biochar2022.com

PARKING Parking is available via the conference facilities two parking garages on either end of the facility.

SCHEDULE

MONDAY - 8/8/2022

TRACK	Workshop #1 - Biochar Industry Association/Standards & Certification	Workshop #2 - Biomass & Biochar Stakeholder Focus & Engagement	Workshop #3 - Life Cycle Assessment for Biochar Facilities & Carbon Markets	Workshop #4 - Biochar Practitioners Workshop: Biomass Chars, Production, Practices and Outcomes from Two Perspectives	Conference Registration Services
LOCATION	UL, Platinum Grand Salon D	UL, Platinum Grand Salon E	UL, Platinum Grand Salon D	UL, Platinum Grand Salon E	
MODERATOR	Tom Miles	Shawn Gruschecky & Dave McGill	Link Shumaker, PE & Chandni Joshi-Jangid, PhD	Norm Baker & Mike Flynn	
7:30 AM - 5:00 PM					Conference Registration and Setup Activities (7:30 AM - 5:00 PM)
8:30 AM - 12:00 PM	In Session	In Session			
10:00 AM - 10:15 AM	Workshop Break	Workshop Break			
12:00 PM - 1:30 PM	Lunch On Own	Lunch On Own	Lunch On Own	Lunch On Own	Exhibitor Load-In (12:00 PM - 5:00 PM)
1:30 PM - 5:00 PM			In Session	In Session	
3:00 PM - 3:15 PM			Workshop Break	Workshop Break	
3:15 PM +	Free Time Dinner On Own	Free Time Dinner On Own	Free Time Dinner On Own	Free Time Dinner On Own	

NOTES

TUESDAY - 8/9/2022

SCHEDULE

7:00 AM - 9:00 AM	LL, MECA	CONFERENCE ATTENDEES BREAKFAST
7:00 AM - 8:30 AM	UL, Mon River A	MASBio Focus Groups (By invitation only)
9:00 AM - 10:40 AM		WELCOME & INTRODUCTION - TOM MILES & JINGXIN WANG
9:10 AM - 9:20 AM		DR. FRED KING: Welcome Address
9:20 AM - 9:30 AM		DR. DARRELL DONAHUE: Welcome Address
9:30 AM - 9:50 AM	LL, MECA	JINGXIN WANG: "MASBio Accomplishments, Impacts, and Engagement"
9:50 AM - 10:15 AM		KEYNOTE #1 - TOM FOUST: "The future of biofuels and bioproducts towards achieving carbon neutrality by 2050"
10:15 AM - 10:40 AM		KEYNOTE #2 - TOM MILES (USBI): "Decarbonizing our Circular Economy with Biochar"
10:40 AM - 11:00 AM	LL, MEC B	CONFERENCE BREAK/VENDOR HALL
11:00 AM - 12:15 PM	UL, Platinum Grand	TECHNICAL SESSIONS 1A-5A
12:15 PM - 1:00 PM		LUNCH & TOPIC TABLES
1:00 PM - 2:00 PM		PLENARY SPEAKERS
1:00 PM - 1:30 PM	LL, MECA	DR. KENNETH ZWICK – "Making a Sustainable Future with Forest Products"
1:30 PM - 2:00 PM		MS. DOMINIQUE LUECKENHOFF – "Scaling the Power of Biochar: the '360' Solution for a Healthy, Sustainable & Resilient World"
2:00 PM - 2:20 PM	LL, MEC B	CONFERENCE BREAK
2:20 PM - 4:25 PM	UL, Platinum Grand	TECHNICAL SESSIONS 1B-5B
4:45 PM - 5:30 PM	UL, Waterfront and Mon River A	MASBio Task Group Collaboration Meeting (By invitation only)
4:25 PM - 4:45 PM		CONFERENCE BREAK
4:45 PM - 7:30 PM	LL, MEC B	POSTER SESSION and SOCIAL EVENT
7:30 PM - 9:00 PM	UL, Waterfront	MASBio Student Career Panel Discussion (Private)
7:30 PM - 11:00 PM		DINNER ON YOUR OWN - TOPIC PUB HOP

SCHEDULE

TUESDAY MORNING - TECHNICAL SESSIONS

BIOCHAR PRODUCTION & COMMERCIALIZATION SESSION #1A Biochar Production - Part 1	BIOENERGY & OTHER VALUE-ADDED PRODUCTS SESSION #2A	CARBON MARKETS & CIRCULAR ECONOMIES SESSION #3A	ENVIRONMENTAL RESTORTION & REMEDIATION SESSION #4A	CLIMATE SMART AGRICULTURE & FORESTRY SESSION #5A
UL, Platinum Grand Salon FGH Tom Miles	UL, Platinum Grand Salon E Bill Goldner	UL, Platinum Grand Salon D Kathleen Draper	UL, Platinum Grand Salon ABC Jeff Waldon	UL, Wharf AB Albert Bates
#38, Challenges of a biochar startup, Bob Wells	#72, MASBIO: Energizing the MidAtlantic Bioeconomy, Shawn Grushecky	#100, The Carbon Market EcoSystem, Caitlin Kelly, South Pole	#50, Enhancement of Infiltration and Vegetation Growth in Compacted Urban Soil with Biochar Amendment, Derya Akpinar, Paul Imhoff	#19, Biochar impacts on soil quality in arid sandy loam soil after four years, Catherine Brewer, Mohammed Omer, O. John Idowu, April Ulery
#82, Demonstration of a new biochar production technology (International Biorefineries), Raj Kathuria	#52, MASBio Task 2: Developing the Next Generation of Multi-feedstock Biomass Supply Chains to Advance the Bioeconomy, Nathaniel Anderson, Jingxin Wang, Chad Bolding et al.	#101 Life Cycle Assessments for Biochar Facilities and Carbon Markets, Link Shumaker	#11, Evaluation of Wood-Waste Biochar and Iron-Mining Byproduct for Simultaneous Pollutant Removal from Urban Runoff, Tadele Haile, Matthew Young, Bridget Ulrich	#81, Switchgrass and Giant Miscanthus Biomass Production on Reclaimed Mine Lands, Jeff Skousen
#55, Large Scale Co-Production of Biochar and Bioenergy using ICM's Model-300 Gasifiers, Bert Bennett	#77, MASBio Task 3: Sustainable Biomass for Value-Added Biomass Products, Jianli Hu	#31, The Carbon Removal Market: bottlenecks and opportunities, Matt Wilson Plasek	#54, The Impact of a Wood Biochar on Typical Roadside Soil, Turfgrass, and Stormwater Hydrology, Marcus Bowser, Paul Imhoff, Erik Ervin, Mikayla Rypkema, Andrew Blackburn	#4, Biochar from Sugarcane Harvesting and Processing Waste Products Improves Sugarcane Ratooning Ability, Isabel Lima, Paul White

NOTES

SCHEDULE

TUESDAY AFTERNOON - TECHNICAL SESSIONS

BIOCHAR PRODUCTION & COMMERCIALIZATION SESSION #1B Product Development & Marketing	BIOENERGY & OTHER VALUE-ADDED PRODUCTS SESSION #2B	CARBON MARKETS & CIRCULAR ECONOMIES SESSION #3B	ENVIRONMENTAL RESTORATION & REMEDIATION SESSION #4B	CLIMATE SMART AGRICULTURE & FORESTRY SESSION #5B
UL, Platinum Grand Salon FGH Isabel Lima	UL, Platinum Grand Salon E Tim Volk	UL, Platinum Grand Salon D Kathleen Draper	UL, Platinum Grand Salon ABC Heather Kingery	UL, Wharf AB Nate Anderson
#41, Biochar Analyses and Certification- Making Sense of the Data, Akio Enders	#43, Characterize the fundamental properties of various-year-harvested logging residues and strategize their potential applications in the eastern United States, Wanhe Hu	#20, Carbon Dioxide Removal (CDR) Technology - Driving NetZero and the Circular Economy, Robert Kovach	#74, Early results of biochar amendments in biomass plantings in the mid-Atlantic region, Jamie Schuler, Zac Freedman, Shawn Grushecky, Jeff Skousen	#80, MASBio System Scale-up Analysis: Artificial Intelligence (AI) Tools, Richard Bergman, Xin Li, Debangsu Bhattacharyya, Tristian Brown, Poulomi Das, Kamalakanta Sahoo, Seyed Hashem Mousavi Avval, Jayendra Ahire
#47, Engineering functional biochars for specific applications, Eric Singasaas	#40, A Systematic Visualization Assessment of Research Focused on Biomass to Bioenergy Supply Chain Design, Md Abu Helal, Nathaniel Anderson, Yu Wei, Matthew Thompson	#33, Pricing of removals in the voluntary carbon markets, Matt Wilson Plasek	#70, Use of biochar and biochar & compost blends as a soil amendment in stream restoration tree plantings, Shawn Grushecky, Jamie Schuler	#15, Data Science Applications in Resource Recovery and Carbon Capture: A Critical Literature Review and Future Research Direction, Mohammed Zaki, Tamim Orner, Kevin Rowles, Lewis Stetson
#66, A new approach for complete pore size distributions and regime-specific total pore volume determinations of biochars, Brian Barry	#64, A conceptual framework of inventory control models to study biomass facility supply chain management and enhance supply chain resilience, Yu Wei, Md Abu Helal, Nathaniel Anderson, Matthew Thompson	#21, Opportunities and barriers in the biochar carbon market, Melissa Leung	#57, Sustainability of bioenergy crop production with biochar on reclaimed mine and marginal agricultural lands, Charlene Kelly, Zachary Freedman, Salvador Grover	#75, Analysis of Biomass Sustainability Indicators from a Machine Learning Perspective, Syeda Nyma Ferdous, Xin Li, Kamalakanta Sahoo, Richard Bergman
#65, Biochar: Understandable Messages for the Masses, Wendy Lu McGill	#93, A stochastic techno-economic analysis of forest biomass feedstock supply chains: clean and dirty chips for bioenergy applications, Haksoo Ha	#84, Experiences from creating a standard for carbon sinks with biochar, Cecilia Hermansson	#39, Removal of heavy metal ions using surface-modified logging residue hydrochar, Wanhe Hu, Jingxin Wang, Nan Nan	#79, Environmental and Social Sustainability Analysis of Biomass-Based Processes, Debangsu Bhattacharyya
#69, Taxonomy & Market Development, Shaun Scallan	#78, Innovative cycling reaction mechanisms of CO2 absorption in amino acid salt solvents, Zhenghong Boa	#106, Monetizing Negative Emissions in the Voluntary Carbon Market: An Introduction to Puro.Earth for Biochar Producers, Joseph Kochanski	#68, Metal adsorption on novel biochar produced from waste plant materials generated in the essential oil industry, Sameer Neve, Dibyendu Sarkar, Zhiming Zhang, Rupali Datta	#102, Improving the Environment and Economics at the Same Time, Michael McGolden

SCHEDULE

WEDNESDAY - 8/10/2022

7:00 AM - 8:30 AM	UL, Mon River A	MASBio Focus Groups (By invitation only)
7:00 AM - 8:30 AM	LL, MEC A	CONFERENCE ATTENDEES BREAKFAST
8:30 AM - 10:10 AM	UL, Salon A - H	TECHNICAL SESSIONS 1C-5C
10:10 AM - 10:20 AM	LL, MEC B	CONFERENCE BREAK/VENDOR HALL
10:20 AM - 12:00 PM	UL, Salon A - H	TECHNICAL SESSIONS 1D-4D
12:00 PM - 1:30 PM		LUNCH & TOPIC TABLES
12:30 PM - 1:30 PM		PLENARY PRESENTATION - MR. BENJAMIN 'BENJI' BACKER
1:30 PM - 1:45 PM		KEYNOTE SPEAKER Q&A
1:45 PM - 2:15 PM		CONFERENCE BREAK/VENDOR HALL
2:15 PM - 2:30 PM	LL, MEC A	PRESENTER: JORDAN SOLOMON, ECOSTRAT: "The BDO Zone Initiative - Accelerating biomass-based manufacturing and clean energy economic development"
2:45 PM - 3:00 PM		PRESENTER: CHRIS TINDAL, CAAFI: "Current Status of SAF Development and Deployment"
3:00 PM - 4:00 PM		TECHNICAL PANEL DISCUSSION: "Constraints and Opportunities In Moving Biochar and Bioenergy Forward To Decarbonize Our Economy"
4:00 PM - 4:30 PM		CONFERENCE CLOSING
5:00 PM - 6:30 PM	UL, Waterfront	MASBio Member Session: YR2 Highlights, Project Evaluation, & YR3 Planning (By invitation only)
6:00 PM - 8:00 PM	UL, Mon River A	USBI BOD Meeting & Dinner (Private)
6:30 PM - 7:30 PM	Marriott Bourbon Prime Restaurant	MASBio Advisory Board/Leadership Team Meeting (By invitation only)
6:30 PM - 7:30 PM		DINNER ON YOUR OWN

SCHEDULE

WEDNESDAY MORNING - TECHNICAL SESSIONS

BIOCHAR PRODUCTION & COMMERCIALIZATION SESSION #1C	BIOENERGY & OTHER VALUE-ADDED PRODUCTS SESSION #2C	CARBON MARKETS & CIRCULAR ECONOMIES SESSION #3C	ENVIRONMENTAL RESTORATION & REMEDIATION SESSION #4C	CLIMATE SMART AGRICULTURE & FORESTRY SESSION #5C
<p>Products, Quality & Standards</p> <p>UL, Wharf AB</p> <p>Kim Chaffee</p>	<p>UL, Platinum Grand Salon E</p> <p>Jingxin Wang</p>	<p>UL, Platinum Grand Salon D</p> <p>Kathleen Draper</p>	<p>UL, Platinum Grand Salon ABC</p> <p>Dave McGill</p>	<p>UL, Platinum Grand Salon FGH</p> <p>Wendy Lu</p>
<p>#9, Broadening biochar usage: Product Form for industrial and agricultural applications, John Resse, Al Metauro</p>	<p>#18, Comparative assessment of biochar materials produced from common organic waste feedstocks at laboratory and commercial scales, Yvan Hernandez-Charpak, Madan Manipati, Carlos Diaz, Thomas Trabold</p>	<p>#89, Challenges & Opportunities for Scaling Biochar Industry Expansion, R. Kempner, T. Miles</p>	<p>#42, Biochar and PFAS, Akio Enders</p>	<p>#103, The NRCS Soil Carbon Amendment Practice, Brandon Smith</p>
<p>#29, Review of R&D activities at TAC-Biochar (Quebec, Canada), Maude Graham Sauve, Marianne Lapointe, Regis Pilote</p>	<p>#14, Multi-scale life cycle assessment of co-producing biochar and value-added wood products from diverse forest resources, Yuan Yao</p>	<p>#90, Introducing the Biochar Market Catalyst, R. Kempner, K. Draper</p>	<p>#51, Biochar Use in Nature Based Wastewater Applications, Paul Sturm, Phal Mantha</p>	
<p>#83, Estimating the Lime Equivalence of Biochar for Quality Assessment, Mingxin Guo</p>	<p>#16, High Temperature Pyrolysis for Co-Product Generation: Renewable Energy & Biocarbon, Andrew White</p>	<p>#109, Using Agricultural Feedstocks to Address Environmental Challenges with Market-Driven Solutions, Lauren Hershey</p>	<p>#45, Biochar Applications in Water filtration, Bryan Eagle</p>	
<p>#6, Modified Atmosphere Bulk Packaging: Principles and Practice of Biochar Storage and Transport, Thomas Nelson</p>	<p>#17, Biochar composites for sustainable thermal packaging applications, Madan Manipati, Carlos Diaz, Kathleen Draper, Thomas Trabold</p>	<p>#37, Dwelling on Drawdown - how to maximize the use of biochar in the built environment, Kathleen Draper</p>	<p>#56, Use of Biochar in Live Streams and Lakes on Mine, Municipal and Private Lands, James Barber</p>	<p>#104, Biochar for Soil Health: Working with the USDA-NRCS on Biochar, Chad Cochrane</p>

NOTES

SCHEDULE

WEDNESDAY AFTERNOON - TECHNICAL SESSIONS

BIOCHAR PRODUCTION & COMMERCIALIZATION SESSION #1D Biochar Production - Part 2	BIOENERGY & OTHER VALUE ADDED PRODUCTS SESSION #2D	CARBON MARKETS & CIRCULAR ECONOMIES SESSION #3D	ENVIRONMENTAL RESTORATION & REMEDIATION SESSION #4D	CLIMATE SMART AGRICULTURE & FORESTRY SESSION #5D
UL, Platinum Grand Salon FGH Akio Enders	UL, Platinum Grand Salon E Jamie Schuler	UL, Platinum Grand Salon D Kathleen Draper	UL Platinum Grand Salon ABC Charles Hegberg	UL Wharf AB Shawn Grushecky
#34, Equipment Improvements and Process Optimization for Large Scale Production of Biochar, Matthew Kieffer	#64, Switchgrass field harvesting data collection for modeling the biomass supply chains, Jude Liu, Hana Toth, Daniel Ciolkosz, Jingxin Wang	#88, Producing Biochar from Human Excreta and other High Moisture Feedstocks, Jeff Hallowell	#96, Biochar development in Urban Landscapes: Bloomberg Towns - Cincinnati, OH, Lincoln, NE, Minneapolis, MN (Panel Discussion)	#22, Riding on the back of pollinators, David McGill
#48, Biochar Production from Distillery Stillage in Kentucky (Jack Daniels Barrels, IBI Certified), J. Thomas	#44, A conceptual framework of inventory control models to study biomass facility supply chain management and enhance supply chain resilience, Yu Wei	#98, Offsetting the Carbon Intensity of Oil and Gas Operations, Mark Mersman		#13, Rice Residue Biochar Transfigures Carbon Footprint under Rice-Wheat System of Indian Indo-Gangetic Plains, Shiv Vendra
#61, American GreenFuels Rockwood - New Biochar Production Facility, Sean McAndrew, David Astrauckas	#27, Conversion of Carbon Dioxide into Nanomaterials using Amino Acids, Bingyun Li	#107, Food, Materials and Energy Regenerative, Better and Cheaper - for All, John Miedema	#91, Advancing biochar use to achieve the Chesapeake Bay water quality goals & climate resiliency (Round Table Discussion), Chuck Hegberg	#7, Low-Cost Timber Stand Improvement (TSI) via RoCC kilns, Biochar and Carbon Markets, Paul Anderson, Gary Gilmore
#49, Repurposing an Activated Carbon Factory in Hawaii for Biochar Production (\$50 million idled plant), Jon Maurer	#46, Aldehyde Free Bio-adhesive Prepared from Soy Protein Isolate and Partially Degraded Lignin, Changle Jiang	#73, Educating Future Producers and Users of Biochar in the Mid Atlantic, Amir Hass, Shawn Grushecky, et al.		#62, Survey of biomass residues and their potential for bio- carbon sequestration in Canada, Murlidhar Gupta, James Adams, Fernando Preto

NOTES

SCHEDULE

THURSDAY - 8/11/2022

TRACK	Field Trip #1A - Biomass Field Trials (Morning)	Field Trip #2A - CharBoss Demonstration (Morning)	Field Trip #1B - Biomass Field Trials (Afternoon)	Field Trip #2B - CharBoss Demonstration (Afternoon)	Conference Registration Services
LOCATION	Local trial sites	WVU Research Forest	Local trial sites	WVU Research Forest	Transportation from Hotel to Airport 7:30 AM-7:30 PM
MODERATOR	Shawn Grushecky	James Archuleta USFS, Jamie Schuler	Shawn Grushecky	Charles Becker USFS, Jamie Schuler	
8:30 AM - 12:00 PM	In Session	In Session			
12:00 PM - 1:00 PM	Box Lunch Provided	Box Lunch Provided	Box Lunch Provided	Box Lunch Provided	
1:00 PM - 5:00 PM			In Session	In Session	

NOTES

FIELD TRIP INFORMATION

FIELD TRIP 1 – BIOMASS FIELD TRIALS

THURSDAY, AUGUST 11, 2022

Times	Description
08:30 am – 12:00 pm	Field Trip A – Biomass Field Trials (Morning)
01:00 pm – 05:00 pm	Field Trip A – Biomass Field Trials (Afternoon)

** Please wear closed toe shoes and wear a mask on the van/bus to the site.*

TOUR INFORMATION:

Participants of this field trip will visit marginal agricultural, surface mine sites, and stream restorations that have been used as field trials for the MASBio project. These trials are designed to demonstrate feasible and cost-effective approaches to soil amendments, including biochar, for biomass plantings in the Mid-Atlantic region. This field trip will showcase hybrid willow and switchgrass plantings on agricultural and mined soils as well as miscanthus and other biomass crops. The tour will also visit a stream restoration project that included biochar amendments with hardwood tree seedlings in the revegetation work. This tour requires some light walking as well as approximately 1 hour of total travel time in supplied vans.

MASBio is led by West Virginia University and supported by the Agriculture and Food Research Initiative Competitive Grant No. 2020-68012-31881 from the USDA National Institute of Food and Agriculture.



AMENDMENT STUDY TREATMENTS 2021																		
PLOT	AGRONOMY FARM			JACKSON'S MILL FARM			REEDSVILLE FARM			LP MINE			ALLSTAR MINE1			ALLSTAR MINE2		
	CROP	Survival	TRT	CROP	Survival	TRT	CROP	Survival	TRT	CROP	Survival	TRT	CROP	Survival	TRT	CROP	Survival	TRT
1	W		F	W	85	B	S		C	S	ok	C	W	0	F	W	83	F
2	W		B	W	90	F	S		F	S	ok	B	W	75	C	W	83	B
3	W		C	W	83	C	S		B	S	ok	F	W	60	B	W	83	C
4	S	poor	B	S	ok	F	W		F	W		C	S	ok	C	S	ok	B
5	S	poor	F	S	ok	B	W		B	W		B	S	ok	B	S	ok	F
6	S	poor	C	S	ok	C	W		C	W		F	S	ok	F	S	locust	C
7	W		B	S	ok	B	S		B	W		B	W	82.5	B	W	84	C
8	W		C	S	ok	C	S		F	W		C	W	97.5	C	W	60	B
9	W		F	S	ok	F	S		C	W		F	W	100	F	W	70	F
10	S	poor	F	W	90	F	W		B	S	ok	F	S	ok	F	S	ok	B
11	S	poor	B	W	84	C	W		F	S	ok	B	S	ok	C	S	ok	F
12	S	poor	C	W	84	B	W		C	S	ok	C	S	ok	B	S	ok	C
13	S	poor	C	S	mod	B	W		F	S	ok	C	W	78	B	S	ok	C
14	S	poor	F	S	ok	F	W		B	S	ok	B	W	66	F	S	ok	F
15	S	poor	B	S	ok	C	W		C	S	ok	F	W	47	C	S	ok	B
16	W		B	W	100	B	S		C	W		F	S	poor	F	W	87	B
17	W		F	W	90	F	S		F	W		B	S	poor	B	W	70	C
18	W		C	W	67	C	S		B	W		C	S	poor	C	W	48	F
19	S	poor	F	W	80	F	W		F	S	ok	C	W	70	B			
20	S	poor	C	W	83	B	W		C	S	ok	F	W	58	C			
21	S	poor	B	W	73	C	W		B	S	ok	B	W	0	F			
22	W		C	S	ok	C	S		B	W		B	S	poor	C			
23	W		B	S	ok	F	S		F	W		F	S	poor	B			
24	W		F	S	ok	B	S		C	W		C	S	poor	F			
avg. growth willows	2-3ft			2-6ft			2-6ft			<1ft			<1ft			<1ft		

For more information, please contact: Dr. Shawn Grushecky Shawn.Grushecky@mail.wvu.edu; Dr. Jamie Schuler jamie.schuler@mail.wvu.edu.

FIELD TRIP INFORMATION

FIELD TRIP 2 – CHARBOSS DEMO

THURSDAY, AUGUST 11, 2022

Times	Description
08:30 am – 12:00 pm	Field Trip B – CharBoss Demo (Morning)
01:00 pm – 05:00 pm	Field Trip B – CharBoss Demo (Afternoon)

** Please wear closed toe shoes and wear a mask on the van/bus to the site.*

WVU RESEARCH FOREST:

The West Virginia University Research Forest is located 10 miles northeast of Morgantown and encompasses an area of 7,600 acres. The forest cover consists of 80 to 100-year-old stands of mixed oak and mesophytic hardwood types. It has been managed for educational and research purposes and activities, including harvest effects on structure and development of Appalachian hardwood stands, nutrient cycling of forest ecosystem, landscape patterns on long-term forest management plans, deer management, oak regeneration, forest thinning practices, soil compaction, logging practices, and forest certification.

CHARBOSS:

The new Air Burners CharBoss® is based on the successful BurnBoss® unit - a small towable FireBox, which can be used for creating a marketable biochar product out of biomass/wood wastes, undesirable species and small diameter non-merchantable material in the Mid-Atlantic region to help reduce forest and biomass thinning costs and advance silvicultural objectives and forest stand development. The CharBoss is a new technology for making biochar. The designed new air curtain burners can turn piles of unmerchantable wood waste into biochar. It has the capability to separate charcoal from the burning biomass using a mobile through-put method, or conveyor belt, that expels the biochar from the burner and subsequently quenches it. It has fewer size and moisture content limitations than existing mobile biochar production machines, and it can consume material from most burn piles with minimal to no preparation. The new technology immediately quenches the coals to reduce the risk of fire and increase the rate of application or transport to another site.

For more information, please contact:

Dr. Jamie Schuler jamie.schuler@mail.wvu.edu; Dr. Jingxin Wang jxwang@wvu.edu;

Ms. Tina Metzger tmetzer@resourcedev.org

MASBio is led by West Virginia University and supported by the Agriculture and Food Research Initiative Competitive Grant No. 2020-68012-31881 from the USDA National Institute of Food and Agriculture.

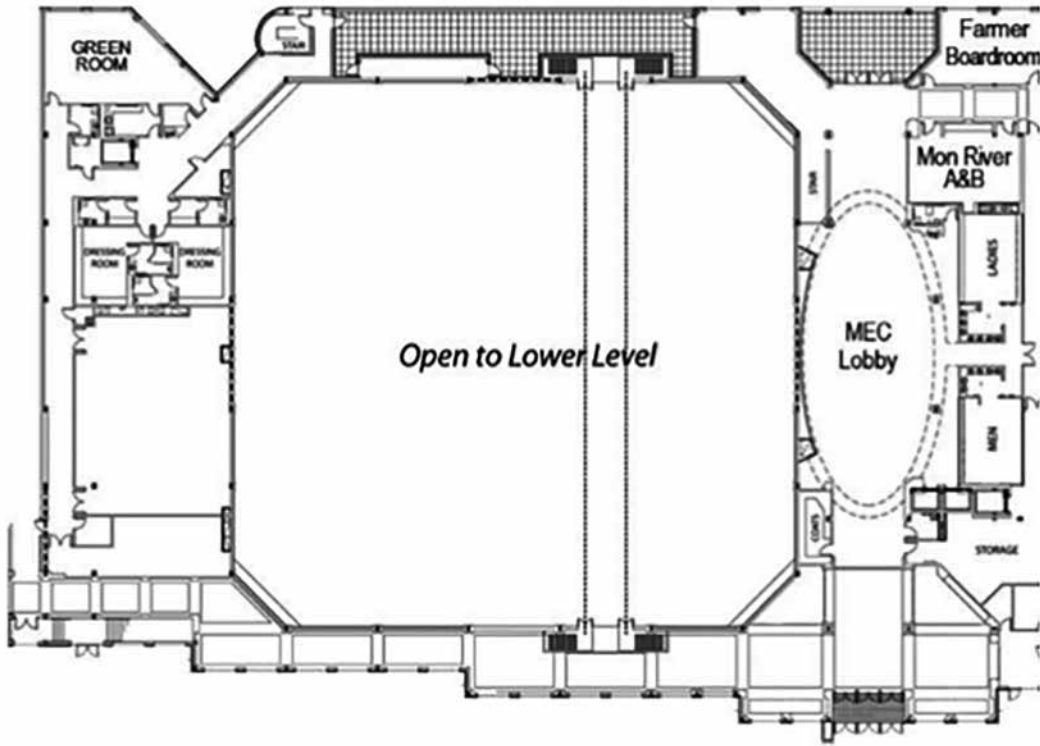


TECHNICAL POSTER PRESENTATIONS

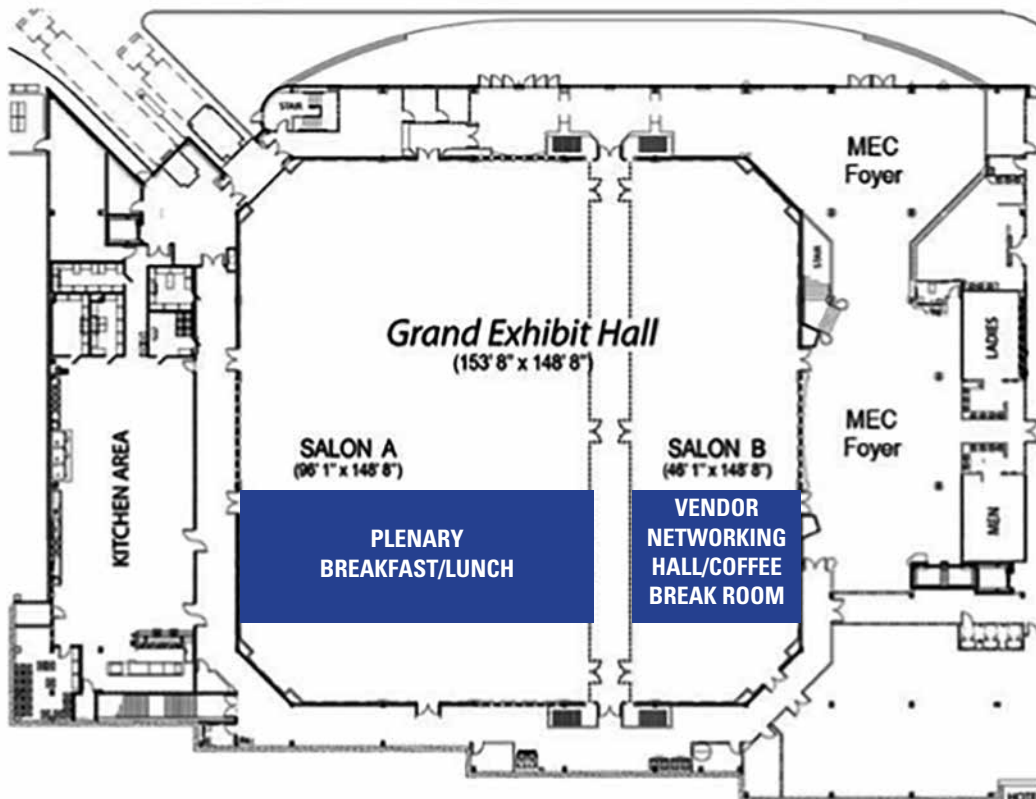
- #8 **Biochar Use in Electromagnetic Shielding**
Robert Gillett
Biochar Production and Commercialization
- #12 **Energy recovery and waste treatment using the co-pyrolysis of biomass waste and polymer**
Seokyoung Oh, Jung-In Sohn
Biochar Production and Commercialization
- #30 **Collaborative research with the community for the development of a basket of products from the pyrolysis of forest residues**
Marianne Lapointe, Maude Graham Sauv , R gis Pilote, Andr  Benoit
Biochar Production and Commercialization
- #53 **Regional Economic Impacts of Biochar Production in Central Valley, California**
Maryam Nematian
Biochar Production and Commercialization
- #60 **Machine learning applications in forest and biomass supply chain management**
Jinghan Zhao
Bioenergy and other value-added bioproducts, production and commercialization
- #63 **Development of Pilot Scale Pyrolysis Reactors for Biocarbon Sequestration**
Guillaume Gagnon-Caya, Benjamin Bronson, Murlidhar Gupta, Fernando Preto
Bioenergy and other value-added bioproducts, production and commercialization
- #3 **Financial Viability and Environmental Sustainability of producing Biochar from Fecal Sludge**
Jeff Hollowell, L. Stetson Rowles, Ph.D., Jeremy S. Guest
Carbon Markets & Circular Economies
- #67 **Charm Industrial: Putting Oil Back Underground**
Katie Holligan
Carbon Markets & Circular Economies
- #5 **Biomass as a carbon-negative energy source - a pilot scale wood-to-syngas and biochar study**
Anthony Tatum
Climate Smart Agriculture and Forestry
- #23 **Impact of Biochar Application on Regional Soil Properties**
Andrew Ellis, Robert Cantrell, Isabel Lima, Javier Gonzalez, Amir Hass
Climate Smart Agriculture and Forestry
- #94 **Long Term Soil Carbon Dynamics in Willow Biomass Crops**
Abigail Herrington
Climate Smart Agriculture and Forestry
- #58 **Identifying Barriers to and Opportunities for Adopting Biochar Production to Reduce Fire Risk and Improve Soil Health in Northern New Mexico**
Rosa Soriano, Tomasz Falkowski, Eva Stricker
Climate Smart Agriculture and Forestry
- #71 **Biochar use for ammonia reductions, moisture content, and composting of chicken broiler litter**
Lucas Knarr, Joe Moritz, Shawn Grushecky
Climate Smart Agriculture and Forestry
- #24 **Southern Yellow Pine Modified Biochar Efficacy in Removal of Selenium and Heavy Metals**
Devin Danford, Robert Cantrell, Isabel Lima, Javier Gonzalez, Amir Hass
Environmental Restoration and Remediation
- #25 **Greenhouse gas production from soil amended with biochar in bioenergy cropping systems**
Charlene Kelly
Environmental Restoration and Remediation
- #26 **A Test of a Hardwood Biochar Soil Amendment on Trees and Shrubs in Riparian Wetlands**
Andrew MacKenzie, Walter Veselka, Shawn Grushecky, James Anderson
Environmental Restoration and Remediation
- #35 **Assessing Soil Water Nitrate Concentrations Under Panicum virgatum (switchgrass) and Salix (willow) Crop Treatments in Marginally Productive Lands**
Bidisha Faruque Abesh, Jason Hubbart
Environmental Restoration and Remediation
- #36 **Use of Drones to Assess Forestry Best Management Practices**
William Smith, Bibek Arya, Jingxin Wang
Environmental Restoration and Remediation
- #105 **Carbon avoidance cost curves and economic multiplier effects of bio-based decarbonization strategies in the Northeast**
Mallory Wahlstrom
Carbon Markets & Circular Economies
- #59 **Life-cycle Economics and GHG-Emissions of Forest Biomass Utilization for Alternative Value-added Bioproducts in the Eastern U.S.**
Xufeng Zhang, Jingxin Wang
Bioenergy and other value-added bioproducts, production and commercialization

CONFERENCE FACILITY

CONFERENCE FACILITY UPPER FLOOR LAYOUT

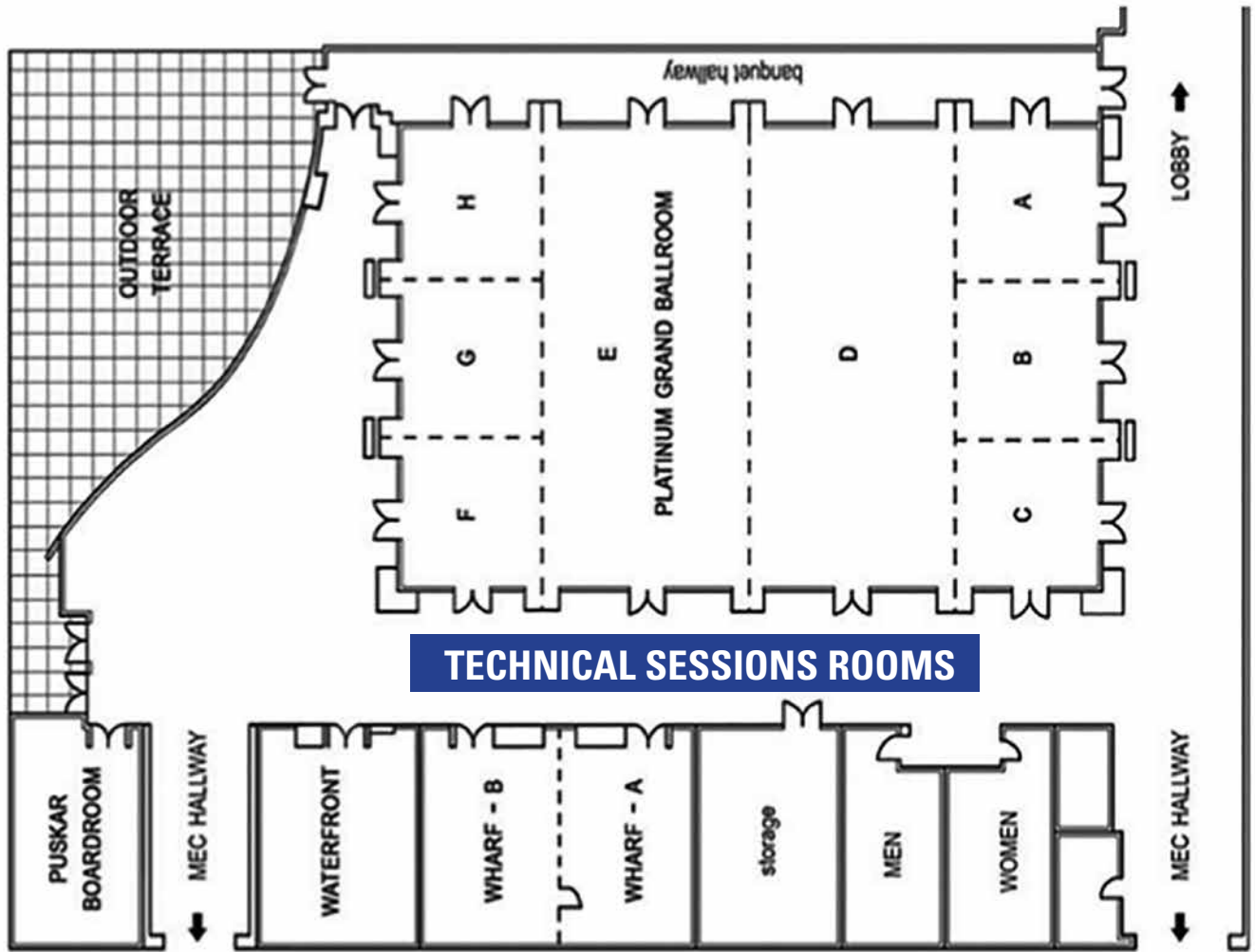


CONFERENCE FACILITY GROUND FLOOR LAYOUT



CONFERENCE FACILITY

CONFERENCE FACILITY TECHNICAL SESSIONS FLOOR LAYOUT



NOTES

Ring of Fire Kiln® from Wilson Biochar

The Ring of Fire makes Biochar

The Ring of Fire Kiln® is a metal container for converting waste wood and brush into biochar, a valuable soil amendment. The kiln consists of an inner ring composed of six sheets of mild steel that are bolted together. An outer ring of lighter gauge steel bolts onto the brackets that hold the inner ring together. The purpose of the outer ring is to serve as a heat shield that holds in heat for better efficiency. Total volume of the kiln is 5.6 cubic yards.



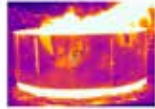
Biochar expert and consultant **Kelcie Wilson** is now offering the new and improved Ring of Fire Biochar Kiln for converting your waste wood into soil-building biochar.

The New Ring of Fire Kiln® features:

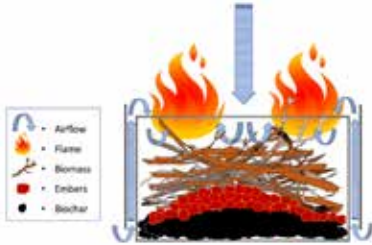
- Bigger capacity, better value 1.8 times more volume
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- Burns the smoke
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How the Ring of Fire Biochar Kiln® works:

- The outer heat shield holds in heat for a faster burn
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Contact Alan Peranson,
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alan@ecostrat.com



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USDA Forest Products Laboratory

You can help USBI build an industry to save the planet!



We count your financial contributions to expand our efforts.

USBI is a not-for-profit organization promoting the production and use of biochar in North America. Our expert volunteers donate their time to develop biochar education resources and organize high-caliber events. To increase our meaningful impact we need your funding, now.

As part of our team you can ensure that USBI continues to be a resource. Help us by funding programs like:

- Website Update
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Fund us when you shop by setting USBI as your charity on **<https://smile.Amazon.com>**

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